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# International Journal of Home Economics

Volume 10 Issue 1 2017

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INTERNATIONAL FEDERATION
FOR HOME ECONOMICS

EDITORIAL

# Ten years and a new design

Donna Pendergast
*Editor, IJHE*

We hope you enjoy the new design of the International Journal of Home Economics (IJHE). This is our tenth year of publication and we are proud to launch our new look to coincide with our second decade of publishing the only global journal that features the Home Economics profession.

This Issue of the IJHE comprises 17 papers, 16 of which are Research Articles and one Review Article. Some of these papers began their review process as Peer Reviewed Papers presented at the XX111 IFHE World Congress held in Korea in August 2016 which had the theme of *Hope & Happiness: The role of Home Economics in the pursuit of hope & happiness for individuals and communities now and in the future*. Hence, there is a strong theme of hope and happiness running through some papers published in this Issue.

The IJHE provides wide exposure for these publications with the IJHE now available without password access on the International Federation for Home Economics (IFHE) website as well as being distributed through the Informit database and EBSCO's research collections. Theoretical papers, literature reviews, and a wide range of genres along with research papers are invited for publication in the journal.

The aim of IFHE is to achieve the highest quality in this e-journal. To realize that goal, there is a need to continue to refine and develop our processes. The IJHE requires a prominent international editorial board along with high quality submissions, a thorough and comprehensive review process, and a fine, high quality finish. To that end we are seeking to increase our Editorial Board Membership. In the last ten years, the Journal has achieved the following:

- 258 papers have been submitted for peer review by a total of 388 different authors
- 155 papers have achieved publication status
- 39 different nationalities are represented by the range of authors
- 2 498 pages and 877 947 words have been published.

The editorial board to date has worked extraordinarily hard to achieve this, alongside the authors and researcher who submit their papers. Some editorial board members have volunteered their professionalism for the entire 10 years the IJHE has been publishing. The following is a summary of editorial board membership. There has been:

- 1 editor and 1 editorial administrator (formatter, graphic designer, administrative support)
- 24 Editorial Board members (11 current)

Editor: Donna Pendergast ✉ intjournalhomeeconomics@gmail.com

Given the growth in the IJHE and the need for high quality reviewers, I invite you to submit an Expression of Interest for Membership of the IJHE Editorial Board. Please provide a brief Resume providing the following information: qualifications; professional employment experience; publications record; editorial board experience; IFHE region membership; home economics fields of expertise. Please ensure the Criteria for Board Membership listed below are met prior to submitting your application to avoid disappointment. A maximum of 5 pages is required, submitted to: intjournalhomeeconomics@gmail.com

## Criteria for editorial board membership

- Must be a productive and respected researcher with expertise in one or more research methodologies and one or more Home Economics specialisations.
- Must have a background in research including academic preparation (minimum doctoral degree) and have published in refereed journals.
- Must have current membership of IFHE or willingness to join during tenure on the Editorial Board.

Professor Donna Pendergast, PhD

INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# Service Learning within Communities of Practice

Kendra Brandes
*Bradley University, USA*

## Abstract

*With increasing emphasis upon structuring the learning associated with service, identification of appropriate models is needed. Developing service learning within the context of Communities of Practice expands the opportunities for programs that meet the needs of students and the communities they serve. A service learning project focused on designing insulin pump packs for children serves as the model for incorporating service learning and communities of practice into the curriculum. The collaborative efforts of representatives from education, health care, and industry deal with one aspect of a multi-dimensional problem—giving children choices regarding the physical appearance of medical equipment and supplies.*

**KEYWORDS: SERVICE LEARNING, COMMUNITIES OF PRACTICE, TYPE 1 DIABETES, INSULIN PUMPS**

## Introduction

The profession of Home Economics is based upon solving real life problems with the goal of serving individuals, families, and communities. The ideal curriculum for preparing students to find creative ways to address problems is one that seeks solutions from multiple disciplines and connects the student to the populations served. Service learning is one form of learning that helps students make these connections. Developing a service learning project within a Community of Practice provides connections far beyond the typical service learning project.

## Review of literature

### Service Learning and Communities of Practice

As defined by the National Service-Learning Clearing House (n.d.), "Service-learning is a teaching and learning strategy that integrates meaningful community service with instruction and reflection to enrich the learning experience, teach civic responsibility, and strengthen communities." Bringle and Hatcher (1999) include the processes of structure, feedback, and values clarification as necessary components for a positive learning experience. However, steps must be taken to ensure that students step outside of their own fields of study to consider solutions to problems. Comprehensive definitions of service learning should include interdisciplinary components. What would such a model look like?

To bring interdisciplinary, or even transdisciplinary components to a service learning project students must work closely with representatives from other fields. Communities of Practice offer such an opportunity. The term *Communities of Practice* (CoP) is a fairly recent title for a format of learning

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that is as old as learning itself. The term is defined as "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly." (Wenger-Trayner & Wenger-Trayner, 2015.) CoPs differ from interest groups or project teams. They are ongoing affiliations of practitioners who seek to distribute knowledge and build networks based on a common interest (Wenger, McDermott, & Snyder, 2002).

Kimble and Hildreth (2004) trace the evolution of the Community of Practice concept from earlier attempts in the business setting to create knowledge in increasingly competitive and global environments. In the 1980s the term *Knowledge Management* was used to describe efforts to capture knowledge or information that already existed in structured rules and procedures. New knowledge was developed in a formal organisational setting by groups of people who were brought together to complete a specific task. The structure of the group reflected the structure of the business or organisation. Hildreth, Kimble, and Wright (1998) described this type of knowledge as "hard" knowledge. However, Kimble and Hildreth identified "a growing awareness that knowledge is not found in rules, frames, cases, predicate logic or document repositories but that other factors were at work. This inevitably raises questions about what these other factors are and how this new softer form of knowledge might be managed". (2004). These "other factors" were described by Lave and Wenger (1991) as they explored learning that took place in apprenticeship situations. They coined the term *Community of Practice* to describe knowledge acquisition that took place as a result of social interaction rather than efforts structured solely by fact finding. The concept of CoPs developed around self-directed and self-managed groups of individuals with a high level of interest in a problem or task. In a CoP, knowledge is not merely "handed-off, but rather co-constructed" as work on a problem progresses (Hoadley, 2012, p. 288). Learning happens within the context of the problem at hand rather than merely transmitting previously established facts. Wenger et al. (2002) discuss the concept of *aliveness* within Communities of Practice. This quality differs from traditional organisational formats that rely upon more well-defined structures and systems. It is a product of the attitudes, values and culture of each individual within the group. It is more similar to lifelong learning than to traditional project groups. CoPs often have fewer structural elements at the formation of a group because the initial purpose is to explore and share.

The structure of CoPs raises some questions about their effectiveness within business. Groups that are self-managed and self-directed may be too autonomous to be effective in a business setting (Hislop, 2004; Kimble & Hildreth, 2004; Vaast, 2004). CoPs in education face similar issues related to structure and effectiveness (McLaughlin & Talbert, 2006). How will communities be created—voluntarily or assigned? How will members manage boundaries between the community and the formal structure of the school? How can such an autonomous group relate to established learning outcomes? A very helpful contribution to the literature is the work of Jakovljevic, Buckley, and Bushney (2013) which offers a review of learning theories related to CoPs. Based on this review the authors developed a set of 15 criteria to be used as the framework for a CoP model in education.

Wenger-Trayner and Wenger-Trayner (2015) identify three areas that characterise a Community of Practice. First is the domain. Members of a Community of Practice share an interest in a particular topic, or in this case, a particular issue or problem. Second is the community. This group of people with a shared interest interacts and learns from one another. This may take place through formal meetings or informal communication, but there is a passion to explore aspects of a topic or issue. The third characteristic is the practice. The group is not merely an interest group, but rather a group of people actively engaged in activities related to the topic. They are practitioners working together to seek solutions or answers. Members may be from different fields or backgrounds, but they share a common interest and need to learn.

Communities of Practice are most often informal groups and may be found in education, business, civic groups, government, or other formats. They may have a formal structure or may be so informal that they are not even recognised as a group. The identifying characteristic is that members learn from one another and contribute to the learning. Service learning structured within a Community of Practice presents a model for learning that allows students to examine issues or problems from multiple disciplines and perspectives and provides multiple opportunities for classroom/community connection. Wenger-Trayner and Wenger-Trayner state

> The perspective of communities of practice affects educational practices along three dimensions:

- Internally: How to organise educational experiences that ground school learning in practice through participation in communities around subject matters?
- Externally: How to connect the experience of students to actual practice through peripheral forms of participation in broader communities beyond the walls of the school?
- Over the lifetime of students: How to serve the lifelong learning needs of students by organising communities of practice focused on topics of continuing interest to students beyond the initial schooling period?
  (Wenger-Trayner & Wenger-Trayner, 2015)

These practices parallel the goals of many service learning activities and offer a conceptual framework within which to structure a service learning program.

**Learning outcomes**

Service learning projects structured within communities of practice must still be based on learning outcomes. Blooms Taxonomy of Learning Objectives (Anderson & Krathwohl, 2001; Bloom, 1956) has long been a corner stone for identifying educational goals and outcomes. While the most frequently used component of Blooms Taxonomy has been the cognitive domain, this taxonomy also includes components for the affective domain which presents essential elements for any well-structured learning activity.

More recently, Fink (2003) proposed a taxonomy for significant learning that provides a structured way of thinking about the learning outcomes that are possible when engaging students in learning activities that span multiple areas. Fink acknowledges that his taxonomy is based upon concepts and practices already well established in the literature. The value of Finks work is to propose a "language" of learning outcomes that teachers will find useful as an increasing number of courses incorporate activities that take the student beyond the classroom and the traditional lecture format. Fink's concepts for learning outcomes are interactive rather than hierarchical. (Figure 1) The more that can be included in a single learning project, the better. This taxonomy can be useful when planning learning activities that are multidimensional.

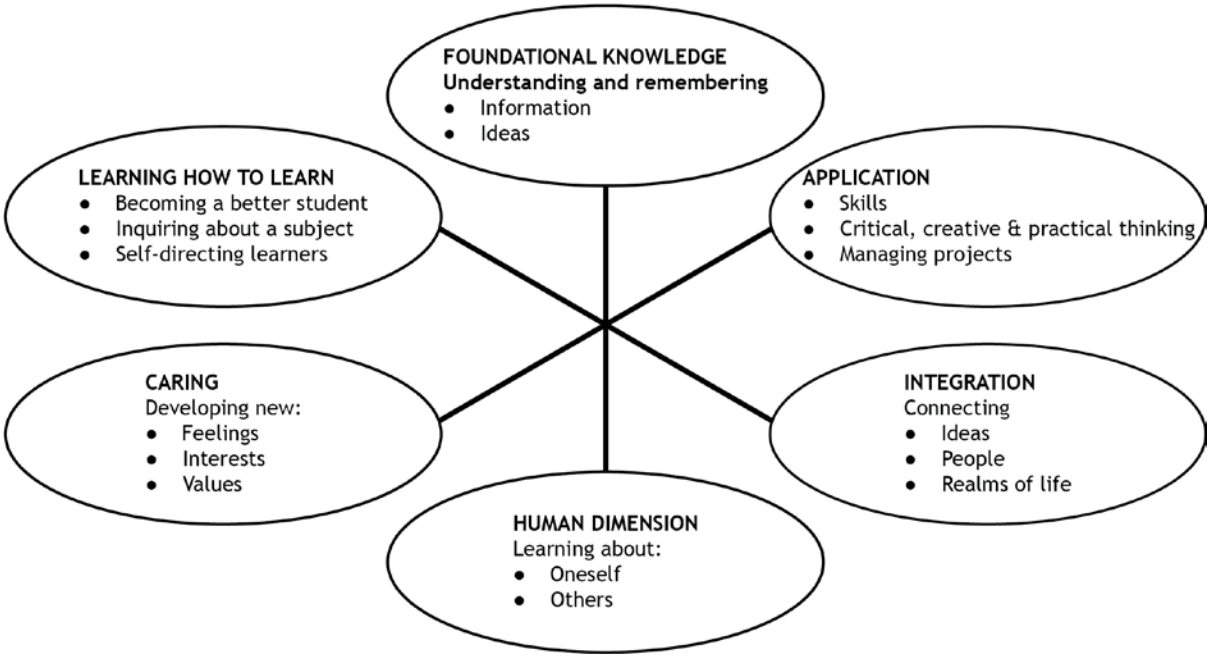


**Figure 1 Finks Taxonomy of Significant Learning**

*Note.* Adapted from Fink (2003).

## Type 1 Diabetes—A complex global issue

One example of a problem affecting individuals, families, and communities is the rising number of cases of Type 1 diabetes. Type 1diabetes, previously called juvenile diabetes, or insulin dependent diabetes, is the result of the body's inability to produce enough insulin to regulate blood sugar. Left untreated, the disease causes a multitude of other health issues and can lead to death. The number of cases of Type 1 diabetes in children from birth to age fifteen is increasing in countries around the globe (Casu, Pascutto, Bernardinelli, Sardinian IDDM Epidemiology Study Group, & Songini, 2004; Gebel, 2008). It is reported that "Type 1 diabetes incidence has been rising by a yearly average of 3% worldwide and 3.2% in Europe with a higher rate of increase among children under the age of five" (Casu et al., 2004). The highest incidence rates are found in Finland, Sweden and Kuwait. (International Diabetes Federation, 2015). Other parts of the world, like China and Venezuela, exhibit the lowest rate of increase (Daneman, 2006). Reasons for the acceleration of this disease are not clear, but the needs created by the condition are universal.

### Type 1 Diabetes and the family.

"… coalescing of disciplinary knowledge is essential because the phenomena and challenges of everyday life are not typically one-dimensional" (International Federation of Home Economics, 2008). The diagnosis of Type 1 diabetes embodies the essence of this statement, requiring support for families from a network of resources. Immediate treatment requires the expertise of professionals in medicine and dietetics. However, dealing with this disease is not simply a medical/dietetic issue. A diagnosis of diabetes results in major life style changes for the individual, the family, and for the community. The impact is felt more acutely when a young child is diagnosed. The entire family must learn about and live with new restrictions and routines. Beyond the medical and dietary issues facing children with this diagnosis are issues of self-image and peer acceptance. While diabetes manifests few, if any, visible characteristics, the necessary equipment and supplies become an ever present part of the child's life. This project describes the collaborative efforts of representatives from the fields of education, health care, and industry to deal with one aspect of this multi-dimensional problem—giving children choices regarding the physical appearance of medical equipment and supplies.

### The scope of the problem

Daily routines for children with diabetes and their families are filled with details related to measuring blood sugar levels, counting carbohydrate content of all food and drink consumed, and planning activity levels—all day, every day. However, managing Type 1 diabetes quickly crosses disciplines and becomes multi-dimensional when issues of self-image, family relationships, and interaction with community members are considered. Family relationships are strained any time a member must deal with disease management. Adolescents with Type 1 diabetes reported the simple tasks of getting up in the morning, meal times, and watching television as activities that were most difficult to coordinate with tasks related to diabetes management (Crawford, Dashiff, Kimbrel, Long, & Viikinsalo, 2005). These may be stress points for any family with adolescent children, but the parent-child stress levels escalate when the child's state of health depends upon maintaining a strict regimen.

To maintain healthy blood sugar levels, individuals with diabetes must carry supplies with them at all times: lancets for drawing blood for testing, meters for measuring blood sugar content, insulin and syringes, juice or foods to ward off low blood sugar, carbohydrate logs and other supplies. Advances in medical technology have provided many individuals with diabetes with insulin pumps, which allow a port for insulin injection directly into the body without having to use a syringe. While the needle must be inserted into a different site on the body after a few days, it does help regulate the insulin input and reduce the number of injections required with a syringe. The pumps are worn in a case (or pack) that holds the pump next to the body. Wearing a pump and carrying a *low kit*, or supply bag gives visibility to the disease. Children spend up to one-third of their day in school where teachers and peers may have limited understanding of the child's needs. Individuals working with this project reported, only a few years ago, incidences of children being reprimanded for wearing cell phones into the classroom because the insulin pump, in its black case, appeared so similar to a cell phone. While cell phones and other electronic devices have become more common place, the necessity of wearing an insulin pump presents unique issues related to self-image. It is not a choice, but a device that is worn twenty-four hours a day. The need for more creative pump packs and

accessories is evident by new products appearing on the market. One product designer describes the relationship of apparel and accessories to self-concept. "By turning a medical device into a fashion accessory, the designs alleviate anxiety, create dynamic communities, and encourage new relationships with medical technology" (Floeh, n.d.).

In addition to the medical issues involved, a diagnosis of Type 1 diabetes presents challenges dealing with nutrition, clothing, human growth and development, and family relationships. The field of Home Economics is uniquely structured to offer solutions to this multidimensional issue facing so many families.

## The Pump Pack Project within a Community of Practice

### The Domain

A service learning project structured within a Community of Practice began without the participants knowing how the structure of the project would eventually take shape. A collaborative project began in 2006 when a diabetic educator, employed by an insulin pump manufacturer, contacted Family and Consumer Sciences (FCS) faculty at a university in the Midwestern region of the United States with the request to work together to design pump packs for children. The diabetic educator hoped to meet the need for children wearing pump packs to have control of the appearance and design of the pack. This initial contact evolved into a Community of Practice consisting of members representing the health care field, industry, university faculty and students, and members of the local community. (see Figure 2).

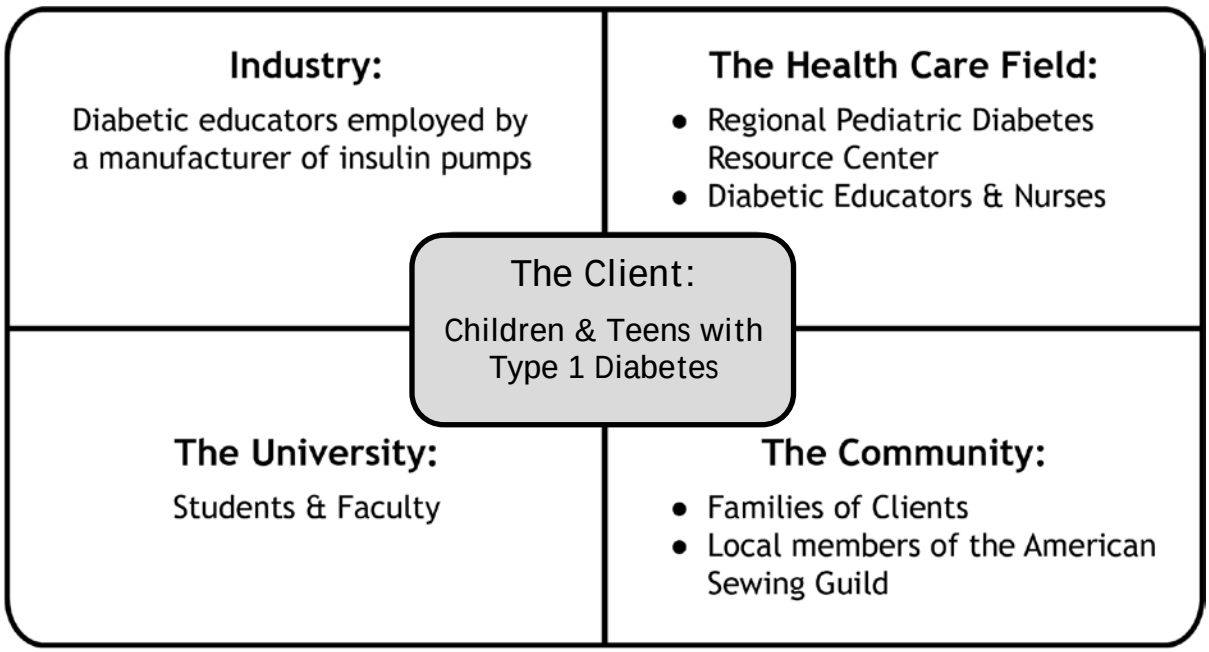


**Figure 2 Community of Practice members**

The *Pump Pack Project* was structured as a one-hour credit elective course. There were no prerequisites. The primary objective of the course was to offer children with Type I diabetes the opportunity to work with a university student to design their own pump pack (case for carrying an insulin pump close to the body) or low kit (a supply bag for diabetic supplies). The components of the project are outlined in Table 1 and are aligned with components of Fink's Taxonomy of Significant Learning. The faculty encouraged students from all majors of the FCS program in the department to participate.

**Table 1 Components of the Service Learning Project**

| Project Steps | Activities Undertaken | Fink's Components of Significant Learning |
|---|---|---|
| Identify needs/establish goals | A diabetic educator recognised the need for more child-friendly pump packs | Integration—connecting ideas, people, and realms of life |
| Identify interested parties | • Children and teens wearing insulin pumps<br>• University students and faculty<br>• Members of industry<br>• Members of the health care field | Integration—connecting ideas, people, and realms of life |
| Identify values | To provide children wearing insulin pumps the opportunity for self-expression & creativity | Integration—connecting ideas, people, and realms of life |
| Identify resources | • Expertise of CoP members<br>• Event locations on campus and in the community<br>• Avenues for contacting families<br>• Sample supplies for creating templates<br>• Funding for materials<br>• Other | Application—developing skills; critical, creative thinking & practical thinking; managing projects<br>Learning how to learn—Becoming a better student, inquiring about a subject, self-directing learning |
| Plan project | • Team members meet & plan class<br>• Students learn about diabetes, diabetic supplies, and product development<br>• Meet with clients—the children who will wear the pump packs | Foundational knowledge—understanding and remembering information and ideas<br>Application—developing skills; critical, creative thinking & practical thinking; managing projects<br>Human Dimension—learning about one's self and others |
| Implement | • Students design & create products<br>• Pump packs are presented during a fashion show | Application—developing skills; critical, creative thinking & practical thinking; managing projects |
| Evaluate | Students write reflections regarding multiple aspects of the project. | Human Dimension—learning about one's self and others<br>Caring—developing new feelings, interests, values |

A custom design was created based on the needs of each child in terms of equipment or supplies required, age and activity level, and aesthetic preferences. For example, a three-year-old boy who loved Spiderman and turning summersaults needed a pack for an insulin pump that would stay in place during his active day. A high school aged girl required a pack within her softball uniform that would not be torn loose as she pitched. It had to be in the team colours and have a clear window for quick viewing of the readout on the pump. Another young girl wanted pyjama pants with an interior pump pack and a matching scarf for her service dog. All needs were considered.

## The practice

The many aspects of learning throughout the project were shared between members of the community of practice. Students majoring in retail merchandising had experience with fabric selection and sewing techniques. They assisted students from other majors as each student learned the necessary skills to design and construct the product. Students majoring in dietetics presented information about diabetes and dietary requirements. Students majoring in other fields contributed their own areas of expertise. Educators and nurses from the regional Pediatric Diabetes Resource Center attended the class on their own time and provided more in-depth information about the needs of the children and their families. They sat at sewing machines and learned steps of product construction from the students. A volunteer from a local chapter of the American Sewing Guild joined the group and helped with sewing techniques and product design. The project quickly developed a structure that was not foreseen when it began. Each member contributed knowledge and learned from other members. Involvement was not limited to the duration one semester. The relationships formed between members of this Community of Practice have continued to grow. The class has, to date, been offered three times.

## The community

Wenger-Trayner and Wenger-Trayner (2015) state that "members of a Community of Practice are practitioners. They develop a shared repertoire of resources: experiences, stories, tools, ways of addressing recurring problems—in short, a shared practice." Each member of this pump pack CoP brought specific knowledge and skills to the group. Each member expanded their area of expertise as they worked together to solve a common problem.

University faculty and students were very interested in applying discipline specific knowledge and skills to a very real problem identified by university alumni working in the industry. Parents of children with Type 1 diabetes actively participated by bring their children to the "meet and greet" event, and by discussing their family's situation with the university students. As relationships between the Community of Practice members strengthened, family members participated further by speaking to professionals at a state conference of Family and Consumer Sciences.

Diabetic educators from the Pediatric Diabetic Resource Center were instrumental in locating families with children diagnosed with Type 1 diabetes. University students and faculty planned a "Meet and Greet" event where each student was paired with a child to discuss the type of product (pump pack or low kit) desired. The children participating had the opportunity to design their product in terms of colour, embellishments, type of fasteners, and so on. Each product was custom designed for the child. Table 2 illustrates the variety of product designs.

**Table 2** **Selected product descriptions**

| Child | Age | Item to make | Themes/colours/preferences |
|---|---|---|---|
| Boy | 13 | Pajama pants with pocket/pack inside | Chicago Bulls or Bears |
| Boy | 7 | Pajama pants with pocket/pack inside | Lego Man, Batman, Indiana Jones characters<br>Likes purple or black skulls |
| Girl | 15 | Athletic pant with inside pockets on both sides. Must have clear window for easy reading of meter and openings for tubing. | Black with red stripe—no prints |
| Boy | 5 | Pump pack on wide elastic waistband. Must stay in place during active play. | Ironman, Cosmo, Sponge Bob, holiday theme |
| Boy | 9 | Belt pack low kit w/belt clips & waistband. Must be able to be worn on belt, or clip to belt loops. | Wants orange. Also likes black, blue, red, green. Likes old Tom and Jerry cartoons |
| Girl | 12 | Zippered bag for testing supplies (low kit)<br>Insulated pouch for insulin; phone pocket; outside pouch for glucose tabs; sharps pouch; place for garbage; short strap and long strap | Vera Bradley quilted prints. Favourite colours are blue, green, white, purple |
| Girl | 9 | Shoulder strap low kit. Will carry:<br>meter, sharps, water bottle, snack. Wants phone pocket,<br>Does NOT carry insulin with her | Rainbow colors<br>First name embroidered on one side<br>Likes buttons<br>Small ruffles in a few places |
| Girl | 9 | Pajama pants with meter case inside. Wants matching scarf for service dog (14-inch neck)<br>See detailed drawing | Transformer theme |
| Girl | 10 | Pump pack.<br>With clear window on waist band | Lime green with silver sparkles<br>Plays soccer, so must be very snug |
| Boy | 14 | Pump pack on arm band. Opening for correct placement of tubing. | Is involved in martial arts. Pack must be worn on arm so that it is not displaced during high kicks. |

Educators from the Pediatric Diabetic Resource Center and from the insulin pump manufacturer provided samples of supplies (insulin pens, meters, pumps, syringes, etc.) to aid in the design of three-dimensional templates needed for designing the interior of the pack or supply bag. Attention was given to keeping items secure, within easy reach, at the right temperature, and other aspects of equipment storage and protection.

## Discussion

While learning outcomes were not measured quantitatively, student discussion and reflection indicated growth in areas identified by Fink as significant learning. Table 3 offers quotes from students to illustrate this point.

**Table 3 Student quotes related to selected components of Finks Taxonomy of Significant Learning**

| Finks Dimension of Significant Learning | | |
|---|---|---|
| **Caring:** Developing new feelings, interests, values | **Integration:** Connecting ideas, people, realms of life | **Human Dimensions:** Learning about oneself and others |
| I helped bring a smile to a child's face. I learned more about diabetes, so I will have a better understanding when dealing with anyone with that health issue. I hope to have made that family's life just a little bit easier. | This project helped me better understand how a disease can affect what you have to wear and how efficient your clothes have to be. | I learned that there are so many good people out there who are willing to help one another. I learned more about diabetes and what the individuals and their families are going through. |
| Firstly, we provided the children and their families with supplies that will brighten their lives, contribute to their individuality, and help them manage their day to day tasks. Secondly, we provided the community (which ended up reaching beyond the class room) with a heightened sense of awareness of diabetes and how it affects those who have it. Lastly, we delivered a message to all those who participated: we care. | Though we all are concentrated in different areas, we all have the same drive and purpose at the core: helping and bettering the lives of others. I believe that this concept is what makes FCS such a special department: individually, each major has the ability to influence the world and the lives of people, but, if we bring all the concentrations together in collaboration with one another, the knowledge of each field can be combined and serve a much more brilliant, broad purpose. | I feel a deeper compassion for the children we served (as well as those we did not), as well as a greater respect for their ability to play, laugh, and live considering all the restrictions created by their disease and the technology they must lug around. Finally, I have developed an appreciation for team work. |

In each of the semesters during which this project was offered, students seemed most engaged in non-discipline specific aspects of their involvement. Collaborating with those from other disciplines elevated the understanding of the problem beyond that provided from the perspective of a single discipline. For example, dietetic students reported a greater appreciation for the importance of product design. Retail merchandising students reported a more encompassing view of fashion self-expression as it related to medical devices. Education students gained an appreciation of educational needs of community members outside of the traditional classroom.

Looking at discipline specific learning outcomes fails to allow the acknowledgement of learning that takes place when addressing multidimensional issues. Learning that takes place in Fink's dimensions of caring or in the human dimension is difficult to measure but cannot be ignored. Finks taxonomy provides a structure to give due importance to these areas of student growth.

While CoPs formed strictly within the confines of a single industry, organisation, or educational setting may encounter challenges related to structure or autonomy, it the collaborative effort of members from across a variety of settings that allow Communities of Practice to fully thrive. Within this case study, members of industry, health care, education, and community organisations encountered learning practices enhanced by the *aliveness* that characterises such an undertaking. Each member stepped outside the boundaries of their specialised fields and into a community of individuals with a shared interest. Each member brought his or her own values, beliefs, and professional practices to focus on the problem at hand. It became a transdisciplinary approach as the elements unique to each field cross pollinated and created solutions that grew from the cultural practices of this particular group.

Working within Communities of Practice provides the framework for students to step beyond their own areas of expertise and apply the collective efforts of many to solve problems facing individuals, families, and communities. This service-learning within a Community of Practice contributed to the "coalescing of disciplinary knowledge" (Home Economics in the 21st Century) and a greater understanding of the true mission of Home Economics.

## Biography

Kendra Brandes, EdD, is an associate professor in the department of Family & Consumer Sciences at Bradley University in Peoria, Illinois, U.S.A. Kendra's research interests include practices for incorporating service learning into the Home Economics curriculum. She currently serves as president of a regional Home Economics foundation, as a board member for the Illinois Association of Family and Consumer Sciences, as a national level board member of Kappa Omicron Nu honor society.

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# Teachers' hopes for the future of Home Economics education in New Zealand

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## Abstract

*This article describes a qualitative study that was conducted to explore six teachers' perspectives of future directions for Home Economics education in New Zealand. The study found that teachers held hope in terms of learning outcomes of the subject for students, hope for challenging others' misconceptions and limiting perceptions of the subject, and hope for the future of the subject in New Zealand schools. Implications of the study focused predominantly on the need for advocacy and collaborative actions in order to future-proof Home Economics education in New Zealand.*

**KEYWORDS: HOPE, ADVOCACY, WELL-BEING, LEARNING, TEACHERS**

## Introduction

In the New Zealand Curriculum (Ministry of Education, 2007), Home Economics is one of three subjects in the Health and Physical Education (HPE) learning area alongside health education and physical education. The three subjects share common achievement objectives and a conceptual framework. If selected by senior secondary students, these subjects can contribute to National Certificate in Educational Achievement (NCEA). The NCEA is a standards-based national qualification system based on internally and externally assessed units of learning (Achievement Standards) at three levels, corresponding to the final three years of schooling in New Zealand (NZQA, n.d.).

Within HPE, Home Economics is limited to food and nutrition. Food and nutrition is described as a 'key area of learning' in HPE that explores factors that influence the well-being of individuals, families and communities (Ministry of Education, 2007). The practical component of the subject involves not only the processes of selecting, preparing, cooking and serving food (Ministry of Education, 2007) but may also involve opportunities to engage in health promoting actions in the school and/or local community.

Learning in HPE is underpinned by four interdependent underlying concepts: Hauora and well-being, attitudes and values, the socio-ecological perspective and health promotion. Hauora is a Māori concept of well-being, comprising *taha tinana* (physical), *taha whānau* (social), *taha hinengaro* (mental and emotional) and *taha wairua* (spiritual) (Ministry of Education, 1999). Through the context of food and nutrition, students studying in Home Economics apply the understandings of the underlying concepts within their learning in order to reflect on the nature of well-being and how to promote lifelong well-being (Ministry of Education, 2007) for self, families and wider communities.

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Despite contributions that Home Economics can make to the NCEA, there remains some perception that Home Economics is not as academic as other subjects, which is an ongoing challenge faced by Home Economics teachers in New Zealand. Home economics, however, is a popular subject with students, who value the opportunities to engage in both practical and theoretical learning activities (Hipkins, Conner, & Neill, 2005; Street, 2006). Challenges facing Home Economics in New Zealand are echoed in the international literature, including not only the problem of low status described above but gender bias (Dewhurst & Pendergast, 2008; Pendergast, 2001) and fragmentation. The latter relates to the different ways in which Home Economics is conceived across international curricula, diverse names for the subject and a shortage of teachers trained specifically in Home Economics (McGregor, 2014; Pendergast, 2001). Another significant issue within the profession is that the baby boomer generation, a demographic approaching retirement, is currently dominating the profession (McGregor, 2015; Pendergast, 2009). One further issue facing Home Economics in New Zealand (which may also be an international issue) is the belief by many that HPE is a space for fighting childhood obesity (and other public health issues). This perception manifests with many external providers and interest groups becoming involved in planning and delivering learning experiences in HPE (Leahy, Burrows, McCuaig, Wright, & Penney, 2016; Petrie, Penney, & Fellows, 2014; Powell & Gard, 2015). This trend has the potential to disempower Home Economics teachers and to erode the intent of HPE and the wider curriculum.

This paper examines how hope can be used to frame how teachers of Home Economics education in New Zealand might see a way through the issues and challenges currently facing the subject and the profession in the country.

The International Federation of Home Economics (IFHE) released the *World Congress 2016 Resolution Statement* indicating support for the pursuit of hope. In the resolution, hope is described as having the potential to "harness curiosity, resilience, relentlessness, inventiveness and ingenuity so that the future can be improved, not at the expense of others, but alongside others, to achieve health, well-being and sustainable living" (IFHE, 2016, p. 1). This statement resonates with the intent of Home Economics education as guided by *The New Zealand Curriculum* (Ministry of Education, 2007), a secondary school subject underpinned by the concept of well-being and taught with pedagogies that foster learners' curiosity, resilience, and interest in lifelong learning and sustainable development (Ministry of Education, 2007).

Home economics teachers in New Zealand recognise that the subject and profession face challenges that require action, such as future teacher supply and others' limiting perceptions of Home Economics as 'cooking and sewing' (Pendergast, 2001; Street, 2006). In spite of these challenges, teachers in New Zealand firmly believe that the subject offers opportunities for students to engage in meaningful future-focused learning with the hope that students will take from their Home Economics learning an understanding of social justice, health promotion and the actions needed for the well-being of individuals, groups and societies. Hope is an important attribute for a teacher to possess. According to Freire (1994, p. 9), "one of the tasks of the progressive educator… is to unveil opportunities for hope, no matter what the obstacles may be. After all, without hope there is little we can do." Giroux (1997) expands upon this when he stresses the need in education for a language of transformation and hope. He writes that educators need to "provide spaces both in and out of schools that offer new opportunities for social movements to come together" (p. 227). Against the landscape of the aforementioned challenges within Home Economics, it is pertinent for teachers to be hopeful in the ways described by Freire and Giroux.

The concept of hope has been theorised within such disciplines as psychiatry, psychology, theology, medicine and philosophy (Levine, 2013). Hope is generally seen as a positive force, particularly in contemporary times (Jacobs, 2005). However, in the past, it has been seen as a tool for governing people by being intertwined with fear (Dahlbeck, 2014) or (drawing on thinking from Sophocles and Nietzsche) an illusion that caused more harm than good (Snyder, 1995).

Lopez, Snyder and Pedrotti (2003) group theories of hope into two categories, emotional and cognitive. The work of psychologist Charles Snyder has been influential in contemporary research into hope. Snyder's hope theory assumes that people are directed towards achieving goals in life and that two components are required when striving for future goals. Firstly, willpower (agency) and secondly, perceived ability to get where one is aiming to go (pathway) (Snyder, 1995). Hope is accordingly defined by Snyder, Irving and Anderson (1991) as "a positive motivational state that is based on an inter-actively derived sense of successful (a) agency (goal-directed energy), and (b)

pathways (planning to meet goals)" (p. 287). While this may seem on the surface to be a purely individual process, theorists including Snyder have written extensively about the social construction of hope, or the way that hope "is wrapped up in the web of social relations that each of us inhabits" (Jacobs, 2005, p. 785). Indeed, from a future-focused point of view, the notion of collective hope as being empowering and potentially revolutionary (Snyder & Feldman, 2000) is critical, given that we live in a complex, uncertain, culturally-diverse, globalised and dynamic 21st century (Hipkins, Bolstad, Boyd, & McDowall, 2014; UNESCO, 2017).

Snyder's hope theory is useful for the present research for several reasons. As a teacher, hope is an essential part of practice. Teachers hope to be able to make a difference in young people's lives and to instil in their learners a thirst for hope in their lives—the importance of which is captured by Snyder (2000) when he states that "by learning to hope, today's generation is equipped to grapple with tomorrow's adventures" (p. 25). Following Freire (1994) and Giroux (1997), in the *Handbook of Hope*, Snyder and Feldman (2000) discuss the idea of hope as an empowering social agenda, an idea that resonates with the present research. The authors preface the chapter with the assertion that empowering hope for shared future goals is needed for the common good, an idea that appeals to the sustainability aspect of Home Economics in New Zealand and the IFHE World Congress Resolution Statement (IFHE, 2016). Snyder and Feldman go on to assert the need for learning experiences in schools that are tied to relationships, communication and the important role of the family—again, ideas pertinent to Home Economics. Finally, the authors postulate that "there is a strength that comes from knowing that one is part of a community" (Snyder & Feldman, 2000, p. 402), and control over one's work situation is essential to meet work-related goals, which relates to the teaching profession.

While a literature search on the concept of hope bears plentiful results, less research appears to have investigated how concepts of hope can be applied in educational settings for teachers and/or learners. Several studies have been conducted with pre-service and in-service teachers in the USA in recent years in relation to hopes and fears (Hong & Greene, 2011); the call to teach and teacher hopefulness (Bullough & Hall-Kenyon, 2011); and the sustaining power of hope (Levine, 2013). The three studies used questionnaires to measure teachers' levels of hope and found that the participants held a high degree of hope that they would (or do) make a difference as teachers and that they believed that they were called to teach. Levine (2013) found that in-service teachers' motivation to make a difference through advocacy, a faith-based calling to teach, and a high level of control and autonomy as a teaching professional sustained high levels of hope and motivation to achieve goals, even in times of stress. This finding connects the idea of 'agency' and the need to set and achieve meaningful goals (Snyder, 1995). Hong and Greene (2011) investigated pre-service science teachers' hoped-for and feared-for selves as future teachers. They found that participants were predominantly hopeful and fearful in relation to future teaching effectiveness. Interestingly, the authors concluded that motivation to be successful as a teacher was higher when fear and hope were not balanced—fear being a motivating factor to strive to achieve goals, and disequilibrium being needed to challenge the trainee teachers' pre-existing belief systems. Bullough and Hall-Kenyon (2011) similarly explored teacher motivation by measuring pre-service and in-service teachers' sense of calling and level of hope. Like the previous authors, they found that participants felt called to teach and believed they were hopeful people. These findings were connected to Snyder's theory of hope in relation to a strong sense of agency and desire to set and achieve meaningful goals.

Against the backdrop of challenges facing Home Economics and a paucity of research in the subject in New Zealand, a small qualitative study was conducted with six teachers to voice their hopes for the future of Home Economics in New Zealand.

## Methods

The overall aim of the qualitative research was to give voice to Home Economics teachers in New Zealand secondary schools about possible future directions for the subject. This paper addresses the question *How do teachers articulate hope in relation to their vision of the future of Home Economics in New Zealand?*

The research employed a qualitative approach with transformational research foundations (Mertens, 2015). Transformational research design allowed opportunity for the participants to have their voices heard regarding a number of issues relating to the subject. An essential element of transformative research methodology is the involvement of participants across all parts of the research process. This

involvement was achieved in the study in several ways, for example through (a) member checks (Lincoln & Guba, 1985), (b) requesting comments on initial analysis of data, (c) asking three of the teachers to analyse a portion of the data, and (d) questioning participants as to whether being involved in the research changed their thinking, or provided impetus to take action, in relation to the future of Home Economics.

The six teachers who participated in the study were recruited with the assistance of the Home Economics and Technology Teachers Association of New Zealand (HETTANZ). Participants were Home Economics teachers from six different schools across two urban centres in New Zealand ranging in age from mid-30s to late-50s and were women. While one teacher had obtained a physical education degree and teaching qualification, the remaining five had studied home sciences/consumer and applied sciences.

In keeping with qualitative research design protocols, semi-structured interviews were used as the primary data collection tool. In fitting with transformative methodology, the interview questions were checked by participants before the interviews in order to ensure that their voices were heard and that what they wanted to tell could be told (Mertens, 2015). Three teachers were interviewed individually, and three teachers were interviewed in a group. Individual interviews with the researcher took place at the teachers' schools, and the group interviews took place at one teacher's school. The interviews were captured on a digital voice recorder and were approximately 60 minutes long. Each teacher was interviewed twice, and the digitally (audio) recorded interviews were transcribed.

For the initial interviews, questions were separated into three main sections:

1. How do teachers define contemporary Home Economics?
2. How do teachers want to be positioned in the school context and curriculum?
3. How do teachers view the value of Home Economics for learners in the 21st century?

The follow-up interview questions more specifically elicited data on the participants' hopes for the future of Home Economics. The questions were in two sections:

1. How might Home Economics contribute to a future-focused education?
2. How has being involved in this project changed the teachers' thinking about the future of Home Economics and what might they change after being involved in the project?

Ethical approval for the research was gained from the University of Canterbury's Educational Research Human Ethics Committee. Pseudonyms are used to present quotations from the teachers in this article, in order to maintain anonymity.

The analysis of the interview transcripts was carried out using Lichtman's (2013) three Cs of analysis: from coding to categorising to concepts. This process is iterative, inductive and reductive, whereby a researcher can organise data into codes and categories of codes. From this step, concepts (themes), descriptions and theories can be constructed (Coffey & Atkinson, 1996). Analytical memos were used alongside the three Cs of analysis to help the researcher record observations and thoughts (Mills & Morton, 2013).

## Findings

Three themes emerged from the analysis that related to the concept of hope. The themes were: the meaningful learning gained by students studying the subject; the possibilities for breaking down the misconceptions and negative perceptions that still exist about the nature of Home Economics; and a positive view of the future of the subject despite a range of challenges that exist. Quotes from the participants are used as evidence of the themes, interwoven with the author's prose and narrative.

### Theme 1: Meaningful learning outcomes as a source of hope

The teachers in this study identify how *The New Zealand Curriculum*, the HPE learning area within the curriculum, and the pedagogies employed in Home Economics lessons allow learners to develop skills and attributes that are not necessarily learned in other subjects. This gives the teachers hope that students who study Home Economics will become more capable, caring and engaged citizens.

The skills and attributes that were specifically mentioned were: food literacy gained from practical experiences; the social aspect of learning that allows young people to learn how to cooperate and work together to create and solve problems; the critical examination of societal issues that allows students to challenge stereotypical beliefs and consider advocacy, health promotion and empowerment actions. In this way, teachers are nourishing hope in their students and at the same time giving themselves hope that the work they are doing is meaningful and authentic.

Practical food preparation experiences were, as expected, highly valued by the participants as providing both key learning experiences in Home Economics, and an opportunity to practice working with others. Sarah discussed the social bonds developed in her classroom through sharing food. "We make them cook in partners and move around…I just think food, like sitting at a family meal table, that whole thing of sharing of food can … it does start conversations."

Learning experiences that were related to the underlying concepts of HPE were discussed as affording students the opportunity to engage in real-life learning contexts of societal significance, perspective-taking and critical thinking; as well as share cultural knowledge. For example, Sarah stated that: "I think we push them outside of their comfort zone when we look at issues like food security, determinants of health, unemployment—challenges their ideas about who the unemployed are. So I think we do a lot of challenging assumptions and myths."

A strong theme that emerged was students' development of mindsets connected to empowerment, awareness and advocacy. These learning outcomes linked to the underlying concepts of attitudes and values, the socio-ecological perspective and to health promotion. Harriet drew upon her students' health promotion actions when she asserted, "we are not going to solve the world's issues but we might start to make a little impact in our little part of the world." This reflects the IFHE (2016) *Statement on Hope*, particularly in relation to the value of well-being and sustainability at both individual and societal levels.

Participants in this study made both explicit and implicit reference to potential and actual outcomes in Home Economics for students' development of soft skills, for example, the development of empathy, communication skills, the ability to work in a group and to understand a variety of perspectives held by people and groups in society. To illustrate, Eve commented that "being able to communicate clearly and confidently, problem-solving, being creative, setting goals and taking action, reasoned argument. They are all things they will need… effective group work." These learning outcomes resonate Snyder and Feldman's call for the development of social skills and capabilities within education (2000).

Another finding was participants' discussion of the New Zealand milieu as related to food/well-being issues in society. This was seen to create opportunities that could be capitalised upon in relation to Home Economics learning, as explained by Sarah: "Media conversations around obesity and sugar tax—everything's very topical now, we can ride the crest of that wave." But at the same time, tensions were raised between community structures (determinants of health) and learning in Home Economics, an example is the impact of changing governments and students' access to cheap energy-dense foods from outlets proximal to schools. Societal issues connected to student-led health promote action. As Anna noted: "I actually take them to the food bank, we're there working with them." Katya reiterated this point when she explained: "I think Home Economics has a huge role to play in the community… health promotion is huge." This authentic and heuristic aspect of learning in Home Economics connects to the notion of collective hope being empowering and potentially revolutionary (Snyder & Feldman, 2000).

**Theme 2: Breaking down stereotypes as a source of hope**

Misconceptions surrounding Home Economics arose across the interviews in relation to the perceived contribution that learning outcomes in the subject might make towards solving societal issues such as the obesity epidemic. For example, Mere stated, "It's like the whole HPE curriculum is seen to be responsible, particularly with the obesity epidemic." In saying this, Mere was illustrating the perception held by others in her school, and by many in the wider society, that learning in HPE is expected to address health outcomes (for example, see Leahy et al., 2016; St Leger, 2004). However, the teachers capitalised on the transformative potential (Snyder & Feldman, 2000) of the Home Economics content in the curriculum and covered by NCEA in the senior secondary years of schooling by engaging learners in activities such as taking collective action to tackle food and nutrition-related

issues in their local community, or advocating for change in relation to food policies within their school.

The limiting attitudes of other teachers or senior leaders in the schools towards Home Economics, based possibly on their negative perceptions and misconceptions of the subject, were reported across the participants in the study. The perceived lack of others' knowledge about the nature of Home Economics was encapsulated in the following comment by Harriet: "I feel there is still a real lack of knowledge by management, staff, parents and students. I think that's a real challenge that we face—a real lack of knowledge about what Home Economics is." This finding reflects Snyder's (2000) idea of arising barriers that impede goals, as well as the notion that specific workaround actions are needed to overcome the barriers faced in order to remain hopeful, retain a sense of agency, know where one is headed and (ultimately) achieve a goal.

To this end, the teachers' use of further study opportunities was seen as a potential avenue for challenging others' negative perceptions of them as teachers or of the subject. Three of the six participants were currently involved in post-graduate University papers, having been awarded study leave from all or some of their classes. This was not only viewed as a chance to up-skill in areas relating to Home Economics and HPE but as an opportunity to challenge what Sarah viewed as others' (in-school) perceptions of her: "The reason I am doing this [qualification] is to give me more advanced standing with my peers." The fact that the teachers were engaged in further learning demonstrated that they had taken control of their professional life, were reflective practitioners, and had set goals for themselves, again with a clear pathway in mind. This once again evidences the claim that the teachers are hopeful in accordance with hope theory (Snyder, 1995).

**Theme 3: Having a positive view of the future of Home Economics as a source of hope**

The final research question, exploring whether participating in the research project had changed the teachers' thinking about the future of Home Economics and whether they would change any aspect of their practice, yielded findings that have been categorised within the final theme relating to hope—having a positive outlook on the future of the subject.

All participants raised the importance of being an advocate for Home Economics both within and outside of their schools and making an effort to be involved with the wider Home Economics community, for example through HETTANZ events. Anna stated, "I think if we can keep promoting it… maybe it's relooking at how we actually promote the subject and that is something I will think about and talk more about with other teachers as well." Katya echoed this when she articulated the need for Home Economics teachers to be "as supportive of each other as we always have been and sticking together." In the group interview, Eve commented "I suppose it just reinforces for me that I need to be a strong advocate for my subject. Yes, within my school, but also outside." In response to this comment, Mere said: "I agree we need to be constant advocates for our subject." This resonates with the finding from Levine (2013) that advocacy motivates teachers, and the importance of collective hope (Jacobs, 2005; Snyder & Feldman, 2000).

In terms of the Home Economics profession, the participants held onto hope that recent educational and wider societal shifts that have occurred in New Zealand could provide a way forward for the subject. For example, recognition of Home Economics as a University Entrance approved subject, access to a HPE scholarship and societal interest in nutrition and health issues. However, the latter is a double-edged sword, given the aforementioned confusion regarding the role of Home Economics (and HPE) learning in addressing health imperatives in society.

In relation to their thinking about the future of Home Economics, the participants commented that being involved in the research brought their concerns for the future of Home Economics to the surface, but also gave them some hope for the future of the subject. Katya commented "It has brought to the forefront my concerns that I've put to the back of my head. And also it makes me feel guilty about wanting to leave teaching, because what state am I going to leave it in." However, in email communication the day following the interview, Katya wrote: "Thanks again for helping make me realise that there is a place for me to stay in teaching for now." Anna commented that she was hopeful, despite also being concerned: "Maybe what I should say is that I am hopeful. I am still concerned about the future, but I am hopeful because I think you only need one person or two to help try and move the system and I think if we can keep promoting it…"

## Discussion

Jacobs (2005) states "We need to see hope as part of the process of an unfinished, rather than historically determined, world. We need to exercise critical hope even as we collectively try to foster and educate hope in ourselves and in our students" (p. 799). The findings of this study have demonstrated that Home Economics teachers in New Zealand are hopeful for the future of the subject in the country, despite the range of challenges that the subject and the Home Economics profession faces. Hope, as Jacobs alludes to in the quotation above, is important for both teachers and their learners; for both individuals and groups of people; for now, and for the future.

This study aimed to address questions concerning participants' perspectives on the nature and positioning of Home Economics in the curriculum, the value of Home Economics for learners in the 21st century and how being involved in the project changed the teachers' thinking about the future of Home Economics. Woven among the findings are themes relating to Charles Snyder's conception of hope: *motivation* to be an effective teacher with meaningful learning outcomes, *agency* (or lack thereof), striving for *goals* such as breaking down stereotypes by aiming for further qualifications, strengthened *pathways* for the subject and the profession moving forward, achieved through actions such as *advocacy* and involvement in the Home Economics community. The findings suggest some parallels with the American research of Bullough and Hall-Kenyon (2011), Hong and Greene (2011) and Levine (2013), whose studies all found that teachers had high levels of hope, motivation and goal-attainment proclivities in relation to their teaching practice.

The teachers articulated a variety of meaningful learning outcomes as a source of hope. While practical food experiences continue to be valued in the subject, outcomes relating to the HPE concepts, and learning about societal health and sustainability issues were also highly valued. Combined with outcomes relating to empathy, communication and cooperation, the subject was reported to offer to learners outcomes that relate to ideas expressed in the literature about hope (Snyder & Feldman, 2000) and in the IFHE World Congress Resolution Statement (IFHE, 2016).

While teachers discussed the challenge of stereotypical views, misconceptions, and assumptions held by other teachers, students and families in the wider school community, at the same time they raised the potential for breaking down the prevailing perceptions in a range of ways, including advocating for themselves and their subject which indicated the existence of hope, in parallel with the findings of Levine (2013) in terms of the importance of advocacy in teacher practice.

The findings in the final theme, hope for the future of the subject, suggest that individual Home Economics teachers believe in the worth of the subject and the ability to have conversations with others can inspire hope that leads to advocacy action (Jacobs, 2005). Also wider recognition of the value of Home Economics assists in maintaining hope, for example, recognition of the subject as a University Entrance approved subject, access to a HPE scholarship and societal interest in nutrition and health issues.

This research is significant for the Home Economics community in New Zealand given that it is one of very few studies conducted on this subject. For individual teachers, the findings of the study point to the need to be an advocate within and outside of their school to challenge the limiting perceptions and misconceptions that exist about Home Economics as well as find ways to communicate to others the nature of learning in the subject—that it is more than 'cooking and sewing' (Hipkins et al., 2005; Pendergast, 2001). This is also pertinent at subject association level, with action needed from within the Home Economics community in order to future-proof the subject and maintain the hopefulness that the teachers in this study demonstrated.

This was a small study, and therefore the findings are limited to the experiences of the six teachers participating in the study. Future research opportunities could involve not only a larger-scale project capturing teachers' views, but the exploration of students' perspectives of the value of Home Economics learning. The latter would provide the student voice that is missing from this research.

## Conclusion

The pursuit of hope has been a useful way to frame the findings from this qualitative research due to connections between the study's findings and conceptions of hope. Three main sources of hope for the teachers in the study were explored: meaningful learning outcomes, breaking down

stereotypes, and having a positive view of the future of Home Economics. These themes intersect with the notion of hope theory (Snyder, 1995) that in order to be hopeful, teachers need to be motivated to strive for goals, to see a way through current challenges, and feel that they have the agency to do so.

The findings of this study have demonstrated that Home Economics in New Zealand has a lot to offer students, schools and communities as we move further into the 21st century. Home economics being situated in HPE offers learners the ability to be critical of the world around them in relation to food contexts and develops in learners an appreciation for lifelong well-being for self, others and society. A likely way forward in order to address the challenges and future-proof Home Economics education in New Zealand is for advocacy actions by teachers and their subject association, HETTANZ. This will require 'thinking' and 'feeling' in terms of hope (Lopez et al., 2003).

## Disclosure statement

No potential conflict of interest was reported by the author.

## Biography

Rachael Dixon has been a teacher of Health Education and a provider of professional learning and development for teachers in the Health and Physical Education learning area in New Zealand. She is currently a doctoral candidate at the University of Otago, researching the long-term learning outcomes of senior secondary Health Education in New Zealand

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# Elderly care education instructional contents needed for integration in Home Economics curriculum of Nigeria Certificate in Education

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## Abstract

*Elderly care is the fulfilment of the special needs and requirements that are unique to the elderly. In Nigeria, care of the elderly has always been taken to be the responsibility of family members with little or no government support. Today Nigerian youth lack adequate knowledge of the elderly, this has led to a negative perception of the elderly, with the increasing elderly population there is a problem. Elderly care is not in any Home Economics program in Nigeria. This study developed an Elderly Care Education instructional content needed for integration into Home Economics Curriculum of Nigeria Certificate in Education (NCE). The study adopted the Research and Development design. The study was conducted in South-Eastern Nigeria. The population was made up of 846,960 respondents namely: 63 Home Economics lecturers, 193 Home Economics students, 3,092 nurses and 843,612 elderly persons. The entire population of Home Economics lecturers and Home Economics students were used. While a sample of 200 nurses was randomly selected and 40 elderly persons were purposively drawn to participate in the Focus Group Discussion (FGDs). Three instruments were developed and used to collect data. Cronbach alpha reliability coefficient index was used to determine the internal consistency of the instrument, and it yielded an overall coefficient of a = .97. The research questions were analysed using mean, while ANOVA was used to analyse the hypotheses then, Duncan's New Multiple Range Test (DNMRT) was used for pair wise comparison of means of items that were significantly different to determine the differences in the means. The findings include the content of 32 elderly care education courses. Based on the findings, recommendations were made.*

**KEYWORDS: ELDERLY CARE, HOME ECONOMICS, INSTRUCTIONAL CONTENTS, CURRICULUM, NIGERIAN**

## Introduction

Every family member has major phases of life cycle. These phases include infancy, adolescence, youth, adulthood and old age (elderly). Available reports indicate that the ageing population is increasing in all countries of the world (United Nations, 2006). It is estimated that there will be two billion people over the age of 60 years by 2050, and 80% of them will be resident in developing countries including Nigeria (Peterson, 2003). The National Population Commission [NPC] (2009) report

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on 2006 National Census indicates that there is an increase in the percentage of those 60 years and above in Nigeria.

As the elderly person advances in age, they face various forms of challenges some of which are physical, emotional, social and financial. These challenges are as a result of primary or secondary ageing. According to Guarente, Partidge and Wallace (2008), Primary ageing is rooted in genetics, time related and inevitable regardless of trauma, disease or stress while secondary ageing is those disabilities that result from disease and or trauma. The elderly could experience fatigue, dizziness, digestive and urinary function slow down leading to poor appetite, constipation, skin becomes wrinkled, dryer, thin and more fragile, muscles also deteriorate, and eye problems may occur (The Focus of The Family Physician Council [FFRC], 2002). They exhibit limited regenerative abilities, and are more prone to diseases, syndromes, and sickness. Some diseases associated with ageing include Alzheimer's diseases, arthritis, diabetes, cancer, heart attack, heart disease, osteoporosis, Parkinson's diseases, pneumonia and stroke (Caregivers Resources Center, n.d.). These characteristic challenges demand that the elderly should be provided support through various forms of care.

Elderly care is the fulfilment of the special needs and requirements that are unique to the elderly (elders). Elderly care emphasises the social and personal requirements of elders who need some assistance with daily activities and health care, but who desire to age with dignity. The components of elderly care involve the provision of care for the social, psychological and physical needs of elders. National Study of the Changing Workforce [NSCW] (2008) added that elderly care involves physical care in household work, meal preparation, dressing, feeding, toileting, bathing, transportation (e.g., going to medical appointments), emotional/social care (e.g., visiting, doing activities or going out together) and keeping elders safe (e.g., from falling down) while the indirect elderly care involves shopping, arranging for services, overseeing medical fare and handling finances

Elderly care in Nigeria has been within the extended family system (Anionwu, 1986; Adeokun, 1986; Akukwe, 1992; Ekpeyong, 1995). The older family members are cared for by their children, daughters-in-law and extended family members, especially the female family members. Then, the practice of marrying young girls to the elderly men was in vogue, and at times family members marry a young girl to care for their elderly father or brother. Some parents also send their children to their villages to live with their grandparents and run errands for them while the grandparents teach them cultural and moral values (Akukwe, 1992).This practice is, however, changing gradually.

In recent times in Nigeria, there is a noticeable decline in the level of care provided by family members for the elderly. Hoff (2007) pointed out that this decline in the care given to elderly family members is caused by the decline in the economy, gradual disintegration of the extended family system, unemployment, increasing female employment to complement family income and rural-urban migration. Care of the elderly has always been taken to be the responsibility of family members with little or no government support (Nwokolo, 2011). With the increasing elderly population and changing family values, there is need to create Elderly Care Education which will be integrated into the Nigerian education system especially in Home Economics.

Home Economics is offered at different levels of education in Nigeria. At the tertiary level which include Universities, Colleges of Educations, Polytechnics and Monotechnics, the study of elderly care is not in any Home Economics Program in Nigeria. The emphasis is on child and women care while the elderly with their challenges and needs appears to be neglected in Home Economics programs where it should also feature most prominently. Home Economists should acquire the skills that will involve a proper understanding of the characteristics and features of the elderly that should inform their care, understanding of the care they require, ability to provide such care and instructing others on these skills. Therefore, in order to prepare learners for successful Home Economics programs, there is a need for an appropriate curriculum that will be geared towards achieving the objective of Home Economic program. This calls for the development of Elderly Care Education instructional contents which will be integrated into Home Economics Curriculum.

The curriculum involves an array of activities, which culminate into a written guide for teachers in the classroom for use in the education of the pupils to become effective members of the society (Olaitan & Ali, 1997). Curriculum refers to the sum of the learning activities and experience that a student has under the auspices or direction of the school (Finch & Crunkilton, 1999). The curriculum can be described as all the learning experience provided by the school in order to achieve educational objectives of the society.

The curriculum contains contents which are described as the knowledge, skills, attitudes and values to be learned (Offorma, 2002). The content of Elderly Care Education Instructional Content is regarded as those practices, related facts, skills, attitudes and values of Elderly care to be taught and transferred to the learner.

Developing Elderly Care Education instructional contents for the Nigeria Certificate of Education (NCE) Home Economics Curriculum as a starting point will be an avenue to train the teachers who will transfer the knowledge to the learners. Teachers are the medium through which curriculum is translated into action in the classroom (Offorma, 2002). The Federal Government of Nigeria (2004) in the National Policy of Education (NPE) stated that the minimum qualification for entry into the teaching profession shall be the Nigeria Certificate in Education (NCE). Students in Colleges of Education are being certified with NCE. These NCE graduates are trained to teach in primary and junior secondary schools. Developing Elderly Care Education instructional contents for NCE Home Economics Curriculum will help to produce teachers who will transfer the knowledge on elderly care to young people in primary and junior secondary schools, therefore bridging the gap of elderly care towards improving the life of the elderly since elders are important family members and should be adequately cared for. The major purpose of this study was to develop an Elderly Care Education instructional contents that could be integrated into NCE Home Economics Curriculum.

## Hypothesis

There is no significant difference in the mean responses of Home Economics lecturers, Home Economics students and nurses on what should constitute the Elderly Care Education instructional contents to be incorporated into NCE Home Economics Curriculum.

## Methodology

The study adopted the Research and Development design. The study was conducted in South Eastern Nigeria which comprised five States namely, Abia, Anambra, Ebonyi, Enugu and Imo States. The five states are of the same tribe (Igbo) and have a similar culture with regards to care and management of elderly family members. The population was made up of 846,960 respondents, which includes 843,612 elderly persons (Central Intelligence Agency, [CIA], 2013), 63 Home Economics lecturers, 193 Home Economics students from the six Colleges of Education in the zone that offers Home Economics and 3,092 nurses working in the Federal Medical Centres (FMC) and federal teaching hospitals in the zone.

Multi-stage sampling technique was used to select the respondents for the study. This technique according to Eboh (2009) involves a procedure whereby the selection of units into the sample is organised in stages. In stage one, four out of the five states were purposively selected for the study. Stage two, second year and final year Home Economics students were purposively selected because they have been exposed to curriculum both in Education and the Home Economics Department so they are knowledgeable and can respond to the questionnaire items. The entire population of Home Economics lecturers was used because their population can be managed, so there was no sampling. For the nurses, simple random sampling technique was used to select 50 nurses from each of the Federal Medical Centres and teaching hospitals in the four states already selected making up a sample size of 200 nurses. Forty elderly people were purposely selected to participate in the focus group discussions.

Three different sets of instruments were used for data collection which includes: Elderly Person's Challenges Focus Group Discussion Guide (EPCFGD) which was used for phase I (Need Assessment) of the study. For phase II, Elderly Care Education Instructional Content Questionnaire (ECEICQ) and Elderly Persons' Care Content Focus Group Discussion Guide (EPCCFGD) were used for data collection. They were developed based on the objectives of the study, findings from Phase I and extensive review of the literature. The ECEICQ was divided into two major parts. Part I sought information on the personal data of the respondents. Part II obtained information on Elderly Care Education Instructional Contents needed for integration into NCE Home Economics Curriculum. The items of the questionnaire were structured on a four point rating scale of *Strongly Agree* (SA) = 4, *Agree* (A) = 3, *Disagree* (D) = 2, *Strongly Disagree* (SD) = 1.

The instruments were face validated by five experts comprising of three Home Economics lecturers, one Social Work lecturer and one Health Education Lecturer. Based on their recommendations and

corrections the final version of the instrument was developed. In order to determine the reliability of the instrument (ECEICQ), the questionnaire was distributed to 25 respondents in Asaba, Delta State. Asaba is not under the area of the study, but it has similar characteristics with the area under study. The analysed data yielded a coefficient of α = .95. Which was considered high and accepted and this means that the instrument is reliable and consistent in measuring what it was designed to measure.

ECEICQ was administered by hand to the respondents with the help of four trained research assistants. The research question was analysed using means and standard deviation. The hypothesis was tested using analysis of variance (ANOVA) at 0.05 level of significance. Duncan's New Multiple Range Test (DNMRT) was further used for pair wise comparison of means of items that were significantly different to identify the relationship in the mean difference of each of the three sampled means.

Table 1 shows the mean distribution of the opinions of the respondents on what should constitute the content of Elderly Care Education Courses for NCE Home Economics Curriculum. The Table has three sub-sections namely: *elderly needs*, *elderly health management* and *elderly home management*. Under *elderly needs*, items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13 with corresponding means of 3.33, 3.47, 3.33, 3.29, 3.27, 3.28, 3.34, 3.33, 3.14, 3.06, 3.01, 3.36 and 3.11 respectively, were all within the range of 2.50 to 3.49 indicating that they were all agreed by the respondents as content to be covered in Elderly Care Education Courses. Items 14 and 15 with means of 3.61 and 3.52 respectively were within the acceptance range of 3.50 to 4.00 showing that they were strongly agreed by the respondents to be the content to be covered in Elderly Care Education Courses under *elderly health management*. Items 16, 17, 18, 19, 20, 21 and 22 obtained means above the acceptance range of 2.50 to 3.49 which is within the agreed category showing that the respondents agreed that this content should be covered under *elderly health management*.

A cluster mean of 3.41 was obtained from Table 1 indicating that the outlined contents were agreed by the respondents as the content to be covered in Elderly Care Education Courses. The standard deviation ranges from 0.51 to 0.85. This shows that the respondents were close to one another in their responses.

**Table 1** **Mean scores of responses of Home Economics lecturers, Home Economics students and nurses on content of Elderly Care Education courses**

| S/N | Contents topics related to *elderly needs* | $M_1$ | $M_2$ | $M_3$ | $M_G$ | *SD* | Remark |
|---|---|---|---|---|---|---|---|
| 1. | Characteristics of the elderly | 3.37 | 3.35 | 3.30 | 3.33 | 0.65 | Agree |
| 2. | Physical needs of the elderly | 3.50 | 3.48 | 3.46 | 3.47 | 0.58 | Agree |
| 3. | Emotional needs of the elderly | 3.44 | 3.29 | 3.33 | 3.33 | 0.71 | Agree |
| 4. | Social needs of the elderly | 3.35 | 3.33 | 3.24 | 3.29 | 0.69 | Agree |
| 5. | Components of elderly care | 3.29 | 3.22 | 3.31 | 3.27 | 0.69 | Agree |
| 6. | Biological changes in the elderly | 3.33 | 3.24 | 3.29 | 3.28 | 0.71 | Agree |
| 7. | Physiological changes in the elderly | 3.42 | 3.28 | 3.38 | 3.34 | 0.68 | Agree |
| 8. | Psychological changes in the elderly | 3.44 | 3.30 | 3.33 | 3.33 | 0.74 | Agree |
| 9. | Concept of elder abuse and neglect | 3.18 | 3.12 | 3.16 | 3.14 | 0.78 | Agree |
| 10. | Concept of gerontological nursing | 3.08 | 2.91 | 3.19 | 3.06 | 0.82 | Agree |
| 11. | Theories relevant to ageing and gerontological nursing | 3.04 | 2.91 | 3.08 | 3.01 | 0.83 | Agree |
| 12. | Home care of the elderly | 3.35 | 3.29 | 3.43 | 3.36 | 0.68 | Agree |
| 13. | Institutional care of the elderly | 3.14 | 3.15 | 3.07 | 3.11 | 0.78 | Agree |
| **Content topics related to *elderly health management*** | | | | | | | |
| 14. | Dietary requirements of the elderly | 3.60 | 3.69 | 3.53 | 3.61 | 0.51 | Strongly disagree |
| 15. | Meal planning to meet the nutritional needs of the elderly | 3.56 | 3.56 | 3.48 | 3.52 | 0.59 | Strongly disagree |
| 16. | Guidelines for choosing foods for the elderly | 3.44 | 3.43 | 3.36 | 3.40 | 0.66 | Agree |
| 17. | Meal preparation methods for proper digestion in the elderly | 3.57 | 3.52 | 3.31 | 3.44 | 0.61 | Agree |

| S/N | Contents topics related to *elderly needs* | $M_1$ | $M_2$ | $M_3$ | $M_G$ | *SD* | Remark |
|---|---|---|---|---|---|---|---|
| 18. | Food and management of common diseases of the elderly for example diabetes, cancer, high blood pressure, arthritis | 3.58 | 3.40 | 3.38 | 3.41 | 0.71 | Agree |
| 19. | Helping exercises necessary for the elderly's good health | 3.47 | 3.37 | 3.31 | 3.36 | 0.69 | Agree |
| 20. | Benefit of rest and sleep to the elderly's health | 3.52 | 3.43 | 3.49 | 3.47 | 0.62 | Agree |
| 21. | Toileting related care for the elderly | 3.46 | 3.14 | 3.22 | 3.22 | 0.67 | Agree |
| 22. | Recreational and relaxation activities for the elderly | 3.34 | 3.25 | 3.22 | 3.22 | 0.67 | Agree |
| **Contents topics related to *elderly home management*** | | | | | | | |
| 23. | Basic clothing requirements of an elderly | 3.33 | 3.43 | 3.23 | 3.33 | 0.70 | Agree |
| 24. | Planning wardrobe for the elderly | 3.04 | 3.10 | 2.85 | 2.99 | 0.85 | Agree |
| 25. | Care of elderly people clothes | 3.33 | 3.35 | 3.18 | 3.28 | 0.72 | Agree |
| 26. | Housing needs of the elderly | 3.26 | 3.28 | 3.12 | 3.21 | 0.73 | Agree |
| 27. | Sanitation of elderly home. | 3.43 | 3.42 | 3.37 | 3.40 | 0.65 | Agree |
| 28. | Basic facilities needed in elderly home | 3.37 | 3.32 | 3.31 | 3.32 | 0.71 | Agree |
| 29. | Maintenance of elderly home | 3.35 | 3.45 | 3.28 | 3.36 | 0.66 | Agree |
| 30. | Common home accidents of the elderly | 3.38 | 3.26 | 3.36 | 3.32 | 0.72 | Agree |
| 31. | Safety considerations in the home of the elderly | 3.46 | 3.39 | 3.36 | 3.39 | 0.69 | Agree |
| 32. | First aid treatments of the elderly | 3.38 | 3.30 | 3.44 | 3.37 | 0.71 | Agree |
| 33. | Prevention of elderly home accidents | 3.42 | 3.27 | 3.45 | 3.37 | 0.66 | Agree |

*Note.* $M_1$ = mean of Home Economics Lecturers, $M_2$ = mean of Home Economics students, $M_3$ = mean of nurses, $M_g$ = Grand mean, *SD* = Standard deviation.

### Result of the Elderly Persons' Care Content Focus Group Discussion Guide (EPCCFGD)

The EPCCFGD session was conducted to get qualitative data which was used to validate the quantitative data collected in finding answers to research question of the study. The EPCCFGD was organised in two towns. The first one was done at Ogidi in Anambra State among the pensioners at Idemili North LGA headquarter in Anambra State. While the second EPCCFGD was done among elderly members of Eha-alumona, Nsukka LGA of Enugu State. Twenty participants were selected for the EPCCFGD, both male and female were part of the EPCCFGD. The discussion was held in Ogidi and Eha-alumona respectively. At Ogidi it was done after the meeting of the pensioners in the LGA while at Eha-alumona, it was done in the evening, after their main day activities. Four trained research assistants and the researcher acted as facilitators in the EPCCFGD sessions. The discussion was brief with light refreshment, which was used to arouse the interest of the participants. The effort was also made to ensure that all the participants contributed to the discussion and that no individual dominated the discussion. The discussions were recorded with notes, tape recorder and video camera. This helped in getting all that was discussed. The EPCCFGD was descriptively analysed, and issues discussed revealed the following:

1. Elderly challenges which include (a) physical (b) social (c) emotional changes in the life of an elderly person, loneliness, poverty widowhood practices, house care challenges.
2. Ways children can help the elderly cope with the challenges.
3. Respect for the elderly
4. Consequences of elderly abuses
5. Meeting the emotional challenges of the elderly
6. Foods that are good for the elderly and invalids
7. Ways of helping to improve the condition of the elderly.

Table 2 shows ANOVA results on difference in the mean perception of the respondents on the content of ECEC. The results show that the perception of the respondents with regards to the content of ECEC were significantly different in items, 10, 14, 17, 21, 23, 24, 29 and 33. Pair wise comparison of means using DNMRT shows that their mean differences in the items did not follow a given pattern. For example, all items should be part of the content of ECEC. Pair wise comparison of mean shows that for item 10, the mean of Home Economics lecturers (3.08) do not differ significantly with a mean of nurses (3.19) but differs significantly with the mean of Home Economics students (2.91). For items 14 and 23, means of nurses do not differ significantly with the mean of Home Economics nor with the mean of Home Economic lecturers. For items 17, 24 and 29, the mean responses of Home Economics lecturer did not differ significantly with a mean of Home Economics students but did differ significantly with the means of nurses. For item 21, the mean responses of Home Economics students are equal to the mean of nurses but differ significantly with the mean of Home Economics lecturers. For item 33, the mean responses of Home Economics lecturers and nurses are equal but differ significantly with the mean of Home Economics students.

**Table 2 ANOVA results on differences in the mean perceptions of the respondents on the content of ECEC**

| S/N | Content of ECEC | $M_1$ | $M_2$ | $M_3$ | F-ratio | Sig of F | Remark |
|---|---|---|---|---|---|---|---|
| ***Elderly needs*** | | | | | | | |
| 1. | Characteristic of the elderly | 3.37 | 3.35 | 3.30 | 0.29 | 0.75 | NS |
| 2. | Physical needs of the elderly | 3.50 | 3.48 | 3.46 | 0.14 | 0.87 | NS |
| 3. | Emotional needs of the elderly | 3.44 | 3.29 | 3.33 | 0.96 | 0.38 | NS |
| 4. | Social needs of the elderly | 3.35 | 3.33 | 3.24 | 0.98 | 0.38 | NS |
| 5. | Components of elderly care | 3.29 | 3.22 | 3.31 | 0.80 | 0.45 | NS |
| 6. | Biological changes in the elderly | 3.33 | 3.24 | 3.29 | 0.38 | 0.68 | NS |
| 7. | Physiological changes in the elderly | 3.42 | 3.28 | 3.38 | 1.54 | 0.22 | NS |
| 8. | Psychological changes in the elderly | 3.44 | 3.30 | 3.33 | 0.79 | 0.46 | NS |
| 9. | Concept of elder abuse and neglect | 3.18 | 3.12 | 3.16 | 0.14 | 0.87 | NS |
| 10. | Concept of gerontological nursing. | $3.08_{ab}$ | $2.91_{b}$ | $3.19_{a}$ | 5.51 | 0.04 | S |
| 11. | Theories relevant to ageing and gerontological nursing. | 3.04 | 2.91 | 3.08 | 1.94 | 0.15 | NS |
| 12. | Home care of the elderly | 3.35 | 3.29 | 3.43 | 1.81 | 0.16 | NS |
| 13. | Institutional care of the elderly | 3.14 | 3.15 | 3.07 | 0.50 | 0.61 | NS |
| ***Elderly health management*** | | | | | | | |
| 14. | Dietary requirement of the elderly | $3.60_{ab}$ | 3.69a | $3.53_{b}$ | 4.18 | 0.02 | NS |
| 15. | Meal planning to meet the nutritional needs of the elderly. | $3.56_{a}$ | $3.56_{a}$ | $3.48_{b}$ | 0.94 | 0.39 | NS |
| 16. | Guideline for choosing foods for the elderly | 3.44 | 3.43 | 3.36 | 0.73 | 0.48 | NS |
| 17. | Meal preparation methods for proper digestion in the elderly. | 3.57a | 3.52a | $3.31_{b}$ | 6.87 | 0.00 | S |
| 18. | Food and management of common diseases of the elderly for example diabetes, cancer, high blood pressure, arthritis | 3.58 | 3.40 | 3.38 | 1.63 | 0.20 | NS |
| 19. | Helping exercises necessary for the elderly's good health | 3.47 | 3.37 | 3.31 | 1.26 | 0.28 | NS |
| 20. | Benefit of rest and sleep to the elderly's health | 3.52 | 3.43 | 3.49 | 0.60 | 0.55 | NS |
| 21. | Toileting related care for the elderly | $3.46_{a}$ | $3.14_{b}$ | $3.22_{b}$ | 4.64 | 0.01 | S |
| 22. | Recreational and relaxation activities for the elderly | 3.34 | 3.25 | 3.22 | 1.37 | 0.26 | NS |
| ***Elderly home management*** | | | | | | | |
| 23. | Basic clothing requirements of an elderly | $3.33_{ab}$ | $3.43_{a}$ | 3.23b | 3.49 | 0.03 | S |
| 24. | Planning wardrobe for the elderly | $3.04_{a}$ | $3.10_{b}$ | $2.85_{b}$ | 3.58 | 0.03 | S |
| 25. | Care of elderly people clothes | 3.33 | 3.35 | 3.18 | 2.74 | 0.07 | NS |
| 26. | Housing needs of the elderly | 3.26 | 3.28 | 3.12 | 2.21 | 0.11 | NS |
| 27. | Sanitation of elderly home. | 3.43 | 3.42 | 3.37 | 0.31 | 0.74 | NS |

| S/N | Content of ECEC | $M_1$ | $M_2$ | $M_3$ | F-ratio | Sig of F | Remark |
|---|---|---|---|---|---|---|---|
| 28. | Basic facilities needed in elderly home. | 3.37 | 3.32 | 3.31 | 0.13 | 0.88 | NS |
| 29. | Maintenance of elderly home | $3.35_a$ | $3.45_a$ | $3.28_b$ | 2.93 | 0.05 | NS |
| 30. | Common home accidents of the elderly | 3.38 | 3.26 | 3.36 | 1.15 | 0.32 | S |
| 31. | Safety considerations in the home of the elderly | 3.46 | 3.39 | 3.36 | 0.42 | 0.66 | NS |
| 32. | First aid treatments of the elderly | 3.38 | 3.30 | 3.44 | 1.65 | 0.19 | NS |
| 33. | Prevention of elderly home accidents | $3.42_a$ | $3.27_b$ | $3.45_a$ | 3.27 | 0.04 | NS |

*Note*. S = significant, NS = Not significant, F–tabular at 0.05 probability level = 3.00, $M_1$ = mean of Home Economics Lecturers, $M_2$ = mean of Home Economics students, $M_3$ = mean of nurses. Letters of alphabet indicate significant difference. Means with the same letters of the alphabet are not significantly different while means with different letters of the alphabet are significantly different.

### Instructional content of Elderly Care Education Courses

A total of 32 content topics that should constitute the content to be covered in the Elderly Care Education Courses within NCE Home Economics Curriculum were identified. These topics were organised under three themes as follows:

*A. Introduction to elderly care needs*

1. concept of the elderly
2. changes in the elderly
3. components of elderly care
4. concept of elder abuse and neglect
5. concept of nursing the elderly

*B. Elderly health management*

1. elderly nutrition
2. management of common diseases of the elderly
3. relaxation and recreation activities for elderly

*C. Elderly home management*

1. elderly house keeping
2. elderly clothing
3. elderly safety

## Discussion on findings

The findings of the hypotheses (see Table 2) revealed that there was significant difference in the mean rating response of the Home Economics lecturers, Home Economics students and nurses on the seven content topics out of the 32 content topics revealed as the Elderly Care Education instructional contents needed for integration in NCE Home Economics Curriculum.

The findings of the study revealed 33 topics that should constitute the content of ECEC for NCE Home Economics Curriculum. The findings include physical needs, emotional needs and social needs of the elderly. These needs are part of the health of the elderly. This is in line with World Health Organization (WHO, 1947) definition of health, that health is the state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

The study revealed contents that are considered appropriate by the respondents to be included in ECEC. These contents were grouped under three main themes as follows: Introduction to elderly care needs, elderly health management and elderly home management. Each theme contains some other content topics that were arranged to cover the scope of each theme, which is aimed at incorporating

the needed knowledge, skills and attitudes that are needed to properly care for the elderly. This is in line with Offorma (2002) who described content as the knowledge, skills, attitude and values to be learned.

There was no significant difference in the mean responses of Home Economics lecturers, Home Economics students and nurses on 26 items out of 33 items identified while there was significant difference in the mean responses of five items. This includes components of gerontological nursing, the dietary requirement of the elderly, meal preparation methods for proper digestion of the elderly, toileting related care for the elderly, basic clothing requirements of an elderly person, planning wardrobe for the elderly and maintenance of the elderly's home.

## Conclusion

Elderly persons have challenges which could necessitate care for them by family members. Today family members do not have the skills and knowledge to care for the elderly family members and the youth have a poor perception about the elderly people. Home Economics Program that is supposed to take care of family members does not have any provision in their courses to care for the elderly persons. Hence, this study developed an Elderly Care Education instructional content that could be integrated into the NCE Home Economics Curriculum.

## Recommendations for further action

Based on the findings of the study:

1. Curriculum planners (NCCE, NERDC) should utilise the Elderly Care Education Instructional Content developed by this study to review the current NCE Home Economics Curriculum as an important component of the curriculum.

2. The findings of this study should be communicated to the public through Home Economics professional bodies and associations like Home Economics Teachers Association of Nigeria (HETAN), Home Economics Research Association of Nigeria (HERAN), Home Economics Council of Nigeria (HECON), International Federation of Home Economics (IFHE), through conferences, workshops and seminars.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Biography

Professor Elizabeth Anyakoha is a teacher and researcher in Home Economics discipline. She has published several articles in local and international journals. She is the founder of Home Economics Research Association of Nigeria (HERAN) and the editor of the Nigerian Journal of Home Economics Research and belongs to several other professional associations in Nigeria and abroad. She has successfully supervised 30 PhD theses and 60 MEd projects. She has published two standard textbooks in Home Economics namely Home Management for schools and Colleges and Home Economics for junior secondary schools. These are widely used in Nigeria schools and in some West African countries.

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# A case study: Fashion design and merchandising college core curriculum assessment to improve future learning

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## Abstract

*The fashion industry is ever evolving, thus educational institutions are faced with the challenge of staying current in their curriculum while instilling traditional core knowledge. "To continue in patterns of the past is not good enough; denial does not divert change" (Laughlin & Kean, 1995, p. 196). The purpose of this research is to assess the foundational knowledge and skills of design and merchandising sophomores in the Fashion Design and Merchandising (FDM) majors. The results of this study will identify gaps in students' core knowledge and skills. Strategies for improving* original learning *and learning retention will be developed and implemented.*

*Over the course of two and a half years, the researchers developed a comprehensive exam of the FDM core curriculum: fashion visuals (colour theory and presentation), fundamentals of fashion, apparel analysis, fabrics, and fashion technology (i.e. Adobe Suite). After two pilot tests, the assessment exam questions were finalised resulting in 112 questions which included 99 core curriculum questions and 13 demographic questions. Data were analysed using the Statistical Package for the Social Sciences (v. 22).*

*Results revealed that the largest gaps in retention were the areas concerning basic knowledge of fabric and apparel analysis. Design major students scored higher than merchandising students on questions related to technology, fabric, and garment construction terms. Non-transfer students scored higher on questions regarding fashion visuals and apparel analysis terms compared to transfer students. This study's contribution offers a model that others can utilise in hopes of enhancing curriculum and building a vision for the future.*

**KEYWORDS: STUDENT ASSESSMENT, LEARNING, RETENTION, FASHION, DESIGN, MERCHANDISING**

## Introduction

The fashion business is a fast moving industry, changing quickly and ever evolving (Doyle, Moore, & Morgan, 2006). With the speedy changes, it is a challenge to balance teaching core knowledge and skills while helping students learn to embrace change and adapt to constant updates in the industry. Fashion programs need to be able to adapt to the constant updates in the industry and be proactive in their connection with the industry (Laughlin & Kean, 1995). However, core knowledge is what sustains the fashion industry in the midst of inventions, new technology and other developments.

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Fashion design and merchandising (FDM) students—our future leaders—must follow and in some instances create the change. Hence, change cannot happen without a true understanding of the foundational backbone of the fashion industry. Students' college core knowledge becomes the means of sustaining that backbone. Unfortunately, college students forget much of the foundation/core curriculum they learned before entering the workplace.

Historically, studies show students begin to lose more than 60% of their learning after only 20 minutes following instruction (Ebbinghaus, 1985). More recently, it has been found that "almost all knowledge learned in school will be lost in the course of a few years" (Custers, 2010, p. 122). FDM students will be entering into a high-speed and highly intense industry. Thus it is imperative to their success that they retain core knowledge. For the purpose of the current study, we evaluated the level of retention FDM sophomore students have of their core curriculum. Variables such as major (either design or merchandising) and transfer versus non-transfer status have been considered. Also within the current study, a focus was placed on two forms of assessment models (summative and formative) in order to gain a better understanding of knowledge retention and how to improve it in the future. In this study, the researchers used the terms *test*, *exam*, and *assessment* interchangeably.

## Literature review

### Student retention

The type of pedagogical approach employed is important to consider when teaching the FDM core curriculum to fashion students. Choi (2012) found that creative students' achievement increased by 10—20% after varying the teaching approach from a traditional lecture format. Art [fashion] students tend to be very diverse in ethnicity, race, and social group. Also, their personality, interests, learning styles, motivation levels, and work ethic are important elements to consider when devising the pedagogical approach (Zimmerman, 1992). Furthermore, increasing student achievement is only half the battle; the other half is ensuring that the students retain the knowledge they learned. Retaining knowledge begins with the initial teaching approach or *original learning* (Druckman & Bjork, 1991). "Long-term retention of a task [or skill] can be improved by increasing the level of the original learning. Indeed the level of original learning for a task [or skill] is the best single predictor of long-term retention" (Druckman & Bjork, 1991, p. 26). According to Druckman and Bjork (1991), "the level of original learning is not only a major determinant of retention, it is also a major determinant of transfer" (p. 37). Original learning involves the initial pedagogical approach as well as how receptive the students were during that time. Once the teaching approach has been solidified, learning can be further enhanced by students having opportunities to practice the skills they learned, which results in overlearning.

Overlearning is post-mastery learning and is "simply the number of practice trials that trainees perform after the criterion has been achieved" (Druckman & Bjork, 1991, p. 28). For example, FDM students who learned colour theory and design principles early in their college career will have the opportunity to practice and reinforce those skills in a more advanced design class. According to Custers (2010), "there will be no retention problem if knowledge is frequently used after formal instruction has been terminated" (p. 123). The question becomes how frequent should the overlearning happen? There is a way to develop purposeful chances for overlearning; as research showed, spaced out time intervals for practice reaps the most benefits for long-term retention. Back-to-back practice will not result in a high level of long-term retention (Druckman & Bjork, 1991). Bahrick and Phelps (1987) found that 30-day intervals of practice were better for long-term retention than a one-day interval for practice. If said knowledge/skills are worth retaining, educators should reinforce the skills in successive courses while keeping in mind *contextual variety* in the application of knowledge/skills.

The contextual variety Druckman and Bjork (1991) discussed is imperative in knowledge transfer. Transfer of learning results in a more deeply ingrained way of knowing. For example, transferable knowledge or skills will enable merchandising students to reference fabrics information introduced to them as a sophomore in college and apply it to their career 5—10 years later as a fabric sourcer. Another example of transfer would be the ability of a fashion design student who learned design principles as a freshman in college to be able to transfer that knowledge into a career as a product packaging designer. What tools can we use to understand the level or benefits of overlearning and transfer? Research has shown that summative and formative assessments are adequate measures to evaluate student learning and retention (Garrison & Ehringhaus, n.d.).

**The summative and formative assessment connection**

Assessments are data gathering processes used to identify students' achievement, where gaps may occur in learning, and insights about teaching. Summative assessment (SA) is a one-way interchange between the teacher and student, with the teacher being in the active/conductor role and the student being in the passive role (Black & Wiliam, 2009). SA is a comprehensive test/examination administered once a subject has been taught or a program has been created and implemented to compare it against some standard or benchmark. Summative evaluations can only yield information to determine whether the subject matter or program has met its intended goals (Greenstein, 2010). According to Tara (2005), SA is used to certify student achievement; however, SA can still inform future learning, if partnered with formative assessment (FA) traits. Further, Tara stated that in the past, the SA has been downplayed and minimised in its connection to the theory of FA because SA has not been considered diagnostic or useful to enhance student learning (Hidden Curriculum, 2014).

"Formative assessment is, in fact, summative assessment plus feedback which is used by the learner" (Tara, 2005, p. 466). According to Miller, Imrie, and Cox (1998), the main difference between SA and FA is that FA offers feedback, which allows students the opportunity to practice essential skills in the classroom. The SA is usually given at the end of the learning phase, whereas the FA "program is in the planning and development stages, it is malleable, and the information gathered from the evaluation can, therefore, contribute to change in the program" (Greenstein, 2010, p. 5). With FA, there is direct student influence on teaching and learning. Using feedback, FA fosters two-way interchange between educators and students regarding the student's progress. This interchange results in improvement of curriculum and student learning.

A summative multiple-choice test itself is not an accurate/valid assessment of learning according to the FA model in Figure 1 developed by Heritage (2009a). However, a multiple-choice test develops into a valid assessment tool when the data collected from the test are used to adjust/enhance learning and instruction (Grant Wood Area Education Agency, n.d.). The data collected from the multiple-choice test along with the feedback from the learner are the actual FA. This type of assessment becomes an avenue for professional development when "teachers use assessment and learning dynamically; they increase their capacity to derive a deeper understanding of their students' responses; this then serves to structure increased learning opportunities" (Darling-Hammond, Ancess, & Falk, 1995, p. 131). The FA model shows that after the test elicits the evidence of achievement, the feedback between the teacher and student will eventually lead to the learning gap being closed, resulting in an enhanced learning and teaching experience.

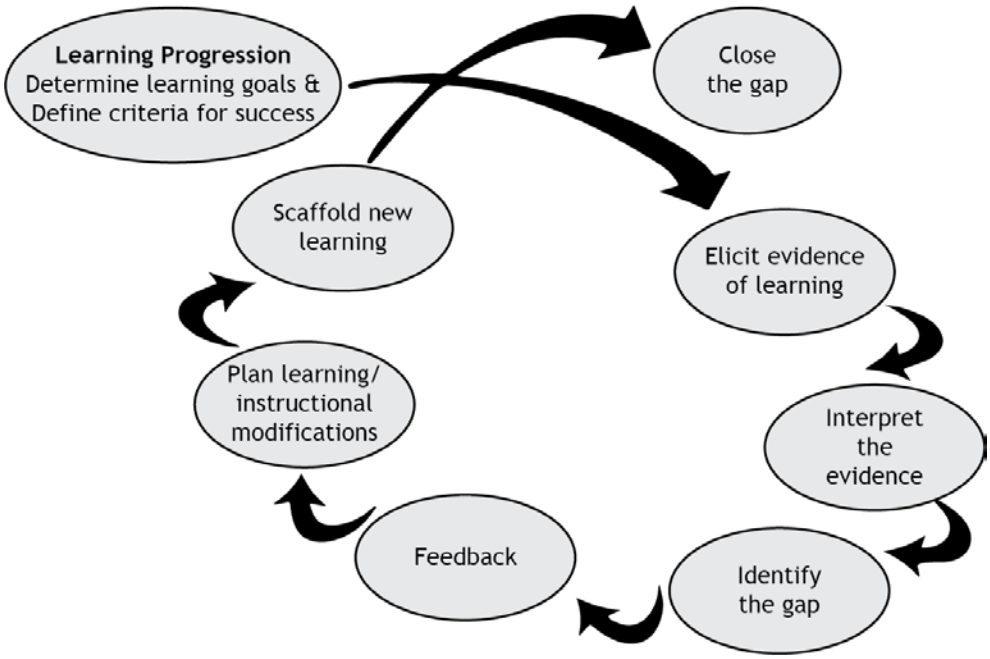


**Figure 1 Formative Assessment Model (Heritage, 2009a)**

According to Garrison and Ehrighaus (n.d.), SA can take place as far out as a year from the initial instruction. "SA happens too far down the learning path to provide information at the classroom level and to make instructional adjustments and interventions during the learning process" (p. 1). Therefore, it is best to balance both SA and FA for a comprehensive picture of a student's strengths and weaknesses (Garrison and Ehrighaus, n.d.). In retrospect "it is not possible for assessment to be uniquely formative without the summative judgment having preceded it" (Tara, 2005, p. 468). Thus, the answer to higher levels of retention may very well be the balance of both the summative and formative assessments as suggested by Garrison and Ehringhaus (n.d.), along with opportunities for overlearning and transfer as recommended by Druckman and Bjork (1991).

## Theoretical framework

The framework developed for the current study encompasses SA and scratches the surface of FA; however, it does not run the full gamut of the two-way teacher/student interchange required by a true formative evaluation. The FDM students have already completed the core course curriculum, and therefore, their achievement/learning is "irreversible," making this approach summative in nature (Miller et al., 1998). However, the researchers propose using the feedback/results of this exam to improve the learning experience for future students, which is a factor that connects the FDM assessment with formative characteristics. With the balance of both summative and formative assessment, a clearer picture of the students' knowledge retention of the core FDM curriculum can be evaluated (Garrison & Ehringhaus, n.d.). See Figure 2 for a visual representation of this framework.

The *FDM summative and formative assessment interchange model* was inspired by the work of Black and Wiliam (2009), Druckman and Bjork (1991), Garrison and Ehringhaus (n.d.), Tara (2005), as well as Zimmerman (1992). According to Black and Wiliam (2009), "summative tests provide ways of eliciting evidence of student achievement and used appropriately, can prompt feedback that moves learning forward" (p. 8). Tara (2005) argues that FA cannot exist without SA and that the latter informs the other. The model shows the one-way summative interchange of teacher testing and student achievement; however, the FDM assessment does not stop here, but it goes the next phase into a FA by using the students' exam data in order to identify professional development opportunities for teachers.

Through the growth of the educator, the exams are adjusted to reflect updated standards as well as new creatively diverse pedagogical approaches that are employed to better meet future students' needs. Consequently, students are indirectly influencing future teaching and learning. Then the summative process begins again by administering the updated exam to future students. As Black and Wiliam (2009) discussed, the purpose of FA is to provide feedback in a two-way/reciprocal interchange between the teacher and the student in order to enhance day-to-day teaching practices and learning. With the current model through an indirect or passive two-way interchange, this study proposes that teachers use the feedback to enhance future students' learning experiences. Zimmerman (1992) stated that it is best for educators to use a diversity of teaching approaches/programs to reach students in creative majors; "these teachers have a much greater influence on student learning and achievement than do most traditional, large-scale evaluation programs" (p. 15).

In the end, retaining the FDM core knowledge becomes the focus, therefore Druckman and Bjork (1991) stressed the importance of *overlearning* to increase the chances of long-term curriculum *retention*. As seen in the model, adding overlearning opportunities result from insights gained during professional development; *the summative and formative assessment interchange model* promotes macro level *retention* (grand overall knowledge attained and held by students) for hopes of fostering knowledgeable and competent future leaders in the fashion industry who have the ability to *transfer* their knowledge in a multitude of contexts. Knowledge transfer is the ultimate goal and mission of the FDM program here at Kent State University (KSU) and is the recommended goal for all programs teaching fashion students. For the purpose of this student centred research, the following questions guided the study:

1. What foundational knowledge of FDM Core curriculum is retained or lost for the first two years of the student academic career?
2. How do design and merchandising students differ in what they retain or do not retain of the FDM core curriculum?

3. What are the differences between transfer students and non-transfer students in terms of retaining FDM core knowledge?
4. What are the differences in foundational knowledge among students who took FDM core curriculum at KSU versus those who took core curriculum elsewhere?

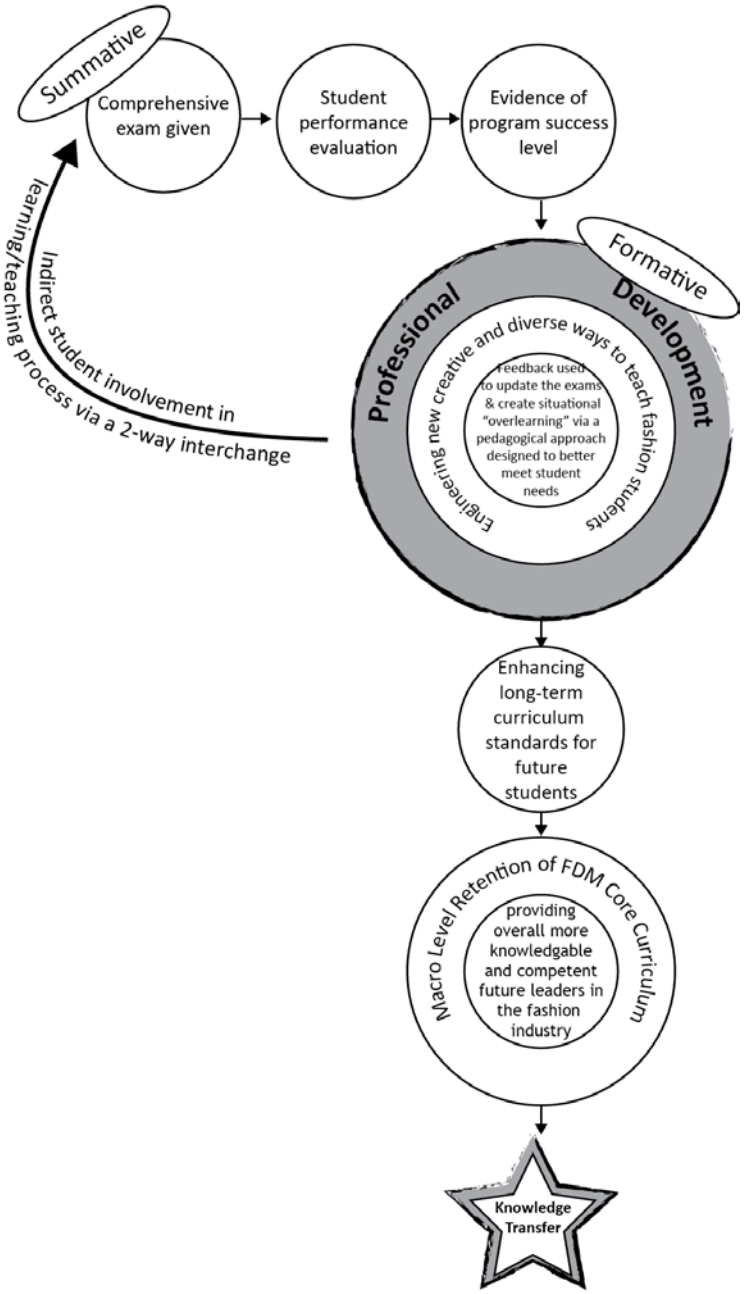


**Figure 2 The FDM summative and formative assessment interchange model**

## Method

Two pilot studies were conducted before the actual data were collected for this study. In Spring 2014, the first pilot test was conducted with senior Fashion Merchandising and Fashion Design students who were enrolled in *Apparel in Global Economy* and *Fashion Studio III* respectively in the beginning of the semester. The second pilot study was conducted at the end of the same semester with junior Fashion Merchandising and Fashion Design students who were enrolled in *Professional Seminar* and *Junior Design Studio* courses. During both pilot studies, students were assessed on FDM core courses such as Fashion Fundamental, Fashion Visuals, Introduction to Fashion Technology,

Apparel Analysis, and Fashion Fabrics. The students who took the first pilot test were seniors and had not taken the new core classes KSU recently added to the curriculum. It was found that the Merchandising students struggled with the Technology portion since they had not had a class in this area. The results of two pilot studies also showed that some of the questions had to be revised to assess students' knowledge of core courses accurately. For example, some questions related to fashion fabrics needed to be reworded, so that they are clearer on the actual application of the fabric and characteristics. Also to better analyse students' performance in each core area, the number of questions was reduced, and an equal number of questions was included in each core area.

After the assessment exam was revised and finalised based on two pilot studies, this study was approved by the KSU Institutional Review Board (IRB) office, and the actual data for this study was conducted with junior Fashion Merchandising and Fashion Design students in Fall 2014. The assessment exam questions were finalised encompassing a total of 112 questions which included 99 core curriculum questions and 13 demographic questions, such as gender, age, and ethnicity. In addition, students' GPA and whether they were transfer students were added as the results of two pilot studies demonstrated that assessment data could be different between transfer and non-transfer students. A few more questions asking if students have taken core courses at KSU, attendance throughout a semester, and working hours per week were added as well. Data were analysed using SPSS (v. 22).

## Results

A total of 111 data were collected including 103 female students (92.8%), six male students (5.4%) and two students who did not respond to the gender item on the demographic portion of the questionnaire. Eighty-two percent of students (*n* = 91) were White/Caucasian followed by Black/African American (8.1%, *n* = 9), Asian/Pacific Islander (4.5%; *n* = 5), and Hispanic/Latin (2.7%, *n* = 3). Among those junior students, 33 students (29.7%) were Fashion Design major, 75 students (67.6%) were Fashion Merchandising major, and 3 students (2.7%) were double majoring in both Design and Merchandising. Most of the students indicated that their GPA was above 3.0 as 45% students (*n* = 50) responded their GPA range as 4.0 to 3.5 and 36% students (*n* = 40) indicated 3.4 to 3.0 followed by 16.2% (*n* = 18) 2.9 to 2.5, and 2.7% (*n* = 3) ranging 2.4 to 2.0.

About 18.9% of students (*n* = 21) indicated that they were transfer students. Most of the students (over 95%) indicated they had taken core courses at KSU with the exception of Apparel Analysis /Basic Construction. About 6% of students (*n* = 8) have taken Apparel Analysis/Basic construction at other institutions. Most of the students (64%, *n* = 71) responded that they have 1 to 2 absences and about 18% (*n* = 20) indicated that they do not miss any classes throughout the semester. In terms of working hours, 43.2% (*n* = 48) responded that they do not have a job and 23.4% (*n* = 26) indicated that they work 11 to 20 hours per week.

Results of this study revealed that less than 50% of students had correct answers for 18 questions out of 99 questions. The majority of these questions concerned basic knowledge of fabric (eight questions) and apparel analysis/construction (six questions). The rest of the questions that students did not have higher than 50% correct answers were two Fashion Fundamental, one Technology and one Visuals questions (Table 1).

**Table 1 Correction rate less than 50%**

| Subject | *n* | Correction Rate (%) | Subject | *n* | Correction Rate (%) |
|---|---|---|---|---|---|
| Fundamental | 24 | 21.60 | Fabrics | 40 | 36.00 |
| Fundamental | 39 | 35.10 | Fabrics | 23 | 20.70 |
| Technology | 25 | 22.50 | Visuals | 46 | 41.40 |
| Fabrics | 51 | 45.90 | Apparel Analysis | 53 | 47.70 |
| Fabrics | 52 | 46.80 | Apparel Analysis | 42 | 37.80 |
| Fabrics | 37 | 33.30 | Apparel Analysis | 48 | 43.20 |
| Fabrics | 54 | 48.60 | Apparel Analysis | 42 | 37.80 |
| Fabrics | 34 | 30.60 | Apparel Analysis | 50 | 45.00 |
| Fabrics | 50 | 45.00 | Apparel Analysis | 36 | 32.40 |

When SPSS ANOVA was conducted to compare Design and Merchandising students, 12 questions were significantly different in terms of the correction rate (Table 2). First, SPSS ANOVA test was done to find out which questions were answered significantly different between Design and Merchandising major students. Then, descriptive analysis was done to find out the correction rate for those questions. Design major students had higher correction rate than Merchandising students on eight questions that were related to Technology (e.g., correction rate Design = 75.80% vs Merchandising = 46.70%), Fabric (correction rate Design = 93.90% vs Merchandising = 68.00%), and Apparel Analysis (e.g., correction rate Design = 100% vs Merchandising = 64%). However, one Fundamental (correction rate Design = 60.60% vs Merchandising = 81.30%), one technology question related to Excel (correction rate Design = 51.50% vs Merchandising = 70.70%), one fabric question related to satin (correction rate Design = 48.50% vs Merchandising = 68%), and one Visuals question related to colour (correction rate Design = 30.30% vs Merchandising = 45.30%), Merchandising students answered better than Design students (Table 2).

**Table 2 Comparison between Design and Merchandising students**

| Subject | Major | *n* | Correction Rate (%) | F(*df*) |
|---|---|---|---|---|
| Fundamental | Design | 20 | 60.60 | 3.306* |
| | Merchandising | 61 | 81.30 | |
| Technology (Adobe) | Design | 25 | 75.80 | 3.251* |
| | Merchandising | 35 | 46.70 | |
| Technology (Adobe) | Design | 31 | 93.90 | 4.518* |
| | Merchandising | | 74.70 | |
| Technology (Adobe) | Design | 31 | 93.90 | 3.204* |
| | Merchandising | 54 | 72.00 | |
| Technology (Excel) | Design | 17 | 51.50 | 3.341* |
| | Merchandising | 53 | 70.70 | |
| Fabrics | Design | 31 | 93.90 | 4.760* |
| | Merchandising | | 68.00 | |
| Fabrics | Design | 16 | 48.50 | 3.158* |
| | Merchandising | 51 | 68.00 | |
| Visuals | Design | 10 | 30.30 | 3.856* |
| | Merchandising | 34 | 45.30 | |
| Apparel Analysis | Design | 33 | 100.00 | 7.804** |
| | Merchandising | 48 | 64.00 | |
| Apparel Analysis | Design | 25 | 75.80 | 6.452** |
| | Merchandising | 27 | 36.00 | |
| Apparel Analysis | Design | 32 | 97.00 | 6.677** |
| | Merchandising | 51 | 68.00 | |
| Apparel Analysis | Design | 21 | 63.60 | 7.584** |
| | Merchandising | 19 | 25.30 | |

*Note.* Design $n = 33$, Merchandising $n = 75$, *$p < 0.05$, **$p < .01$

When Transfer and Non-transfer students were compared, five questions were significantly different in terms of the correction rate. Non-transfer students had higher correction rate on one Fundamental (correction rate Transfer = 38.10% vs Non-Transfer = 72.20%) and two Visuals questions (correction rate Transfer = 38.10% vs Non-Transfer = 63.30%, correction rate Transfer = 90.50% vs Non-Transfer = 96.70%) compared to transfer students. Transfer students had higher correction rate on one of the Technology (correction rate Transfer = 81% vs Non-Transfer = 68.90% and one of the Fabrics questions (correction rate Transfer = 33.30% vs Non-Transfer = 30.00%) (Table 3).

**Table 3 Comparison between Transfer and Non-Transfer students**

| Subject | Transfer vs Non-Transfer | *n* | Correction Rate (%) | F(*df*) |
|---|---|---|---|---|
| Fundamental | Transfer | 8 | 38.10 | 10.035** |
| | Non-Transfer | 65 | 72.20 | |
| Technology | Transfer | 17 | 81.00 | 3.997* |
| | Non-Transfer | 62 | 68.90 | |
| Fabrics | Transfer | 7 | 33.30 | 4.573* |
| | Non-Transfer | 27 | 30.00 | |
| Visuals | Transfer | 8 | 38.10 | 5.484* |
| | Non-Transfer | 57 | 63.30 | |
| Visuals | Transfer | 19 | 90.50 | 7.711** |
| | Non-Transfer | 87 | 96.70 | |

*Note.* Transfer $n = 21$, Non-Transfer $n = 90$, *$p < 0.05$, **$p < .01$

Significant differences were found among groups, who had taken core courses at KSU in comparison to those who had not. Three questions found to be significantly different between those who took Fashion Fundamentals and Apparel Analysis course at KSU and those who did not. Students who took Fundamental course at KSU had significantly higher correction rate than those who had not. However, students who took Apparel Analysis at KSU had significantly lower correction rate than those who had Apparel Analysis curriculum instruction elsewhere.

Three questions with a correction rate that is significantly different from those who have taken Fashion Fundamentals at KSU and those who have not were one Fashion Fundamental (correction rate Taken Fundamental at KSU = 69.5% vs Not taken = 0%), one Fashion Visuals (correction rate taken Fundamental at KSU = 61.90% vs Not taken = 0%), and one Apparel Analysis/construction question (correction rate Taken Fundamental at KSU = 58.1% vs Not taken = 33.30%).

Three questions with correction rate that is significantly different from those who have taken Apparel Analysis course at KSU and those who have not were two Technology questions (correction rate taken Apparel Analysis at KSU = 54.9% vs. Not Taken = 71.4%; correction rate Taken Apparel Analysis at KSU = 56.9% vs. Not taken = 57.1%) and one Fabrics questions (correction rate Taken Apparel Analysis at KSU = 87.3% vs. Not taken = 100%). Students who took Apparel Analysis at KSU had significantly lower correction rate than those who did not.

Larger numbers of questions were significantly different between those students who have taken Introduction to Fashion Technology, Fashion Fabrics, and Fashion Visuals at KSU and those who did not ranging from seven to 11 questions. For most questions, students who took core curriculum at KSU had significantly higher correction rate than students who took core curriculum elsewhere. One Fundamental (correction rate Taken Fabrics at KSU = 20.2% vs. Not taken = 42.9%) and one Fabrics question (correction rate Taken Fabrics at KSU = 29.8% vs. Not taken = 42.9%) students who took Fabrics at KSU had significantly lower correction rate than those who did not take the course at KSU. The same Fundamental question also had significantly higher correction rate of students who did not take Visuals at KSU compared to those who did (correction rate Taken Visuals at KSU = 19.2% vs. Not taken = 57.1%).

Questions with a correction rate that was significantly different from those who had taken Fashion Visuals, Intro to Fashion Technology, and Fashion Fabrics at KSU compared with those who had not were mostly course-specific. However, one Visuals question was significantly different between those who took all three courses (Intro to Fashion Technology, Fashion Fabrics Fashion, and Visuals) at KSU and those who did not (correction rate Taken Technology at KSU = 61.5% vs Not taken = 14.30%; correction rate Taken Fabrics at KSU = 60.6% vs. Not taken = 28.6%; correction rate Taken Visuals at KSU = 61.5% vs. Not taken = 14.30%).

## Discussion

Research has found that learning retention is a major issue due to the fact that most recollection of content decreases by 60% after only twenty minutes of the instruction. With the fast nature of the fashion industry, it is a necessity that future fashion professionals have a firm grasp on the foundational/core knowledge pertinent to the field. Studies have shown that original learning and overlearning influence knowledge retention and transfer. Guided by those studies, the researchers administered an assessment to determine if the pedagogical original learning process and the overlearning opportunities experienced thus far by the sophomore students have been adequate in maintaining knowledge and skills learned in class.

Therefore, the purpose of this study was to assess the foundational knowledge and skills of fashion design and merchandising students to identify gaps in student learning for future curriculum improvement. By answering four research questions, this study found that the largest gaps in learning retention were the areas concerning basic knowledge of fabrics and apparel analysis. This result raises critical issues as these two subject areas are among the most important knowledge and skills required for fashion college graduates' future success in the industry. For the range of career paths within the fashion industry from being a buyer, to a visual merchandiser, to a technical designer, knowledge concerning fabric and apparel analysis are embedded in the daily job responsibilities. Most of the time, the product is composed of 95% or more fabric, and a buyer must know which fabrics are great sellers for the brands. A visual merchandiser must understand how fabrics drape and hang in order to make the best decision to display the product. And it is imperative for technical designers to know that the measurements for the same size trousers in corduroy will be different for trousers in a lightweight suiting.

Hence, it is suggested from this study that FDM core curriculum and teaching approach, particularly related to fabrics and apparel analysis subjects, be revised offering a variety of overlearning opportunities to assist students in retaining this core knowledge. Creative minds need variety in their learning processes (Zimmerman, 1992).

The findings of this study showed that design students answered correctly more often than merchandising students on most of the questions. Design students fared better on exam questions related to Fabrics, Visuals, Technology, and Apparel Analysis because they experience overlearning opportunities. The original learning situation was the same for both design and merchandising, however knowledge such as fabric selection and colour theory are being repeated for the design students within almost every project they complete. Also, design students get to apply this knowledge multiple times throughout their educational career. Perhaps, fashion merchandising curriculum can be revised further to simulate similar learning actives as design curriculum by applying knowledge in multiple courses to improve student learning in core subject areas.

It was found from this study that non-transfer students mostly did better than transfer students with the exception of two questions related to technology and fabric. This makes sense as most of the assessment questions were derived from core foundational courses exam questions that were developed in KSU. However, it would be important to closely re-examine those subjects where transfer students retain better than non-transfer students to find out where the core knowledge retained has lost in KSU curriculum.

The data revealed that a small number of questions had a significantly different correction rate between students who took fundamental and apparel analysis at KSU and those who did not. Interestingly, students who took Fundamental at KSU had significantly higher correction rate, but those who took Apparel Analysis at KSU had significantly lower correction rate on three questions. Again, it will be important to examine those Apparel Analysis questions closely in line with the course content to improve student learning and knowledge retention.

A large number of questions had significantly different correction rates between students who took Fashion Visuals, Intro to Fashion Technology, and Fashion Fabrics at KSU versus those who have not taken those courses at KSU. Students who took those courses at KSU did better than those who did not. One Visuals question had a particularly higher correction rate than those who took those courses elsewhere. It would be important to examine those questions to see if it is too subject-specific rather than general core knowledge and revise assessment exams accordingly for the future. However, in one Fundamental and one Fabric question, students who did not take Fabrics and Visuals at KSU did

better. It would be also critical to examine those questions and find out why students who took those courses at KSU did not retain this knowledge and revise curriculum accordingly.

## Limitations and suggestions for future studies

Some statistical differences were found among students who took FDM core curriculum at KSU versus those who took core curriculum elsewhere, but those groups are not comparable as the number of students who took core courses at KSU were much larger than those who did not. Therefore, longitudinal studies can be developed in the future to accurately compare those groups. This study used an assessment exam that was developed from exams used in KSU core courses, which may not be the foundation knowledge or skills needed for working in the fashion industry work place. Therefore, more subject specific teaching strategies and curriculum assessment exam should be developed to help fashion college students to retain their core basic knowledge for working in the industry.

In order to ensure that the FDM assessment and similar compressive exams lead to enhancement in learning, faculty teaching core subjects will need to work more closely together to structure curriculum promoting overlearning which will result in skill/knowledge transfer. Particularly for the faculty at KSU, developing a network of communication which endorses transparency amongst core subject teachers and curriculum will be imperative in developing an overlearning and transfer atmosphere.

The current research offers a model that other educators can utilise in hopes of enhancing curriculum for future leaders in the fashion industry. The success and happiness of the students is a major reflection on the institution they received training from. Therefore, by offering the best educational experience, the institution will also reap good fortune.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# An exploration of health and household saving behaviour

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## Abstract

*Health has not generally been a focus of theoretical and empirical work on motivations to save. We use a life-cycle saving framework and data from the 2013 US Survey of Consumer Finances to investigate the relationship between health and household saving behaviours. Using a method presented by Jackson and Lindley (1989), we decompose the existing difference in saving between households in poor/fair and good/excellent health, allowing the impact of the explanatory variables in the model to differ between those in poor or fair health and those in good or excellent health. This allows us to better understand the link between health and saving for the future and what factors are behind the difference in saving behaviours between those in poor/fair health and those in better health. The results indicate that the difference in saving behaviours between households in poor/fair and good/excellent health comes from two sources: (a) differences in the relationship between independent variables and saving for the two groups, and (b) poor/fair health in and of itself. We find that the effects of private health insurance, being separated/divorced, and income uncertainty on saving behaviours differ significantly for households in poor/fair health and those in good/excellent health. The results show that those in poor health are less likely to save, which has implications for financial security. Future research could further determine whether this is because medical expenditures are higher, income is lower, or households choose not to save because they do not think they will live much longer. It is important to include health in discussions of personal finance among Home Economics educators and researchers.*

**KEYWORDS: HEALTH, SAVING BEHAVIOUR, INCOME UNCERTAINTY, HEALTH INSURANCE**

## Introduction

With the recent recession and low levels of saving among Americans, many researchers have begun to investigate saving behaviours in the United States. One variable that has received less attention in studies on saving is health status (Smith, 1999), although it has been shown to have a significant link with saving behaviours (e.g., Davies, 1981; Palumbo, 1999; Fisher & Anong, 2012). Researchers have found that health affects total wealth (Smith, 1995; Poterba, Venti, & Wise, 2000; Wu, 2003), but have only recently started to focus on the effect of health on economic resources (Babiarz, Widdows, & Yilmazer, 2012).

Although health is believed to have a negative relationship with consumer economic well-being, there is limited research on the relationship between health and the act of saving (Smith, 1999). The

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purpose of the present study is thus to explore the relationship between health and saving behaviours. Following on the paper by Fisher and Anong (2012), which explored the relationship between health and household saving behaviour, we utilise the methods of Jackson and Lindley (1989) to decompose and further investigate this relationship.

## Framework

When considering the intertemporal allocation of money, time, and effort, economists often follow the life-cycle framework (Browning & Crossley, 2001). The life-cycle framework provides a model of saving over the lifetime (Modigliani & Brumberg, 1954), and is simple and intuitively attractive (Attanasio & Banks, 2001). According to this framework, individuals follow a hump-shaped income profile over the lifetime, with income starting low and then rising with experience and tenure. At retirement, there is a dramatic drop in income. Income changes across one's lifetime, but individuals smooth consumption across the life cycle, with consumption staying flat or slightly increasing or decreasing. Consumption is dependent on the relationship between the discount factor and the interest rate.

Life-cycle theory can be used to consider important policy questions such as how societies should provide for the increasing number of elderly individuals (Deaton, 2005). In its most general form, the life-cycle model states that individuals make sequential decisions to achieve a coherent goal using the available information as best they can (Browning & Crossley, 2001). According to Chang (1994), households at different life cycle stages, with varying economic and demographic characteristics, should be motivated to save or dissave depending on their practical needs and long-term financial plans. In this paper, we investigate how the saving decisions of households are related to health using the life cycle model of saving as the framework.

## Literature review

An individual's health affects his or her saving behaviours (Davies, 1981; Palumbo, 1999). Kennickell and Lusardi (2005) argued the importance of including health risks in studies on saving; however, relatively little is known about the relationship between health and general saving behaviours (Smith, 1999). Studies show that health affects total wealth accumulation (Poterba et al., 2000; Smith, 1995; Wu, 2003), with those in excellent health holding substantially higher levels of wealth than those in poor health (Smith, 1999). Researchers have focused on the effect of socioeconomic status on health, but researchers have only recently started to investigate the relationship from the opposite direction—the effect of health on economic resources (Smith, 1999)—as well as the linkages between labour supply, health, and consumption (Browning & Crossley, 2001).

Although studies show that health is negatively related to consumers' economic well-being, there is limited research on the relationship between health status and the act of saving (Smith, 1999). The relationship between economic resources and health is complex, and there are continued debates on why low economic status leads to poor health, with limited input from economists in these studies (Smith, 1999). Economists have more recently started to investigate the impact of poor health on economic resources. The connection between wealth and health has been inadequately explored partly because of a lack of data that combines information on health and economic variables. Although the Survey of Consumer Finances (SCF) has limited variables on health, the data set offers reliable data on an array of financial measures in addition to several variables on health status and can be used to explore the relationship between poor health and saving behaviours.

Health can affect economic well-being in a variety of ways. Poor health can restrict the ability to earn income or accumulate assets by reducing time in the labour market or by increasing medical expenses (Smith, 1999). The prospect of high medical expenses is the main way in which health risks have been incorporated into life-cycle models in previous studies (Lillard & Weiss, 1996; Palumbo, 1999; Smith, 1999). Smith (1999) states that out-of-pocket medical costs are modest for the average person and that costs are relatively insensitive to the onset of illnesses, even those that are serious. The small probability of an expensive outcome related to health care indicates that attitudes toward risk and uncertainty could be essential for better understanding saving behaviour (Smith, 1999).

Health could also affect savings by reducing the ill person's time in the labour force; however, other household members may increase their time in the labour force to compensate for the reduction in income (Smith, 1999). Health status is also likely to affect the marginal utility of consumption

(Browning & Crossley, 2001; Smith, 1999). If the marginal utility of consumption declines with poor health, individuals may wish to increase consumption when they are healthy as compared with during the years they are ill. It is also possible that households adjust to a decline in health by reducing financial transfers to heirs (Smith, 1999).

Several researchers have shown that health is an important determinant of wealth and savings among elderly households (Babiarz et al., 2012; Diamond & Hausman, 1984; Kotlikoff, 1989; Smith, 1999). Diamond and Hausman (1984) found a negative relationship between being in poor health and retirement saving. Several studies show that age, marital status, and the number of members of a household have significant relationships with household saving behaviours. For example, Bosworth, Burtless, and Sabelhaus (1991) found that saving rates increase until an individual reaches the mid to late 60s in age, after which the saving rate declines. Married couples who do not have children have the highest saving rates in the population (Avery & Kennickell, 1991; Bosworth et al., 1991). Larger household size is associated with lower levels of saving.

Yuh and Hanna (2010) found that having an income higher or lower than what is normal for the household in previous years affects saving behaviours. Others have found that risk tolerance has a strong relationship with saving behaviours (Fisher, 2010a), as does income uncertainty (e.g., not having a good idea of income in the next year, Fisher, 2010b). Lusardi (1998) states that life expectancy (the age that the respondent expects to live to) accounts for the variation in wealth among households. Demographics and household wealth are commonly used determinants of saving in household level empirical studies, such as wealth, income, planning horizon, race, and education (Aghevli, Boughton, Montiel, Villanueva, & Woglom, 1990; Masson, Bayoumi, & Samiei, 1995).

Poor health has also been found to have a negative relationship with saving in models focused on uncertainty, saving motives, and horizon (Fisher, 2010b; Fisher & Montalto, 2010). Fisher (2010a) found that poor health decreases the likelihood of short-term saving for women, but is not a significant variable in the model for men. Babiarz et al. (2012) found that households with financial problems linked to health problems increased their unsecured debt rather than assets and that this debt remained on their balance sheets for extended periods of time.

## Methods

### Sample

The data used in this study come from the 2013 US Survey of Consumer Finances (SCF), which is a nationally representative data set providing information on household assets, liabilities, and self-reported financial behaviours. We remove households with a retired respondent and/or spouse because their saving behaviours have been shown to differ from those of non-retired households. The total sample size in the present study is 4,779 households.

Logistic regression is used to estimate the empirical model. When using imputation techniques to fill in missing data, such as in the SCF, there is extra variability in the data (Montalto & Sung, 1996). This extra variability can be adjusted for in empirical estimates by using *repeated-imputation inference* (RII) techniques that estimate this variability and lead to more valid inference and tests of significance (Montalto & Sung, 1996; Rubin, 1987). In the present study, RII techniques are used for the logistic regression analyses.

### Empirical Model

We use a measure of saving as the dependent variable, with the dichotomous dependent variable (saver) taking a value of 1 if the household: (a) saves regularly by setting aside a certain amount each month or saving the income of one spouse, and (b) had spending that was less than income over the previous year. The explanatory variables include health and health insurance variables, life cycle variables, risk and uncertainty variables, a bequest motive variable, and socioeconomic controls.

The health and health insurance variables include health status (good to excellent—reference category, and poor to fair), if the respondent and/or spouse/partner (if present) smoke (yes/no), life expectancy (age that the respondent expects to live to), and health insurance status (not all household members have health insurance—reference category, all household members have private health insurance, and all household members have government health insurance). The life cycle

variables include age, marital status, and number of household members. The risk and uncertainty variables include having an income higher or lower than normal over the previous year, risk tolerance, and income uncertainty (not having a good idea of income in the next year). The bequest motive is a dummy variable based on whether the household lists leaving a bequest as one of their most important reasons for saving and spending. Socioeconomic controls include wealth, income, planning horizon, race, and education.

The first hypothesis investigated in the present study is that the effects of health insurance, life cycle, risk and uncertainty, bequest motive, and socioeconomic controls differ between households where a respondent and/or spouse or partner (if present) is in poor or fair health and those where the respondent and/or spouse or partner (if present) are in good to excellent health. A likelihood ratio test is used to test the joint statistical significance of the fair to poor health indicator variable and the set of interaction terms (all independent variables interacted with the fair/poor health indicator), and the chi-square statistics for individual interaction terms are used to identify specific variables that differ between the poor to fair health and good to excellent health groups. The second hypothesis proposed in the present study is that differences in saving behaviours between poor to fair health, and good to excellent health households are due to differences in the individual determinants of saving, not to health alone. In other words, we hypothesise that poor to fair health and good to excellent health households behave differently in regards to saving. For a full description of the statistical methods used, see Jackson and Lindley (1989).

## Results

### Descriptive statistics

About 32% of households in the overall sample are categorised as savers (see Table 1). Only about 19% of households with a respondent and/or spouse in poor/fair health are savers, as compared with about 37% of those in good to excellent health. About 70% of households in the sample have a respondent and/or spouse or partner (if present) in good to excellent health, while about 30% have a respondent and/or spouse or partner (if present) in poor or fair health.

About 17% of households in the good to excellent health group do not have health insurance as compared with about 18% of the poor to fair health group. For about 35% of the poor to fair health group, all household members have government health insurance (e.g., Medicare, Medicaid, VA) while less than 16% of the good to excellent health group report having all household members covered by government health insurance. The majority of households (67%) in the good to excellent health group have private health insurance that covers all household members, as compared with only about 47% of the poor to fair health group. More than one-third of the poor to fair health group smokes (37%; respondent and/or spouse or partner, if present) as compared with less than one quarter (21%) of the good to excellent health group.

Not unexpectedly, the age of the poor to fair health group is higher (47.8 years) as compared with the good to excellent health group (43.5 years). Household size for both health groups is about 2.6. The risk tolerance distributions of households in the two groups are significantly different, with about 55% of those in poor to fair health reporting low-risk tolerance as compared with only about 38% of those in good to excellent health. About 15% of households with a respondent and/or spouse or partner (if present) in poor to fair health have above average to substantial risk tolerance, while about 22% of those in good to excellent health report above average to substantial risk tolerance.

A significantly higher proportion of households in poor to fair health experience income uncertainty (40%) as compared with the good to excellent health group (35%). The life expectancy of households with a respondent and/or spouse in poor to fair health is significantly lower at 79 years as compared with 85 years for the good to excellent health group. Wealth and income were significantly different for the two groups, with both being much higher for the good to excellent health group as compared with the poor/fair health group. About one-half of the poor to fair health group (49%) had a planning horizon (for saving and spending) of the next few months to next year as compared with about 40% of the good to excellent health group. The education distributions were more heavily weighted toward higher levels of education for the good to excellent health group, and more heavily weighted toward the lower levels of education for the poor to fair health group.

**Table 1 Characteristics of sample and by health**

| Variable | Total Sample (*N* = 4,779) | Good/Excellent Health (n = 3,260) | Poor/Fair Health (n = 1,519) |
|---|---|---|---|
| Saver *** | 31.79% | 37.16% | 19.12% |
| **Health status** | | | |
| Good to excellent | 70.23% | - | - |
| Poor to fair health | 29.77% | - | - |
| **Health insurance status** | | | |
| No health insurance*** | 17.32% | 17.08% | 17.88% |
| Govt health insurance*** | 28.74% | 15.73% | 34.77% |
| Private health insurance*** | 12.25% | 67.19% | 47.35% |
| Smoke*** | 25.89% | 21.04% | 37.34% |
| Age*** | 44.8 years | 43.5 years | 47.8 years |
| **Marital status** | | | |
| Married** | 46.70% | 48.00% | 43.63% |
| Living with partner*** | 10.88% | 9.69% | 13.69% |
| Separated/divorced | 17.93% | 17.23% | 19.58% |
| Widowed*** | 4.62% | 3.84% | 6.44% |
| Never married*** | 19.88% | 21.24% | 16.67% |
| Number of household members*** | 2.6 people | 2.6 people | 2.6 people |
| Income higher than normal | 7.86% | 8.16% | 7.14% |
| Income about normal* | 70.68% | 71.58% | 68.58% |
| Income lower than normal** | 21.45% | 20.26% | 24.27% |
| **Risk tolerance** | | | |
| Above average to substantial*** | 19.85% | 22.04% | 14.67% |
| Average*** | 37.26% | 40.38% | 29.89% |
| Low*** | 42.89% | 37.58% | 55.44% |
| Income uncertainty*** | 36.32% | 34.56% | 40.49% |
| Life expectancy*** | 82.6 years | 84.4 years | 78.9 years |
| Bequest motive | 9.36% | 9.08% | 10.01% |
| Wealth*** | $467,139 | $576,571 | $208,960 |
| Income*** | $90,748 | $105,822 | $55,183 |
| **Planning horizon** | | | |
| Next few months to next year*** | 42.86% | 40.16% | 49.24% |
| Next few years | 25.42% | 26.09% | 23.82% |
| Next 5 years or longer*** | 31.73% | 33.75% | 26.94% |
| **Race** | | | |
| Non-Hispanic White*** | 64.92% | 66.63% | 60.88% |
| Non-Hispanic Black* | 14.98% | 14.16% | 16.91% |
| Hispanic* | 15.05% | 14.26% | 16.92% |
| Other | 5.05% | 4.95% | 5.29% |
| **Education** | | | |
| Less than high school*** | 10.18% | 7.11% | 17.42% |
| High school*** | 29.60% | 26.22% | 37.58% |
| Some college* | 19.51% | 18.69% | 21.45% |
| College graduate*** | 40.70% | 47.98% | 23.54% |

*Note.* * $p < .05$, ** $p < .01$, *** $p < .001$

## Logistic regression results

The logistic regression results for the interaction model (shown in Table 2) indicate that there are significant differences in the determinants of saving for those in poor to fair health and those in good to excellent health. This supports the first hypothesis that the effects of the independent variables

on saving behaviours differ between those in poor to fair health and those in good/excellent health. The joint test of the poor health indicator variable and the set of interaction terms is statistically significant ($p < 0.001$). In the model that includes the poor/fair health indicator variable but not the interaction terms, the indicator is significant and negative ($p < 0.0001$), which indicates that those in poor to fair health are less likely than those not in good to excellent health to save.

**Table 2 Logistic regression results**

| Variable | Coefficient | Odds ratio | *p*-value |
|---|---|---|---|
| Health status (good/excellent) | | | |
| Poor/fair health | -0.819 | 0.441 | 0.343 |
| Health insurance status (no health insurance) | | | |
| Government health insurance | -0.466 | 0.628 | <0.001 |
| Private health insurance | 0.457 | 1.579 | <0.001 |
| Smoke | -0.404 | 0.668 | <0.001 |
| Age | -0.001 | 0.999 | 0.758 |
| Marital status (married) | | | |
| Living with partner | -0.015 | 0.985 | 0.923 |
| Separated/divorced | -0.468 | 0.626 | <0.001 |
| Widowed | -0.254 | 0.776 | 0.264 |
| Never married | -0.586 | 0.557 | <0.001 |
| Number of household members | -0.116 | 0.890 | <0.001 |
| Income compared to normal (normal) | | | |
| Higher than normal | -0.034 | 0.967 | 0.779 |
| Lower than normal | -0.323 | 0.724 | 0.003 |
| Risk tolerance (average) | | | |
| Above average to substantial | 0.088 | 1.092 | 0.324 |
| Low | -0.494 | 0.610 | <0.001 |
| Income uncertainty | -0.395 | 0.674 | <0.001 |
| Life expectancy | 0.001 | 1.001 | 0.906 |
| Bequest motive | 0.049 | 1.050 | 0.698 |
| Wealth | 0.001 | 1.001 | 0.090 |
| Income | -0.001 | 0.999 | 0.171 |
| Planning horizon (next few months to next year) | | | |
| Next few years | 0.259 | 1.296 | 0.013 |
| Next 5 years and longer | 0.640 | 1.896 | <0.001 |
| Race (non-Hispanic white) | | | |
| Non-Hispanic Black | 0.001 | 1.001 | 0.999 |
| Hispanic | 0.014 | 1.014 | 0.918 |
| Other | -0.004 | 0.996 | 0.980 |
| Education (less than high school) | | | |
| High school | 0.371 | 1.449 | 0.086 |
| Some college | 0.302 | 1.353 | 0.179 |
| College graduate | 0.703 | 2.020 | 0.001 |
| Interaction terms | | | |
| Poor health * Government health insurance | -0.035 | 0.966 | 0.873 |
| **Poor health * Private health insurance** | 0.598 | 1.818 | 0.005 |
| Poor health * Smoke | 0.170 | 1.185 | 0.414 |
| Poor health * Age | -0.012 | 0.988 | 0.137 |
| Poor health * Living with partner | 0.299 | 1.349 | 0.316 |
| **Poor health * Separated/divorced** | 0.477 | 1.611 | 0.086 |
| Poor health * Widowed | 0.575 | 1.777 | 0.226 |
| Poor health * Never married | 0.219 | 1.245 | 0.506 |

| Variable | Coefficient | Odds ratio | *p*-value |
|---|---|---|---|
| Poor health * Number of household members | -0.005 | 0.995 | 0.947 |
| Poor health * Higher than normal income | 0.194 | 1.214 | 0.479 |
| Poor health * Lower than normal income | -0.104 | 0.901 | 0.654 |
| Poor health * Above average to substantial risk tolerance | 0.350 | 1.419 | 0.110 |
| Poor health * Low risk tolerance | 0.185 | 1.203 | 0.376 |
| **Poor health * Income uncertainty** | 0.356 | 1.428 | 0.060 |
| Poor health * Life expectancy | 0.002 | 1.002 | 0.821 |
| Poor health * Bequest motive | 0.249 | 1.283 | 0.367 |
| Poor health * Wealth | 0.000 | 1.000 | 0.724 |
| Poor health * Income | 0.000 | 1.000 | 0.884 |
| Poor health * Next few years horizon | 0.127 | 1.135 | 0.573 |
| Poor health * Next 5 years or longer horizon | 0.296 | 1.344 | 0.149 |
| Poor health * Non-Hispanic Black | 0.001 | 1.001 | 0.998 |
| Poor health * Hispanic | -0.027 | 0.973 | 0.920 |
| Poor health * Other | -0.346 | 0.708 | 0.385 |
| Poor health * High school | -0.227 | 0.797 | 0.523 |
| Poor health * Some college | -0.154 | 0.857 | 0.685 |
| Poor health * College graduate | -0.171 | 0.843 | 0.641 |

*Note.* *Bold indicates an interaction term that is significant at the $p < 0.10$ level.

The decomposition of the between-group differences indicates that there is a significant constant effect ($p = 0.032$) as well as a statistically significant coefficient effect ($p < 0.001$). This indicates that the difference in saving behaviours between those in poor to fair health and those in good to excellent health is from differences in the effect of individual variables on the likelihood of saving and also from being in poor health in and of itself. Thus, support for the second hypothesis, which posits that differences in saving behaviours between the two health groups result from differences in the individual determinants of saving, and not from health alone, is mixed.

Households with a respondent and spouse or partner (if present) who have private health insurance are significantly more likely to be savers ($p < 0.001$), while having government-sponsored health insurance is associated with a significantly lower likelihood of saving. Having private health insurance makes a household 1.6 times as likely to be a saver. Having a saving horizon of five years or longer is associated with a significantly higher likelihood of saving ($p < 0.001$). This longer saving horizon makes households 1.9 times as likely to save. Having a college degree is also associated with a significantly higher likelihood of being a saver ($p = 0.001$), with these households being 2.02 times as likely to save.

Households with a respondent and/or spouse or partner (if present) who smokes are significantly less likely to save ($p < 0.001$). Having a respondent and/or spouse who smokes makes the household 0.7 times as likely to be classified as a saver. Households with a separated/divorced or never married respondent are significantly less likely to be savers as compared with household heads who are married ($p < 0.001$ for both variables). Other variables that lead to a significantly lower likelihood of saving include having a greater number of household members, lower income than normal, low-risk tolerance, and income uncertainty.

The model including interaction terms also provides information on the effect of coefficients that differ significantly for the poor to fair health and good to excellent health groups. Income uncertainty differs in its effect on the likelihood of saving for the poor to fair health and good to excellent health groups. Being in poor health and having income uncertainty is associated with a significantly lower likelihood of saving. Having private health insurance and being in poor health is associated with a significantly higher likelihood of saving. Interestingly, being separated/divorced and in poor health is also associated with a significantly higher likelihood of saving.

## Conclusion

In this study, we investigated the relationship between health status and household saving. The results indicate that households with a respondent and/or spouse (if present) in poor health are less likely to save regularly than those without such an individual in poor health. Poor health leads to a greater decrease in the likelihood of saving as compared with fair to excellent health, indicating that households with a respondent and/or spouse (if present) in poor health may face greater health care expenditures or experience a greater loss of income. This finding is in agreement with Smith (1999), who states that savings may fall as current health deteriorates because poor health reduces current income or increases consumption or medical expenses. Further research on why poor health is associated with a lower likelihood of saving save is necessary, such as whether medical expenditures are higher, income is lower, or households choose not to save because they don't think they will live much longer.

The results show an interesting connection between health insurance and savings behaviour, with private health insurance being associated with an increased likelihood of saving as compared with those who do not have any health insurance, but no effect for government provided health insurance. Means-tested government assistance programs, such as Medicaid, have asset requirements for eligibility and thus provide a disincentive for asset accumulation (Scholz & Levine, 2003). In the present study, various government health insurance programs were grouped into one variable, so further exploration of these various types of government health insurance programs may be required. Future research separating out the different types of health insurance could provide more information on this topic.

Households with a respondent and/or spouse or partner (if present) who smokes were shown to be significantly less likely to save, indicating that smokers may focus more on the present than the future. Those with a longer life expectancy were significantly more likely to save, indicating that the belief that one will live longer may be associated with an increase in saving.

In contrast to previous studies indicating racial and ethnic differences in saving behaviours, the present results do not show a significant difference in saving among different racial/ethnic groups after adjusting for all other variables in the model. Thus, researchers may need to consider factors such as health status, health insurance status, and smoking behaviour in models of saving. A focus on improving and maintaining health may be helpful in reducing the economic disparities across racial/ethnic groups.

The results also fail to provide evidence of a relationship between income and saving, which is in contrast to previous studies supporting a link between income and saving. Including income in the model as a categorical variable rather than as a continuous variable could lead to different results. A limitation of the present study is the use of a dichotomous measure of saving, and future studies based on the dollar amount saved could provide richer information.

An interesting finding in the present study is the differing effect of income uncertainty on saving for the poor/fair health and good/excellent health groups. Those in poor/fair health who experience income uncertainty are significantly less likely to save. Further investigation of the relationship between income uncertainty, health status, and economic well-being would likely provide useful information.

The current results regarding the relationship between health and saving show that poor health status is associated with a lower likelihood of saving. A large body of research shows that health and economic well-being are strongly related, but further investigation is needed. The results of the current study indicate that health status is an important component of economic well-being and should be included in studies on consumers' financial behaviours. As much is unknown about the links between health, health insurance, and saving behaviours, continued research on the topic is necessary. Individuals who are in poor health need special attention from educators and financial counsellors on how to plan and secure their finances appropriately while managing health-related expenses.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

REVIEW ARTICLE

# Hygiene issues in domestic laundry care practices

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## Abstract

*Laundry hygiene is often a forgotten area of household hygiene because, by its very nature, laundry areas and washed garments are perceived as clean. In general, visual assessment of a garment is used to assess the quality of cleaning processes and any garment free from soil and stains are perceived as clean. However, it is important to realise that any garment which appears to be physically clean may not be hygienically clean. Garments and household linens are often found to be contaminated with infectious micro-organisms which are not visible to naked eye and thus, may serve as a potential source of spread of infections in a household setting. Ensuring hygiene during domestic laundry is very important as microbial and fungal transfer can occur between infected and non-infected clothing during washing. Research studies have found viable micro-organisms on environmental surfaces, including washed and unwashed clothing, and places that come in contact with laundry like washing machines and so on. Under certain conditions, clothing contaminated with pathogenic organisms during laundry may present a health risk to the wearer and to the laundry handler. The present article is a comprehensive literature review of hygiene issues and risk of spread of infection through domestic laundry practices and how these can be minimised or reduced effectively to ensure hygiene of clothing and household linens during laundry.*

**KEYWORDS: CLOTHING, CONSUMERS, LAUNDRY, HYGIENE, INFECTION**

## Introduction

Garments and textiles that have been worn or used in the household are washed for various reasons. Firstly, to remove visible soils and stains and restore the aesthetic appeal of the item and secondly to eliminate malodours accumulated while using the textiles. In addition to these two aspects, the consumers' desire to assure hygienic processing of laundry has to be considered. Hygiene can generally refer to a whole range of measures, which protect health and well-being and improve the quality of life. The main role of hygiene in any sector is to protect people and animals from disease caused by infectious or toxic micro-organisms: bacteria, fungi, viruses and sometimes protozoa (A.I.S.E., 2004). Laundry hygiene is often a forgotten area of household hygiene because, by its very nature, laundry areas are perceived as clean. However, laundry hygiene is very important as microbial and fungal transfer can occur between infected and non-infected clothing. Many research studies have found that organisms such as *Staphylococcus aureus* (*S. aureus*), *Escherichia coli (E. coli)*, *Mycobacterium fortuitum* and viruses like *Rotavirus* and *Hepatitis A virus* present in the garments

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survived the laundry wash and contaminated other garments in the wash (Gerba, Watson, & Kennedy, 2001; Linke, Gemein, & Koch, 2011).

The awareness of consumers that laundering represents one of the critical microbiological hot spots in the household is low. In earlier times, garments were washed at high temperatures and in a highly alkaline medium along with the use of strong bleaches. The use of high thermal and chemical energy not only removed the visible soil and stain from the garments but at the same time also killed the micro-organisms present in the garment. However, laundry practices have changed over the period of time. To answer the issue of sustainability, the modern laundry practices involve the use of low temperature, low water volumes, biodegradable detergents, less alkaline medium and almost no use of hypochlorite bleach. This is because; the primary aim of modern cleaning methods is the removal of soil and stains in the most sustainable manner. However, these changes in practice, have stressed the conditions for appropriate hygiene achieved in domestic laundering (Terpstra & van Kessel, 2003). The modern cleaning processes focus mainly on best soil and stain removal and members of households assess the quality of cleaning processes by visual inspection. Another aim of laundry may be the removal of unpleasant odours and restoration of the original appearance of the textiles. But it is important for consumers to realise that the achievement of proper hygiene is an important aspect of domestic laundry and that any garment which looks clean may carry infectious micro-organisms which are not visible to the naked eye.

The consumers should be made aware that infectious disease may not only cause with the direct contact between sick persons and potential victims but may also be transferred from contact with an environment in which there is no obvious direct contact between source and victim (Terpstra, 2001). One such major source of contamination could be clothing and household linens.

## Clothing and household linens—potential vehicles for spread of infection

Many garments and textiles may be contaminated with pathogens during normal use, for example dermatophyte fungal strains such as *Tinea pedis* (responsible for athlete's foot) and *Tinea corporis* (responsible for ringworm) on socks, enteric or genital bacteria such as *Salmonella*, *Shigella*, *Campylobacter*, *E. coli* and *Clostridium difficile* (*C. difficile)* on underwear, or anthropogenic or food-borne pathogens on towels. The viruses which are mainly relevant in this context may be internally secreted viruses such as *Norovirus*, *Rotavirus*, *Adenovirus* and *Astrovirus*. It also includes respiratory (cold and flu) viruses such as *Rhinovirus*, *Influenza virus*, *respiratory syncytial virus* and so on, as well as dermal or genital viruses like *Herpes* or *Papillomaviruses* (Heinzel, Kyas, Weide, Breves, & Bockmühl, 2010). These contaminated clothing and household linens (sheets, pillows, towels, etc.) have the potential to act as vehicles for the spread of infection in home and everyday life settings. There exists a wide amount of literature on infection outbreaks associated with bacterial, viral and fungal strain. In a study by Payne (1959), infected blankets and dust were found to be the main cause of epidemic affecting 128 patients, of *Staphylococcal cystitis* in a gynaecological hospital ward. In another study, mentally retarded men in a long stay in hospital showed a higher incidence of *Trichophyton rubrum* along with a common incidence of *Trichophyton interdigitale*. The study revealed that a significant number of crippled patients who had never walked acquired *Tinea pedis* (English, Wethered, & Duncan, 1967). The appropriate fungus was isolated before laundering from the worn socks of three patients with *T. interdigitale* infection and of one patient with *T. rubrum* infection. After laundering the fungus was recovered from the socks of one of the patients with *T. interdigitale* infection. In view of the failure of laundering to eliminate the fungus from worn socks, it was suggested that infected socks were the most important route of cross-infection among the crippled patients. Birch et al., (1981) in their investigation of a maternity unit found that 44% of umbilical swabs from neonates contained an unusual serotype of *Bacillus cereus*. On further investigation, the same serotype could be isolated from air samples, the hands of members of staff and clean nappies from the hospital laundry. It was found that the nappies appeared to be the primary vehicle of *Bacillus cereus* dissemination among the infants. Barrie, Wilson, Hoffman and Kramer (1992) reported 2 hospital patients who developed *Bacillus cereus meningitis* following neurosurgery. During the subsequent investigation into the source of the infection, linen was found to be heavily contaminated with *B. cereus* during laundry. An investigation of an outbreak of streptococcal infection associated with a maternity unit was conducted by Brunton (1995). On each occasion, investigations were carried out, which indicated that babies were being infected very shortly after birth. The infection team decided to look at the laundering of the vests usually given to new-born children. Investigation of the laundry and in particular the hot air dryers revealed extensive

contamination with the MT type of *Streptococcus pyogenes* involved in the outbreak. After all babies' vests had been autoclaved the outbreaks ceased. St Sauver, Khurana, Kao and Foxman (1998) studied hygienic practices and the prevalence of respiratory illness in children attending daycare homes. Never or rarely washing hands by both children and care givers was associated with a higher frequency of respiratory illness in both family and group daycare homes. Using shared cloth towels rather than individual paper towels and washing of sleeping mats less than once a week was also associated with a higher frequency of upper respiratory infection. Ossowski, Duchmann and Boslet (1999) reported that for people with vaginal candidiasis, tight-fitting garments may become contaminated and can cause re-infection after successful therapy. Similarly, in developed countries, *T. rubrum* accounts for 70% of all dermatophytoses (including athlete's foot) in humans. According to Hammer, Mucha and Hoefer (2010), textiles (including socks and stockings) in direct contact with affected skin are major pathogen carriers and only a few viable spores are required for skin.

All these research publications indicate that clothing and lines can also be significant vehicles for the spread of infection when other more common sources of infections have been ruled out. Thus, correct laundering procedures of contaminated clothing and linens are an important measure for preventing health-acquired infections (Brunton, 1995).

## Sources of contamination of clothing and household linen

The garments and household linen in a household setting may get contaminated from various sources. These sources can be classified as primary/direct sources of contamination and secondary or indirect sources of contamination.

### Primary sources

Within the home, the primary sources of contamination on clothing are from the wearer's own body flora through direct contact with human body. Data presented by Bloomfield, Exner, Signorelli, Nath, and Scott (2011) show that an infected person can shed a large number of enteric pathogens like *Hepatitis A virus*, *Norovirus*, *Rotavirus*, *Salmonella* and *E. coli* in their faeces. Gibson, Rose and Haas (1999) through their study on American population estimate that, of the 100 to 500 g of faeces excreted per day by the average person, approximately 0.1 g of residual faecal material remains on the undergarment of any person. There is a lack of similar data about other countries; however similar trends may also be expected in the other parts of the world. According to the data published by Aiello, Larson and Sedlak (2008) people who carry *S. aureus* can shed the organism in large numbers during normal daily activities, most usually associated with skin scales. A review on investigation in hospitals, by Tammelin, Domicel, Hambraeus and Ståhle (2000) show that clothing act as a barrier to dispersal, from which it must be concluded that these organisms are retained on the inner surfaces of underclothing. The transmission of such contamination to other items of clothing and household linen will occur through other indirect contacts like through hands, sharing of used garments and also during laundry.

### Secondary sources

Apart from primary sources wherein the garment gets infected from person's own body flora, the garments and household linens may also get contaminated with pathogens from other infected sources in the environment. These secondary sources are further classified into two categories:

a) Spread of micro-organisms from infected sources

b) Spread of micro-organisms during laundry

*A. Micro-organisms from infected sources*

Ubiquitous micro-organisms represent the second important source of microbial contamination of textiles. The potential for spread of pathogens to clothing and so on, from infected sources (air borne microbes, mould spores in dust, infected people, contaminated food, domestic animals) in relatively high numbers is shown by data as reviewed in the 2011 IFH report (Bloomfield et al., 2011). Whereas organisms shed via skin scales or via faeces will mainly contaminate underclothing in contact with the skin, contamination from for example nasal secretions or from contaminated food or from nursing care of infected family members or physical interaction with household pets or contact with dust or earth is more likely on outer clothing. Common bacteria found in high numbers on a dish cloth,

kitchen towel and counter towel are *E. coli* and *P. aeruginosa*. In homes where there is an MRSA carrier, MRSA was isolated from laundered items (Bloomfield et al., 2011). Scott, Bloomfield and Barlow (1982), in their study of 200 UK homes, evaluated contamination from bathroom towels. The frequency of isolation for various organisms was 3.6%, for *S. aureus*, 2.6% for *E. coli* and 0.5% for *P. aeruginosa*. The proportion of towels which showed total counts of >100 cfu per RODAC contact plate was 27% (cfu in microbiology is a colony-forming unit used to estimate the number of viable bacteria or fungal cells in a sample. Viable is defined as the ability to multiply via binary fission under the controlled conditions). Ojima et al. (2002) evaluated contamination from kitchen hand and counter towels, and bathroom and toilet handtowels. The frequency of isolation was for coliforms 0 to 8%, *E. coli* 0 to 2.5%, and *P. aeruginosa* 0 to 6.2% for counter towels and *S. aureus* 2.6 to 7.4%. Counts were mostly between 1 and 9 cfu/10 $cm^2$, but counts of 10 to 1000 were sometimes recorded. An investigation of various articles was carried out by Tabata, Zhang, Maeda, Nagamune and Kourai (2003). *Staphylococcus spp.* were isolated from every sample of children's underwear, bath towels and kitchen rags (mean levels $10^3$ to $10^4$ cfu/$cm^2$), and also from the washing machine and leftover bath water. Coliform bacteria were found in 21 out of 27 samples, and *E. coli* was found in 3 of 27 samples of underwear and dish rags. *Staphylococcus spp.* and coliforms were also isolated from washing machines and bathwater, and *E. coli* was also isolated from bathwater. Robinton and Mood (1968) examined the contamination of cotton towels in washroom facilities, in gasoline stations, restaurants, airports, bus and rail stations, and similar establishments. Towels were sampled by pressing them onto RODAC agar plates. It was found that 70% of samples were contaminated with 1 or more cfu, 15% had >100 cfu per RODAC contact plate, and 7% of the samples had more than 300 cfu per plate. Samples yielded *S. epidermidis* (23% of samples), *Corynebacteria* (19%) and *Micrococci* (13%). *S. aureus* was isolated on two samples from cloth towels. No coliforms or other Gram-negative species were found.

*B. During laundry*

Apart from contamination through infected source, another and possibly more important source of contamination is laundry care of textiles. The process of the laundering has two main functions: first: to improve or restore appearance and prevent deterioration. Second, to reduce the numbers of microbes present, together with any substances that support their growth or interferes with disinfection (Dancer, 2004). It is generally assumed that garments and textiles after laundry are clean and therefore safe. However, it is important to understand that laundry may certainly have had the dirt removed, but it is far from sterile. There are two points where laundry can act as a disseminator of infection, firstly when it is handled before laundering, and secondly, if the laundry process fails to fully remove microbial contamination and the laundry remains damp for a period before being handled. There have been numerous studies that explain the transfer of infection during laundry. In 1966, a significantly high prevalence of *S. aureus* skin infection was found among families in Boston (Kundsin, 1966). The in-depth study revealed the cross-contamination of household laundry in families who used a community laundry compared with families who used their own washing machine. Community washing machines were found to be operating at a temperature of 50—65°C, which was considered inadequate for disinfection of laundry (Kundsin, 1966). Gerba and Kennedy (2007) examined the virucidal capacity of a typical home-laundering process (wash cycle with detergent alone, rinse cycle and a 28-minute permanent press drying cycle) and found that significant concentrations of the tested viruses (*Adenovirus*, *Rotavirus*, and *Hepatitis A virus*) survived the process. They further demonstrated that these viruses could be transferred from the contaminated garments to uncontaminated garments. Perry, Marshall and Jones (2001) documented the presence of Vancomycin-resistant *Enterococcus* (VRE), MRSA, and *Clostridium difficile* on home-laundered uniforms prior to the commencement of duty, suggesting the inadequacy of the home-laundering process in eradicating these organisms. Another main reservoir of infection is the washing machine itself where in the course of use, micro-organisms can accumulate in the water-conveying areas and can then be transmitted to clothing and textiles during the washing process. Insights into the ability of microbes present in washing machine water, to attach to fabrics during laundering comes from a study by Egert et al., 2010. Investigations of domestic washing machines have shown that microbial bio-films can be formed at various sites, such as the rinsing chamber, seals or washing solution drain (Egert et al., 2010). Because home machines use water at temperatures of 25—60°C, the water is less effective at killing microbes. Washing machines are contaminated after use and can spread bacteria, such as *Staphylococcus aureus* (a common cause of skin infections), from previous loads to future loads of laundry. Egert et al. in 2010 found bacteria in virtually all bio-film samples and fungi in around 60% of cases. The latter consisted of both filamentous fungi (moulds) and yeasts. The main

bacterial isolates were alpha-proteo-bacteria, a subgroup of Gram-negative bacteria, suggesting that the cleaning water used was the main source of the bacteria found in the machine. While no reliable data are available to elucidate to what extent textiles harbour microbial contamination from the washing machine, however, when assessing the antimicrobial performance of a washing process it must be borne in mind that microbes gain access to textiles not only through direct contact but also within the washing machine.

Although most of the existing data on the efficacy of laundering processes comes mainly from studies of machine laundry cycles. In most households in developing countries, washing machines are not generally used. In many cases, clothing and linens are washed and cleaned with detergents using water of dubious microbial quality. Even in houses of higher economic status, housemaids are assigned the task of washing household garments manually using detergents and water. Commercial laundries also often assign the task of bulk washing and cleaning to washer men who wash them in grossly polluted pond water, thus making laundry a major source of spread of infection in a household setting.

## Hygiene aspects of current domestic laundry practices

During laundering, temperature, together with the action of water and detergent work together to reduce soil and microbial contamination levels on fabrics. Washing of garments and textiles for removal of soil, stains, odour and pathogens has three main aspects (Terpstra, 1998).

### Physical removal

First, physical removal of soil and micro-organisms. Micro-organisms, affixed to soil or fibres of fabric, are dislodged by mechanical action when the dirt is removed; the micro-organisms are removed with it. This means that poor soil removal has a poor hygienic quality (Terpstra, 1998).

### Thermal inactivation

Thermal disinfection is the second aspect of disinfection by the washing process. When micro-organisms become suspended in socks, they become sensitive to heat and are easily killed—thermal disinfection. In general, a higher temperature speeds up thermal disinfection. A temperature of 85˚C for 6 min in an industrial laundering process has been shown to be sufficient to kill almost all bacteria, viruses and yeasts. At lower temperatures, the rate of elimination is less, and below 60˚C elimination is insufficient, and other disinfection methods will be needed (Terpstra, 1998).

### Chemical inactivation

The third mechanism of disinfection is chemical disinfection. During laundering, some chemical inactivation of microbes by the surfactants and activated oxygen-based bleach used in detergents contributes to the hygiene effectiveness of laundering. Adding hypochlorite bleach in the washing process also achieves inactivation of microbes (Bloomfield, Exner, Signorelli, & Scott, 2013). A number of other components can also contribute including:

- Where laundry is dried, added microbicidal effect can be achieved particularly from exposure to sunlight.
- Drying in a tumble drier can further reduce microbial load.
- Where clothes and linens are ironed, particularly where they are ironed damp, heat and steam penetrating the fabric causes reductions of microbial load.
- Microbial contamination is further reduced if clothes are stored dry.

Changes that have taken place in laundry practice in last two decades in developed countries need to re-evaluate the hygiene of laundering processes. Household laundry processes have changed a great deal in recent times following the development of synthetic textiles and due to the idea of sustainability. In an attempt to reduce the environmental impact of the household, laundering processes are continuously evolving and have resulted in procedural changes that include a general trend toward lower wash temperatures, the utilisation of less water, and the reduction in the use of bleach containing detergents(Scott, 1999). The number of these measures and changes has not only reduced the environmental impact but has also had a substantial influence on the hygiene quality in households (Terpstra, 2001). The aforementioned developments are believed to make the destruction

of harmful microbes during the washing process less efficient. It is further expected that the presence of a broad range of pathogenic microbes will also lead to a higher risk to human health.

Eighty-five to 90% of the energy used by a washing machine goes to heating water (Bluejay, 2007). Where previously laundering was carried out using water temperatures of 60ºC or above, in recent years there has been a trend towards reducing laundering temperatures (Gerba, 2001). Besides rising energy costs, consumers have switched to cold water wash cycles because it extends the life and minimises shrinkage of fabrics. Only five percent of households currently use hot water wash cycles (Gerba, 2001). Currently, the majority of domestic laundering is done at 40°C which is followed by tumble drying or ironing and does not use many of the chemicals routinely added to industrial machines (Patel, Murray-Leonard, & Wilson, 2006). Fewer bacteria are killed at the lower wash water temperatures used today. At washing temperatures below 60°C, soil removal becomes more difficult and the effectiveness of bleach systems decrease, so not only are clothes less clean, they are also less hygienic. Regularly washing at or below 40ºC without the use of a bleach product and smaller volumes of water may result in higher concentrations of micro-organisms in wash waters. The Department of Energy (DOE), star target values also include reductions in water usage per cycle for all newly constructed washing machines. Lower water use in new washing machines is being achieved through design modifications that reduce the initial water fill level and eliminate one or two rinse cycles per wash load. Subsequently, rinsing efficiency has decreased, resulting in greater amounts of soil and micro-organisms left behind in washed laundry (Terpstra, 1998).

Besides contaminating other laundry in a wash load, these micro-organisms in the wash leave the washing machine contaminated; spores which are left in the washing machine can proliferate and can cause bio-film formation and malodour formation. (Sajitz & Grohmann, 2011). Microbes can survive and multiply in damp clothes that have been washed in detergent and stored at room temperature (Scott & Bloomfield, 1990). For example in a recent study, after three weeks of use, a stale odour was produced in washing machines run with detergent but no bleach. Malodour is indicative of bacterial build-up. After 6 to 8 weeks, machines, where activated bleach product was not used, were deemed to have an unacceptably high level of malodour (Sheane, 2000). A formulation containing an activated bleach system showed significant benefits in eliminating the build-up of slime in the washing machine. The use of an activated bleach system of tetra acetyl ethylene diamine (TAED) totally prevented malodour formation in the machine (Beumer et al., 2008).

Steps to minimise the environmental impacts associated with the laundering process have also influenced detergent composition and availability. Household detergent alkalinity has been lowered by 1 to 2 pH units making them less effective as disinfectants in the wash process, particularly when no bleach products are used (Terpstra, 1998). In addition, low phosphate, biodegradable detergents containing less effective builders are mandated to comply with environmental regulations, and concentrated soap products have been introduced to not only lessen the amount of product in effluent, but also reduce the amount of product packaging needed. Similarly, by 1993 at least 35 states had issued guidebooks recommending the use of alternative products to sodium hypochlorite bleach additives (Parnes, 1997), citing among other reasons, its potential to produce an adverse environmental impact. The current generation of fabrics has new fibres, construction, quality of dyes, and special finishes that cannot withstand traditional bleach, and therefore laundering of these items requires the use of non-chlorine products (Belkin, 1998). The germicidal effectiveness of these non-chlorine type bleach substitutes has not been well documented. The changing composition of fabrics ultimately may impact the retention and release of viable micro-organisms (Sattar, Tetro, & Springthorpe, 1999).

New types of fabrics and dyes also have affected both the type of laundry products used and wash cycle temperatures. New fabrics have significantly reduced the amount of time consumers spend doing laundry. Drying after washing and rinsing provides the greatest reduction in bacteria and viruses (Scott & Bloomfield, 1990; Gerba, 2001). However, with the introduction of wrinkle-resistant fabrics, people rarely hang their clothes and linens outside, where the sunlight can aid in denaturing many microbes. Ironing, which causes steam to penetrate and reduce the microbial load in the fabric, has become less common (Kagan, Aiello, & Larson, 2002). Therefore, germs, fungi and viruses can survive the laundry process and can stay on the fabric or be transferred to other clothes during the laundry process.

## Is sustainability important or hygiene?

Whilst sustainability issues in laundering are important, equally it is important to consider hygiene issues especially for higher risk categories. The review of the literature indicates that not every household is susceptible to spread of infection. The spread of infection in a household setting is more in case if there is a person with illness in the family or any member of the family is associated with healthcare facilities or works on the farm, restaurant and so on or if there are infants or pets in the home. Data on the hygiene effectiveness of laundering by Bloomfield et al. (2013) in a 2013 IFH review is based on the principle that, if we are to minimise energy consumption associated with household laundering whilst at the same time managing infection risks, the items that make up the weekly wash need to be segregated into categories, with relatively more stringent laundering requirements specified for higher risk categories. Table 1 categorises laundry items according to the level of risk as recommended in the data given in the IFH review 2013 (Bloomfield et al., 2013).

**Table 1** **Categorisation of laundry items according to level of risk**

| Category | Sub-Category | | Items covered |
|---|---|---|---|
| **Category A** Higher Risk Items | **A1** | Specific items of clothing, household linens, etc. where there is considered to be a higher risk that they may have become contaminated with pathogens or antibiotic resistant strains during normal daily use or wear. | • Clothing of workers who are likely to come into contact with pathogens, which are laundered at home e.g. healthcare, restaurant, laboratory and sewage workers, veterinarians, farmers, etc.<br>• Clothing of family members giving care to infected family members.<br>• Clothing etc. which is heavily soiled e.g. with faeces or vomit, or body fluids (including reusable baby nappies).<br>• Sports clothing, particularly high-contact sports such as rugby football, martial arts, etc.<br>• Cloths, towels, etc. used in the kitchen during food preparation, in the nursery and in the toilet area.<br>• Clothing of hospital patient that is taken home by the family for laundering.<br>• Clothing of family members with skin diseases such as dermatitis, who may be heavy shedders, e.g. *S. aureus*<br>• Fabric items associated with domestic pets e.g. pet blankets. |
| | **A2** | All items of clothing, household linens, etc. used or worn in situations where there is a higher infection risk. | • Someone in the home is infected, e.g. shedding bacterial pathogens in faeces, or fungal pathogens, such as in athletes foot, from their skin, or Candida from mucous membranes.<br>• There is someone in the home who is particularly vulnerable to infection e.g. undergoing cancer chemotherapy, HIV/AIDS, etc. |
| **Category B** Lower Risk Items | **B1** | Those items of normal daily wear which come into direct, significant and persistent contact with body surfaces during normal daily wear. | • Underclothing (including socks, vests, bras, pants), sweat shirts, towels, bed linens, face cloths and other personal items. |
| | **B2** | Those items of normal daily wear outer clothing which does not have extensive and persistent contact with body surfaces. | • Jackets, sweaters, skirts, trousers, soft furnishings, table linens, etc. |

*Note.* Own representation of the data retrieved from Bloomfield et al., 2013

## Guidance on laundering of clothing and household linen to ensure hygiene

It is really important to launder effectively to destroy all the germs and then dry your laundry promptly. Items that may be contaminated with pathogens for example underwear, personal towels, nappies, socks and so on should be handled and washed or laundered separately and using a process which eliminates the risk of spread of infection in the home.

This means

- Wet items should not be kept in the laundry basket.
- Laundry should be sorted so as not to mix "germs": potentially soiled articles (towels, linens, and underclothing) with low-risk clothing (shirts, trousers). Also, tea towels and dishcloths should not be mixed with other items.
- Disposable gloves should always be worn when handling laundry if it is visibly soiled.
- Residual solid material should be removed with a tissue and placed in the toilet before laundering or washing.
- Sluicing (hand-washing dirty linen before putting it in the washing machine) is not recommended as this can create aerosols that may contain pathogens.
- Where there is more risk, it is important to launder all items at high temperatures and using a chemical disinfectant as a mean to assure hygiene of the laundered items. Two processes, that is, washing at 60°C or above or washing at 30—40°C using a bleach-based product are considered suitable for hygienic cleaning of clothing and linen. However, it is recommended to check manufacturers' washing instructions on all items for temperature suitability and usage of bleach. One should ensure that a bleach-based product will not damage item.

### Washing at 60°C or above

The IFH 2013 review data (Bloomfield et al., 2013) recommends that A1 and A2 type items should always be machine laundered at 60°C or above. This is considered to give consistent hygienic decontamination, removing bacteria, fungi and viruses by a combination of physical removal and heat inactivation. However, if the fabric is heavily soiled, or one does not prefer to wash at a high temperature, a suitable laundry disinfectant should be added to reduce the risk of growth of micro-organisms. In a review of 11 reports published since 1938, Battles and Vesley (1981) concluded that most vegetative organisms are killed by laundering at 60˚C and 66˚C is effective for more resistant species such as *Streptococcus*.

Wiksell, Pickett and Hartmen (1973) demonstrated that, although large numbers of bacterial spores and other micro-organisms were recoverable from wash and rinse water indicating physical removal from clothes during the wash, *Serratia marcescens* was not recovered from fabric or wash water when temperatures of 57ºC or 68ºC were used. A wash temperature of 57ºC resulted in >90% reduction in *E. coli* T3 bacteriophage counts compared with lower wash temperatures.

### Washing at 30—40°C using a bleach-based product

There are a number of studies which show that the addition of bleaching agents is the most important bactericidal step for low-temperature washing procedures. Blaser, Smith, Cody, Wang and La Force (1984) examined soiled sheets and terry cloth items from a hospital laundry. At a low temperature (22.5ºC) washing cycle without laundry chemicals, the number of bacteria isolated from the rinse water indicated that agitation, dilution and drainage achieved a 3-log10 reduction of bacteria from the laundry. When low-temperature laundry chemicals were used, the number of organisms detected in the rinse water was lower than in the wash without chemicals. Smith, Davidson and Davidson (1987) showed that a low-temperature wash (average 31ºC) and bleach (100—120ppm) reduced bacterial counts in fabric by 3 log10 (99.9%). Ainsworth and Fletcher (1993) showed that for both a laundry powder with activated bleach and liquid detergent alone, disinfectant action against *Enterococcus faecalis* was substantially better at 50ºC than at 30ºC. Both detergents improved the antimicrobial action of the wash compared to hot water (50ºC) alone. Use of a bleach system also led to less odour on garments immediately after washing and after storage of damp laundry for 24 and 48 hours (Sheane, 2000).

The IFH 2013 review data recommends that B1 and B2 type items should be machine laundered at 30—40°C, using an activated oxygen bleach-based laundry product (Bloomfield et al., 2013). This

produces decontamination of fabrics by a combination of physical removal and chemical inactivation. However, some types of fungi and viruses that are harder to inactivate, may not be removed. Evidence suggests that laundering of items at 30—40°C may be insufficient to prevent transmission of any pathogens between different items within the same wash load. It is thus advised that Category B1 and B2 items are segregated into separate loads and laundered separately.

The hygienic effectiveness of laundering under each condition depends on ensuring that:

- The machine is not overloaded, that is, is loaded according to instructions.
- The correct dosage of detergent is added according to pack instructions.
- The machine, load and wash water is heated to, and reaches 30 or 40°C, prior to the commencement of the cycle. A standard wash cycle is used (i.e. avoid a *quick wash*, *water saving* or other *eco* cycles).
- The load is subjected to at least two; preferably three rinse and spin cycles.

Hygienic quality assurance of all these items can further be increased by:

- Drying in sunlight
- Tumble drying at 40°C or more, for 20 minutes or more.
- Ironing—particularly steam ironing.

## Guidance to ensure hygiene for all types of laundry

- Hands should be washed immediately after handling soiled laundry.
- Dirty laundry should be kept away from food preparation surfaces.
- Laundry should be dried as soon as possible after washing. Many germs such as *Salmonella*, *Hepatitis A virus*, and *Rotavirus* can even survive drying, so it is important that care is taken when drying clothes. Clothes should not be left damp for long periods, for example in the washing machine overnight, because any remaining germs may multiply rapidly.
- As wet laundry can be a potential breeding ground for mould, clothes should be dried outside in the sun or in an 'outdoor vented' clothes dryer in order to prevent any increase in humidity in the home and prevent mould growth if possible.
- At least once a week, a high-temperature wash or chemical disinfectant on an empty cycle should be used to prevent the build-up of germs (i.e. harmful organisms and other microbes in the machine) and odours building up in the machine.
- The washing machine should be kept clean and dry—including rubber lining which should preferably be cleaned with a weak bleach solution (1 cup of household bleach to 2 pints water).
- The detergent box should be rinsed and scrubbed weekly—if required, use boiling water.
- The door of the washing machine and the detergent box should be kept open when the washing machine is not in use to enable inner surfaces of the washing machine to dry.
- If using communal laundry facilities, for example, a launderette, bleach-based product should always be used.

## Consensus statement on hygiene practices in domestic laundry

Laundry hygiene is an important aspect of household cleaning. In earlier times, clothes were washed at high temperatures, often boiling to ensure the hygiene of the garments. However, with rapid advancements in technology, changing socio-cultural norms, improved standards of living and increased environmental impacts due to domestic laundry practices, laundry habits in households are constantly changing. These changes (e.g. lower wash temperature, less water consumption) have not only reduced the environmental impact but have also reduced hygiene levels in clothes cleaning. Developments in relation to the environment are although lowering the hygienic quality of clothes cleaning. However, it has been shown that not everybody needs perfect hygiene and only a part of the population is susceptible, and only in those situations are high levels of hygiene is needed. Therefore, the guidance given in this document is based on the principle that, if we are to minimise energy consumption associated with household laundering whilst at the same time managing infection risks, the items that make up the weekly wash need to be segregated into categories, with relatively more stringent laundering requirements specified for higher risk categories.

It is recommended that all soiled clothing and household linens (B1 and B2 Type) which routinely carry a lower risk of contamination with faecal, skin-borne or other pathogens should be laundered at 30—40°C using an activated bleach powder. Whereas, where clothing is heavily soiled or carries a higher risk of contamination with pathogens, or where people who are particularly vulnerable to infection are present, it is recommended that all clothing and linens (A1 and A2 type) should be laundered at 60°C or above using an activated bleach powder. Laundry must be dried immediately after washing is completed. It is also important to ensure that laundry is not carried out using polluted water, particularly where it is carried out outside the home in rivers and nearby streams like in some developing countries.

## Disclosure statement

No potential conflict of interest was reported by the author.

## Biographies

Nidhi Gupta is a PhD student at Department of Home science, University of Delhi. She has an MSc in textile and clothing from Lady Irwin College, University of Delhi. She has researched on areas related to clothing and size issues and is currently working with sustainability of laundry practices, concentrating on the development of green ways of doing laundry at domestic level.

Seema Sekhri (PhD), is an Associate Professor, Department of Fabric and Apparel Science, Lady Irwin College, University of Delhi. With 20 years of teaching experience she has recently completed a UGC sponsored major research project on 'Application of Natural Dyes in Home Textiles'. A life member of Home Science Association of India, Textile Association of India and Fibre Forum of India. She has a number of papers in reputed research journals to her credit. She has also authored a book *Textbook of Fabric Science—Fundamentals to Finishing*, in the year 2011.

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# Creating a new texture by controlling the bubble content in konjac

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## Abstract

*Controlling the amount of bubbles was considered effective in developing a new texture of konjac products. In this study, the bubble content in konjac aqueous dispersions was investigated by changing preparation methods, adding foam stabilisers (gum arabic, methylcellulose, pullulan, and soluble soybean polysaccharide), and changing the concentrations of konjac and foam stabilisers. The concentration of konjac flour and foam stabilisers was varied from 0.5 to 5.0 wt% and 0 to 3.0 wt%, respectively. The specific gravity of konjac aqueous dispersions was measured, and the bubble content was calculated. It was found that the specific gravity of 1.0 wt% konjac aqueous dispersions was not influenced by changing stirring time when samples were prepared, indicating that the amount of bubbles for the samples was not changed. However, increasing the concentration of konjac flour increased the bubble content of the samples, that is, konjac flour itself had the ability to produce foams. Moreover, adding foam stabilisers to konjac aqueous dispersions also increased the bubble content of the samples. Among the four kinds of foam stabilisers, methylcellulose was the most effective in increasing the bubble content. It was found that adding 0.2–0.5 wt% methylcellulose increased the bubble content of 1.0–3.0 wt% konjac samples most effectively. The lower concentration of konjac was more effective in increasing bubble contents. It was concluded that adding methylcellulose was the most effective to make a new texture of konjac products.*

**KEYWORDS: KONJAC, TEXTURE, GEL-LIKE FOOD, JAPAN**

## Introduction

In Japan, there are many traditional gel–like foods, such as tofu, *kamaboko* (fish cake), agar jelly, *yokan* (sweet red bean jelly), and rice cake. Konjac is one of the traditional gel–like Japanese foods. It is said that konjac was introduced in Japan as medicine in the 6th century (Nussinovich & Hirashima, 2013a). After Toemon Nakajima developed a manufacturing technique for konjac flour in 1776, konjac was spread to the whole country as food (Nussinovich & Hirashima, 2013a; Tanaka, 1999). Since then many Japanese people have come to eat konjac, and have enjoyed its characteristic texture for a long time. Therefore, there are many forms of konjac products with various texture of

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konjac, for example, *ita*–konjac (board type), *ito*–konjac (string type), *tama*–konjac (ball type), and *sashimi*–konjac (slice type). There are also many kinds of dishes that use many types of konjac, such as simmered, stir–fried, and salad dishes. Creating a new texture of konjac is important for the variety of ways konjac is consumed by the Japanese. Moreover, konjac has recently been receiving attention in the USA and in Europe because it is low in calorie and healthy. Thus various kinds of konjac would be introduced to the world.

Konjac gels are usually made by dispersing konjac flour into water and stirring vigorously, then letting the dispersion stand for a few hours until konjac is swollen. Then the alkaline dispersion, such as calcium hydroxide or sodium carbonate, is added to the swollen konjac dispersion, then boil. Konjac forms a thermally stable gel upon heating in the presence of an alkaline coagulant. Konjac glucomannan (KGM) in konjac flour is a main component for a gelation of konjac. KGM is a neutral polysaccharide derived from the tuber of *Amorphophallus konjac* C. *Koch*. It is composed of ß–1,4 linked D–mannose and D–glucose; the ratio of mannose and glucose is 1.6:1 (Kato & Matsuda, 1969). There are some branching points at the C–3 position of the mannoses (Maeda, Shimahara, & Sugiyama, 1980). An acetyl group is attached to one per 19 sugar residues (Maekaji, 1978a, b). The viscosity of KGM aqueous dispersions is higher than those of other polysaccharides dispersions, such as carrageenan, guar gum, locust bean gum, methylcellulose, xanthan gum, and gum arabic (Yaseen, Herald, Aramouni, & Alavi, 2005).

When the konjac flour aqueous dispersions are stirred vigorously, many bubbles are formed in the dispersions. These bubbles are thought to influence the tastes of konjac products with seasonings and the texture of konjac. However, there is little research on controlling the bubble content in konjac products and on proving the relationship between the texture of konjac gels and the bubble content. In this study, the bubble content in konjac aqueous dispersions was investigated by changing the concentrations of konjac flour and the preparation methods, and by adding foam stabilisers, such as gum arabic, methylcellulose (MC), pullulan, and soluble soybean polysaccharides (SSPS). These stabilisers are polysaccharides, but the viscosity of their aqueous solutions is very low compared with that of the konjac aqueous dispersion. Gum arabic is made by exuding from trees *Acacia senegal* and used as a thickening and a stabilising agent in foods, such as chocolate and cream. MC is one of the derivative cellulose, and forms a thermally stable gel upon heating above 50–75 °C, and became solid upon cooling. An increase in the use of MC in foods is expected (Shin–Etsu Chemical Co., Ltd., 1996). Pullulan is produced via fermentation by *Aureobasidium pullulans* and used in pharmaceuticals and food (Matsuda, 1994). SSPS is a water–soluble polysaccharide extracted from soybean and used as a thickening and a stabilising agent in fermented milk beverages and noodles (Nussinovich & Hirashima, 2013b).

There are many reports on the gelation properties of KGM aqueous dispersions with many kinds of polysaccharides, for example, carrageenan (Yaseen, Herald, Aramouni, & Alavi, 1993), gellan gum (Miyoshi, Takaya, & Nishinari, 1996), guar gum, locust bean gum, pullulan, sodium alginate (Ota & Maekaji, 2000), starch (Yoshimura, Takaya, & Nishinari, 1998), and xanthan gum (Williams, Day, Langdon, Phillips, & Nishinari, 1991). However, in their research, the gelation mechanism of KGM was just investigated, so there were few reports regarding texture control. In this study, the changes of texture for KGM aqueous dispersions were examined to create a new texture of konjac products.

## Materials and methods

### Materials

Konjac flour (Maruyama Shoten, Co., Ltd., Yamanashi, Japan) was kindly provided by Uenoya Corporation (Mie, Japan). Konjac flour concentration ($C_k$) was varied from 0.5 to 5.0 wt%. Moisture and konjac glucomannan contents of the konjac flour sample were 8.6% and 86.4%, respectively. Gum arabic was reagent grade (Wako Pure Chemical Industries, Ltd., Osaka, Japan). Methylcellulose (MC) (MCE–4000), pullulan (1K1612), and soluble soybean polysaccharide (SSPS) (SOYAFIBE–S–DN) samples were provided by Shin–Etsu Chemical Co. Ltd., (Tokyo, Japan), Hayashibara Co. Ltd., (Okayama, Japan), and Fuji Oil Co. Ltd., (Osaka, Japan), respectively. The concentration of these foam stabilisers was varied from 0 to 3.0 wt%.

*Preparation of konjac aqueous dispersion*

The preparation method of konjac aqueous dispersions is shown in Figure 1. An arbitrary concentration of konjac flour was added to distilled water at 25 °C, and the dispersion was stirred with a hand mixer at about 950 rpm for 2 to 60 min (from A to B), which was defined as the time of the first stirring ($t_{s1}$). Next, the dispersion was submerged in a water bath at 25°C and stirred for 30 to 88 min using a magnetic stirrer at 200 rpm until the konjac flour swelled completely (from B to C). The time of the second stirring ($t_{s2}$) depended on $t_{s1}$. Samples were stirred for 90 min from A to C ($t_{s1}$ + $t_{s2}$). Then the dispersion was stirred with a hand mixer again for 0 to 60 min (from C), which was defined as the time of the third stirring ($t_{s3}$). $t_{s1}$, $t_{s2}$ and $t_{s3}$ of the konjac aqueous dispersions were basically fixed at 10 min, 80 min and 0 min, respectively. When foam stabilisers were added to the konjac aqueous dispersions, they were added to the dispersion before the swelling of the konjac flour (point A). $t_{s1}$, $t_{s2}$ and $t_{s3}$ of the konjac aqueous dispersions with foam stabilisers were basically fixed at 10 min, 80 min and 10 min, respectively.

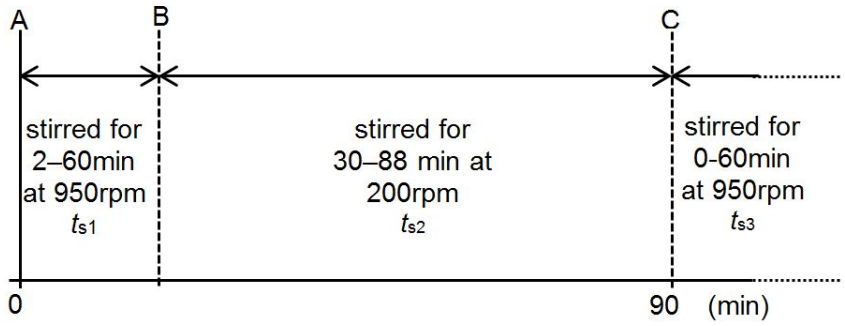


**Figure 1 Preparation method of konjac aqueous dispersions**

*Preparation of foam stabiliser aqueous solutions*

Gum arabic, pullulan or SSPS was dispersed in distilled water at 25°C and was stirred with a glass rod until it dissolved. MC was dispersed in distilled water and was heated in a water bath at 40 °C by stirring with a magnetic stirrer at 200 rpm until it dissolved.

*Specific gravity measurements*

The specific gravity of konjac aqueous dispersions with or without foam stabilisers ($d_s$) was measured by using a Fisher Pycnometer Cat. No. 03–247 (Thermo Fisher Scientific K.K., Tokyo, Japan) at 25.0 °C. The weight of water was used as a reference.

The specific gravity of powder samples ($d_p$), that is, the specific gravity of konjac flour, gum arabic, MC, pullulan or SSPS, was measured by using a Gay–Lussac type pycnometer (As One Corporation, Osaka, Japan) at 25.0 °C. The weight of toluene was used as a reference.

From these values of $d_p$ and the specific gravity of water, the specific gravity was calculated assuming that the sample had no bubbles ($d_c$). Then the apparent bubble contents ($\Phi$) of the samples were calculated from the values of $d_s$ and $d_c$ (Equation 1), and the change of the bubble contents in the konjac dispersions was examined.

$$\phi = \left(1 - \frac{d_s}{d_c}\right) \times 100$$

**Equation 1**

where $\Phi$ is the apparent bubble content, $d_s$ is the specific gravity of the sample and $d_c$ is the calculated specific gravity assuming that the sample had no bubbles.

*Steady shear viscosity measurements*

The apparent shear viscosity ($\eta$) was measured by using a RV DV–II + Pro Viscometer (Brookfield Engineering Laboratories, Inc., Massachusetts, USA) with a small sample adapter attached. The temperature of the samples was controlled to be at 25.0 °C. The shear rate ($\gamma$˙) was varied between 0.009 and 186 s-1.

## Results and discussion

### Effects of concentration and preparation methods on the bubble content in konjac aqueous dispersions

Figure 2 shows the konjac flour concentration ($C_k$) dependence of the specific gravity ($d_s$) and the bubble content ($\Phi$) of the konjac aqueous dispersions. $d_s$ of the konjac aqueous dispersions decreased slightly with increasing $C_k$, and $\Phi$ of the samples calculated from $d_s$ and the specific gravity of konjac flour (Equation 1) increased with increasing $C_k$. It was found that konjac flour itself had the ability to produce foam in its dispersions though its effect was very small.

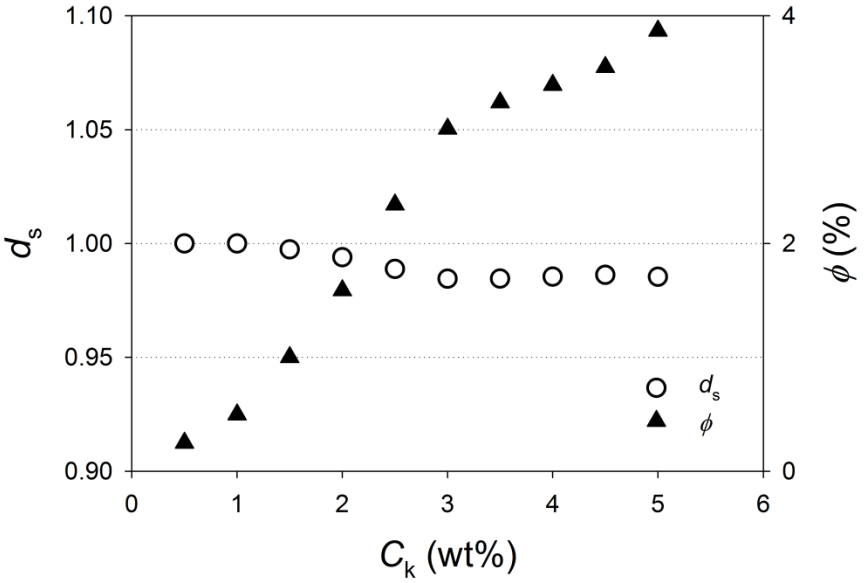


**Figure 2** **Konjac flour concentration $C_k$ dependence of specific gravity $d_s$ and apparent bubble content $\Phi$ for konjac aqueous dispersions. Measurements were made at 25.0 °C**

Figure 3 indicates the shear rate ($\gamma$) dependence for the apparent steady shear viscosity ($\eta$) of samples. All konjac aqueous dispersions with different $C_k$ exhibited the shear–thinning behaviour. It has been reported that many kinds of polysaccharide dispersions or solutions exhibit the shear–thinning behaviour (Haque & Morris, 1993; Tanaka, Fang, & Nishinari, 2006; Yu, Huang, Ying, & Xiao, 2007). Konjac aqueous dispersions were no exception. $\eta$ increased with increasing $C_k$.

From these results, it is thought that the bubbles in the konjac aqueous dispersions became stable with increasing $\eta$, and $\Phi$ of the samples increased with increasing $C_k$.

To examine the effects of stirring time on $\Phi$ for the konjac aqueous dispersions in detail, $C_k$ = 1.0 wt% was used. The time of the first stirring ($t_{s1}$) and the second stirring ($t_{s2}$) (see from A to C in Figure 1) did not influence $d_s$ and $\Phi$ for 1.0 wt% konjac aqueous dispersions (data not shown). The time of the third stirring ($t_{s3}$) (point C in Figure 1) also did not influence $d_s$ (open symbols in Figure 4). As mentioned above, $\Phi$ increased with increasing $C_k$, so 2.0 wt% konjac aqueous dispersions were prepared by the same method until 90 min (point C in Figure 1), which were expected to contain more bubbles than 1.0 wt% konjac aqueous dispersions, and then water was added after 90 min from the beginning of the preparation (point C in Figure 1), and was stirred with changing $t_{s3}$ (The final $C_k$ of the samples became 1.0 wt%). However, there were no differences between $d_s$ and $\Phi$ of the samples (compared with open and solid symbols in Figure 4) prepared by these different methods. It was found that $\Phi$ of 1.0 wt% konjac aqueous dispersions was not influenced by the preparation

methods and stirring times. $\eta$ of the samples also did not change at all when the preparation methods were changed (data not shown). It was found that the texture of the konjac aqueous dispersions did not change by changing the preparation methods and stirring time of 1.0 wt% konjac aqueous dispersions.

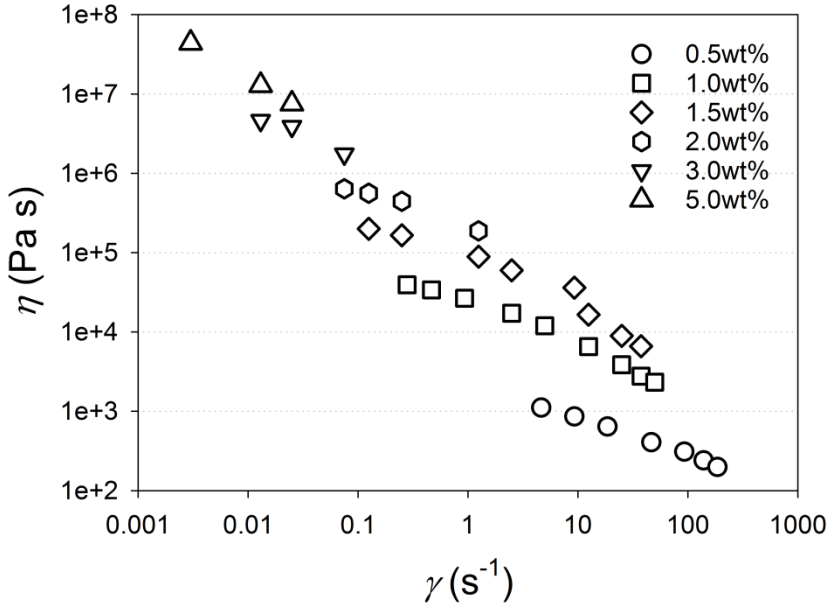


**Figure 3** **Shear rate dependence $\gamma$ of apparent shear viscosity $\eta$ for konjac aqueous dispersions with various konjac flour concentrations. Konjac flour concentrations were varied between 0.5 and 5.0 wt%. Measurements were made at 25.0 °C**

From these results, it is concluded that the bubble content of 1.0 wt% konjac aqueous dispersions could not be influenced by changing the preparation methods, especially stirring times. It seems that stirring for a longer time could form bubbles in the konjac aqueous dispersions, but bubbles disappeared from the samples at the same time. Then foam stabilisers were added to the konjac aqueous dispersions to prevent the samples from losing bubbles.

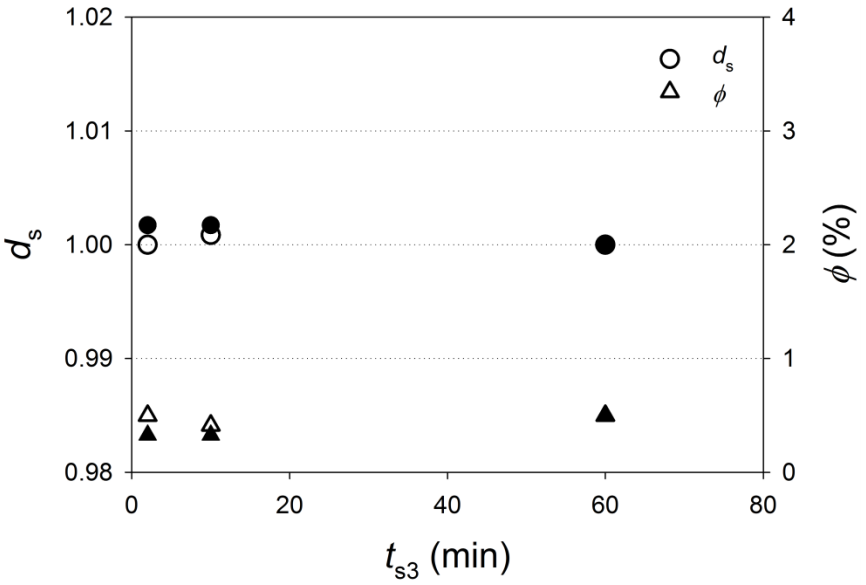


**Figure 4** **Third stirring time $t_{s3}$ dependence of specific gravity $d_s$ and apparent bubble content $\Phi$ of 1.0 wt% konjac aqueous dispersions. Samples were prepared at 1.0 wt% konjac aqueous dispersions in the beginning (open), and samples were prepared at 2.0 wt% konjac aqueous dispersions, were diluted with water and finally at 1.0 wt% konjac aqueous dispersions (solid). Measurements were made at 25.0 °C**

**Effects of adding foam stabilisers to konjac aqueous dispersions on the bubble content of konjac aqueous dispersions**

In 1.0 wt% konjac aqueous dispersions with methylcellulose (MC) and soluble soybean polysaccharide (SSPS) added, then some bubbles separated from the dispersions after 90 min from the beginning of the sample preparation (point C in Figure 1), and the dispersions became non-uniform. Therefore, the samples were prepared by stirring for 10 min after 90 min from the beginning of the sample preparation; that is, $t_{s3}$ = 10 min.

$d_s$ and $\Phi$ of 1.0 wt% konjac aqueous dispersions with 0.2 wt% of each foam stabiliser (gum arabic, MC, pullulan, and SSPS) added are shown in Table 1. The values of $d_s$ for all samples with foam stabilisers were lower than that for 1.0 wt% konjac aqueous dispersion (control), and $\Phi$ of all samples with foam stabilisers were higher than that for the control. It is considered that when the konjac aqueous dispersion contained more bubbles, $d_s$ decreases and $\Phi$ increases. Therefore, samples with foam stabilisers held many bubbles in the konjac aqueous dispersions compared with the control. These foam stabilisers could prevent the bubbles in the dispersions from disappearing. $\Phi$ for the samples with gum arabic, pullulan, and SSPS increased slightly, but $\Phi$ for the sample with MC was greatly increased. The values of $d_s$ for 0.2 wt% and 0.4 wt% foam stabiliser aqueous solutions were much smaller and almost the same (Table 2). However, MC showed the ability to produce many bubbles in the konjac aqueous dispersions compared with gum arabic, pullulan and SSPS. Moreover, $\eta$ of the MC aqueous solutions was higher than that of gum arabic, pullulan or SSPS aqueous solutions with the same concentration (data not shown). It is thought that higher viscosity of MC aqueous solutions were effective in increasing $\Phi$ in the konjac aqueous dispersions, and the addition of MC to the konjac aqueous dispersions was the most effective among foam stabilisers used in this study.

**Table 1** **Specific gravity $d_s$ and apparent bubble content $\Phi$ of 1.0 wt% konjac aqueous dispersion (control) and 1.0 wt% konjac aqueous dispersions with 0.2 wt% gum arabic (+ gum arabic), methylcellulose (+ MC), pullulan (+ pullulan), or soluble soybean polysaccharide (+ SSPS). Measurements were made at 25.0 °C**

| | control | + gum arabic | + MC | + pullulan | + SSPS |
|---|---|---|---|---|---|
| $d_s$ | 1.002 | 0.999 | 0.410 | 0.999 | 0.868 |
| $\Phi$ (%) | 0.32 | 0.62 | 59.24 | 0.80 | 13.61 |

**Table 2** **Specific gravity ds and apparent bubble content $\Phi$ of 0.2 wt% and 0.4 wt% of foam stabiliser aqueous solutions. Measurements were made at 25.0 °C**

| | gum arabic | MC | pullulan | SSPS |
|---|---|---|---|---|
| $d_s$ for 0.2 wt% | 0.999 | 0.999 | 0.998 | 0.999 |
| $\Phi$ for 0.2 wt% (%) | 0.123 | 0.203 | 0.400 | 0.108 |
| $d_s$ for 0.4 wt% | 0.999 | 0.998 | 0.997 | 0.999 |
| $\Phi$ for 0.4 wt% (%) | 0.156 | 0.427 | 0.699 | 0.127 |

Figure 5 shows $\eta$ of 1.0 wt% konjac aqueous dispersions with 0.2 wt% of each foam stabiliser as a function of $\gamma$. All samples showed shear–thinning behaviour. $\eta$ of 1.0 wt% konjac aqueous dispersion added 0.2 wt% pullulan was slightly lower than that of the control, but $\eta$ of 1.0 wt% konjac aqueous dispersion with 0.2wt% gum arabic was much lower than that of the control. In addition, $\eta$ of samples with MC and SSPS could not be measured using the viscometer used in this study because the values of $\eta$ were much too small. Although the total concentration of polysaccharides (konjac flour + foam stabiliser) in the konjac aqueous dispersions with foam stabilisers was higher than that of the control, $\eta$ of the samples with all foam stabilisers were lower than that of the control. It indicated that $d_s$ influenced $\eta$; that is, $\eta$ decreased with lowering $d_s$. Moreover, 1.0 wt% konjac aqueous dispersion with 0.2 wt% MC was not stable, meaning the bubbles floated upwards during the measurements. Therefore, the change in the state of the samples with MC by varying the stirring time was observed. The samples, which were stirred for 60 min after 90 min from the beginning of the sample preparation (from point C to the end in Figure 1), maintained a uniform state for 180 min after the stirring was finished. However, measurements could not be also taken by using the viscometer used in this study because of large amounts of bubbles and much too low viscosity.

MC forms gel upon heating and have a heat resistance property as mentioned above. And konjac gels are made basically by stirring konjac flour and water, adding an alkaline substance (coagulant) aqueous dispersions, and by heating it. Therefore, MC might have a possibility of acting as a coagulant for konjac gels without an alkaline coagulant. It could be expected to develop a new texture of konjac gels with many bubbles, and more detailed experiments were conducted.

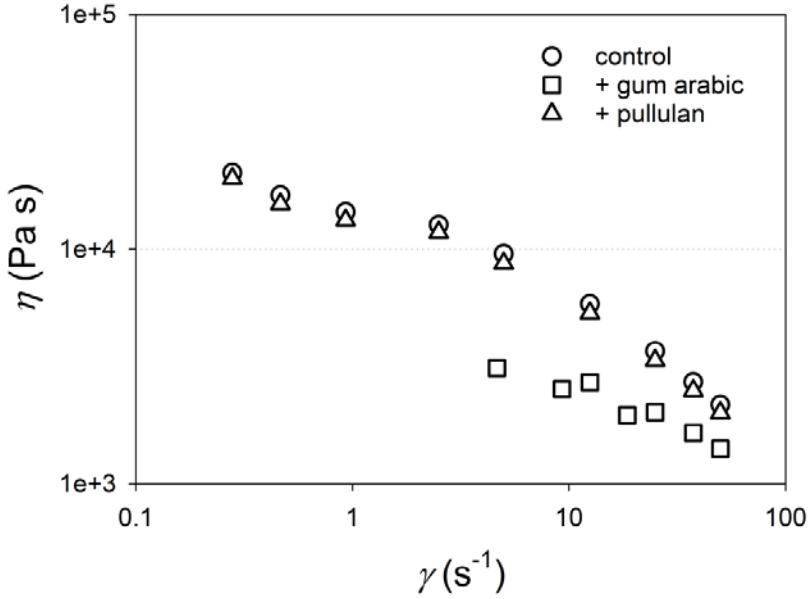


**Figure 5** **Shear rate $\gamma$ dependence of apparent shear viscosity $\eta$ for 1.0 wt% konjac aqueous dispersions (control), and 1.0 wt% konjac aqueous dispersion added 0.2 wt% gum arabic (+ gum arabic) or 0.2 wt% pullulan (+ pullulan). Measurements were made at 25.0 °C**

### Effects of the concentrations of konjac flour and methylcellulose on the bubble content of konjac aqueous dispersions

Figure 6 shows $d_s$ and $\Phi$ of the MC aqueous solutions as a function of the concentration of MC ($C_{MC}$). Both $d_s$ and $\Phi$ of the MC aqueous solutions were increased slightly with increasing $C_{MC}$. It means that MC had the ability to produce foam in its solutions through its ability was less than that of konjac flour (Figure 2).

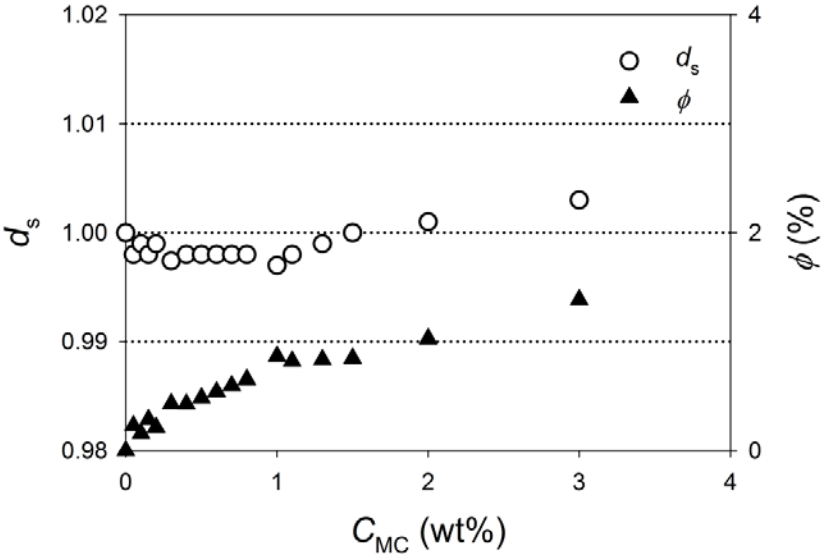


**Figure 6** **Methylcellulose (MC) concentration CMC dependence of specific gravity ds and apparent bubble content Φ of MC aqueous solutions. Measurements were made at 25.0 °C**

Figure 7 illustrates $C_{MC}$ dependence of $d_s$ and $\Phi$ for 1.0 wt% konjac aqueous dispersions with MC. Samples were prepared by stirring for 10 min at the beginning of the sample preparation and by stirring again for 10 min after 90 min from the beginning of the sample preparation ($t_{s1}$ and $t_{s3}$ in Figure 1, respectively). The values of $d_s$ for 1.0 wt% konjac aqueous dispersions with MC were far smaller than those of the konjac aqueous dispersions (Figure 2) or the MC aqueous solutions (Figure 6). $d_s$ and $\Phi$ for 1.0 wt% konjac aqueous dispersions with MC were greatly influenced by $C_{MC}$. $d_s$ for the samples decreased with increasing $C_{MC}$ at $C_{MC} \leq 0.2$ wt%, and increased with increasing CMC at 0.2 wt% < $C_{MC} \leq 0.8$ wt%. Then $d_s$ for the samples decreased again with increasing CMC at 0.8 wt% < $C_{MC} \leq 1.3$ wt%, and did not depend on $C_{MC}$ at $C_{MC} > 1.3$ wt%. ▫ for the samples had the opposite result from $d_s$. $\Phi$ increased with increasing $C_{MC}$ at $C_{MC} \leq 0.2$ wt%, decreased with increasing $C_{MC}$ at 0.2 wt% < CMC ≤ 0.8 wt%, increased again with increasing $C_{MC}$ at 0.8 wt% < $C_{MC} \leq 1.3$ wt%, and did not depend on $C_{MC}$ at $C_{MC} > 1.3$ wt%. The maximum value of $\Phi$ ($\Phi$ max) was 59.2% at $C_{MC} = 0.2$ wt% (see Table 2). It is thought that the ability of MC to produce foam increased with increasing $C_{MC}$ at $C_{MC} \leq 0.2$ wt%, therefore the konjac aqueous dispersions contained many bubbles. The viscosity of MC aqueous solutions at 0.2 wt% < $C_{MC} \leq 0.8$ wt% was higher than that at $C_{MC} \leq 0.2$ wt% (Yin, Nishinari, Zhang, & Funami, 2006), so it is thought that it would be harder to produce bubbles with the same stirring force and time. Though it became much harder to produce bubbles at 0.8 wt% < $C_{MC} \leq 1.3$ wt%, once the bubbles formed in the samples, they might not disappear from the samples because of the higher viscosity of the samples. Thus $\Phi$ increased. Moreover, bubbles forming and disappearing in the samples achieved equilibrium at $C_{MC} > 1.3$ wt%.

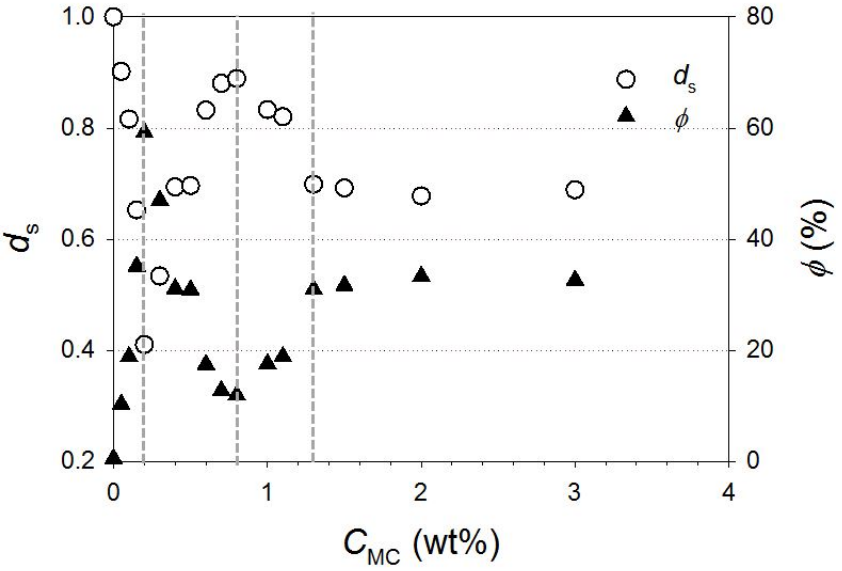


**Figure 7** **Methylcellulose (MC) concentration $C_{MC}$ dependence of specific gravity $d_s$ and apparent bubble content $\Phi$ of 1.0 wt% konjac aqueous dispersion added MC. Measurements were made at 25.0 °C**

Although both $\Phi$ of konjac aqueous dispersions and MC aqueous solutions was increased with increasing $C_k$ and $C_{MC}$ (Figure 2 and Figure 6), the changes of $\Phi$ for the mixture of konjac flour and MC was completely different. It was thought that the interaction between konjac glucomannan and MC occurred.

The tendency of $C_{MC}$ dependence of $d_s$ and $\Phi$ for 2.0 wt% and 3.0 wt% konjac aqueous dispersions with MC was almost the same as those of 1.0 wt% konjac aqueous dispersions with MC (Figure 8). However, the changes of $d_s$ and $\Phi$ for 2.0 wt% and 3.0 wt% samples by CMC were smaller than those for 1.0 wt% samples.

$\Phi$ for 2.0 wt% konjac aqueous dispersions increased with increasing $C_{MC}$ at $C_{MC} \leq 0.4$ wt%, and had the greatest value at CMC = 0.4 wt%. $\Phi$ for 2.0 wt% samples decreased with increasing $C_{MC}$ at 0.4 wt% < $C_{MC} \leq 2.0$ wt%, and did not depend on $C_{MC}$ at $C_{MC} > 2.0$ wt%. $\Phi$ for 3.0 wt% konjac aqueous dispersions increased with increasing $C_{MC}$ at $C_{MC} \leq 0.5$ wt%, and had the greatest value at $C_{MC} = 0.5$ wt%. $\Phi$ for 3.0 wt% samples decreased slightly with increasing $C_{MC}$ at $C_{MC} > 0.5$ wt%, but it did not depend on CMC too much.

$\Phi_{max}$ for konjac aqueous dispersions with MC decreased with increasing $C_k$, and $C_{MC}$ with $\Phi_{max}$ increased with increasing $C_k$ (Table 3). This indicates that it became harder to form bubbles in the konjac aqueous dispersions at higher $C_k$, and thus $C_{MC}$ for $\Phi_{max}$ increased with increasing $C_k$. Moreover, adding a small amount of MC, which was between 0.2 and 0.5 wt%, was more effective in forming bubbles in the dispersions. As mentioned above, 1.0 wt% konjac aqueous dispersions with MC were not stable. However, 2.0 wt% and 3.0 wt% konjac aqueous dispersions with MC were stable for more than 180 min after their preparation, and the separation of bubbles and dispersions did not occur. It is thought that adding MC with higher $C_{MC}$ to konjac aqueous dispersions had a smaller effect on forming bubbles, but the bubbles formed were stable in the dispersions.

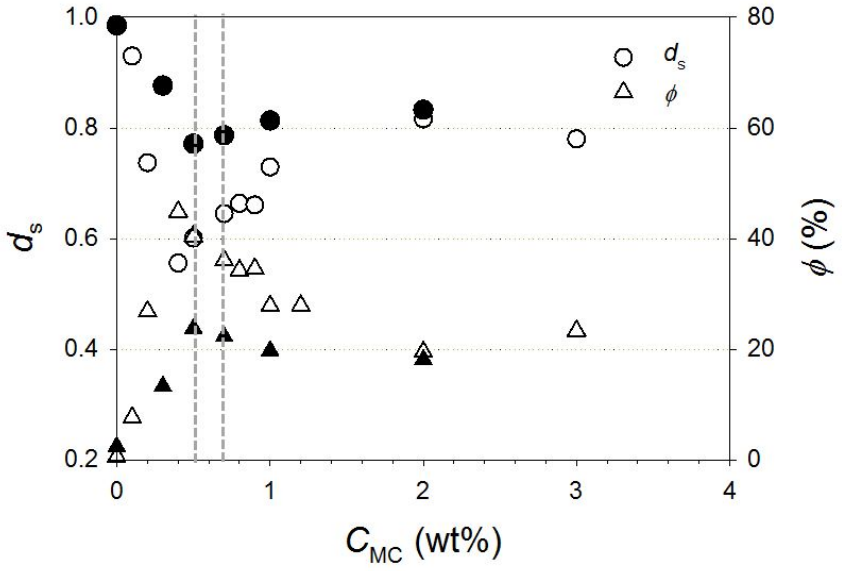


**Figure 8** **Methylcellulose (MC) concentration $C_{MC}$ dependence of specific gravity $d_s$ and apparent bubble content $\Phi$ of 2.0 wt% (open) and 3.0 wt% (solid) konjac aqueous dispersions added MC (open). Measurements were made at 25.0 °C**

**Table 3** **Maximum values of apparent bubble content $\Phi_{max}$ for konjac aqueous dispersions with methylcellulose (MC) and those MC concentrations $C_{MC}$. Konjac flour concentration $C_k$ was varied between 1.0 and 3.0 wt%**

| | $C_k$ = 1.0 wt% | $C_k$ = 2.0 wt% | $C_k$ = 3.0 wt% |
|---|---|---|---|
| $\Phi_{max}$ (%) | 59.2 | 44.9 | 23.8 |
| $C_{MC}$ | 0.2 | 0.4 | 0.5 |

$C_k$ of commercial konjac gels is usually around 3.0 wt%. From these results, it is thought that adding MC to konjac aqueous dispersions would be effective in creating a new texture of konjac gels with many bubbles. Moreover, aerogels are receiving attention as a modern, advanced food. They are usually produced based on polysaccharides (García-González & Amirnova, 2011; Mikkonen, Parikka, Ghafar, & Tenkanen, 2013), so the mixture of konjac and MC is expected to become a new food ingredient.

## Conclusions

The specific gravity of konjac aqueous dispersions did not change when prepared by changing stirring methods (timing and time). So the apparent bubble content could not have changed in the konjac aqueous dispersions by changing the preparation methods, although the konjac itself showed the ability to produce bubbles.

However, it was found that adding foam stabilisers, such as gum arabic, methylcellulose (MC), pullulan, and soluble soybean polysaccharides to the konjac aqueous dispersions decreased the specific gravity of konjac aqueous dispersions and formed more bubbles in the dispersions.

Above all, the specific gravity for the sample added MC was the lowest, and the apparent bubble content of the sample added MC was the highest. Furthermore adding a lower concentration of MC, which was between 0.2 and 0.5 wt%, to the dispersions was more effective in making bubbles. Although the apparent bubble content of the konjac aqueous dispersions with MC decreased with increasing konjac flour concentration, the state of the konjac aqueous dispersions became more stable with increasing konjac flour concentration. Therefore, it is considered that MC was the most effective to make a new texture of konjac products.

## Acknowledgements

We would like to thank Uenoya Corporation (Mie, Japan), Shin–Etsu Chemical Co. Ltd. (Tokyo, Japan), Hayashibara Co. Ltd (Okayama, Japan), and Fuji Oil Co. Ltd. (Osaka, Japan) for their provision of samples.

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# Income and long-term care planning

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## Abstract

*With increasing numbers of adults in the USA turning age 65 each day, the demand for long-term care supports and services is expected to rise. Although low income has been associated with higher risks of disability, nursing home placement and healthcare costs, there has been a lack of attention to how income affects personal long-term care planning. The goal of this study is to examine the relationship between long-term care planning by household income.*

*A nationally representative telephone survey on current and future use of long-term care services and supports, was conducted with 714 adults aged 45+. Using chi-square, analysis of variance, and multiple regression techniques, intention to utilise long-term care planning was explored by income (<$25,000, $25,000–$49,999, and $50,000+), age, living arrangement, race, self-rated health status, being alone, ability to take care of oneself, ability to drive, feeling a burden on one's family, not being able to do things one likes to do, and not having enough money.*

*For participants in the lowest income group, being alone contributed significantly to their intent to intention to use long-term care counselling and care coordination services. Age, not having enough money to stay in home, and not being able to take care of oneself influenced participants in the highest income group. Findings suggest that financial counsellors and planners should encourage their clients to include advanced care planning needs and costs into their long-term care planning and tailor financial advice in light of personal needs, concerns, and income.*

**KEYWORDS: LONG-TERM CARE; OLDER CONSUMERS; FINANCIAL COUNSELLING**

## Introduction

Since 2011, the oldest members of the baby boom generation in the United States (born 1946—1964) have been turning age 65 at the rate of 8,000 people per day (AARP, 2011). By 2030, this number will be twice as many older adults (71.5 million) than in 2000 (35 million) (AARP, 2011). Their collective efforts to avoid institutionalisation and age in place in their homes and communities are expected to place considerable demand on their personal finances and our existing healthcare systems.

Supportive ageing services known as *home and community-based services* (HCBS) are designed to help older consumers ageing in place, receive the help they need, and maintain their quality of life. The availability and scope of HCBS is growing nationally (Harrington, Ng, Kaye, & Newcomer, 2009). In

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2011, *case management services* (CM) offered with HCBS programs provided over 3.6 million hours of assistance in assessing needs, developing care plans, and arranging services (Administration on Aging, 2012). These programs include transportation services, homemaker services, home-delivered meals, and adult day care for older consumers or their caregivers (Administration on Aging, 2012). Eighty percent of CM clients reported they could better care for themselves after receiving services arranged by their CM (Administration on Aging, 2012). The targeted use of care coordination services and long-term care planning services ultimately helps improve awareness of HCBS options and facilitates the ability of persons to stay in their homes and communities. Considerable research has been conducted on predicting service utilisation (e.g., Alkema, Reyes, & Wilber, 2006; Borrayo, Salmon, Polivka, & Dunlop, 2002; Borrayo, Salmon, Polivka, & Dunlop, 2002; Casado, van Vulpen, & Davis, 2011; Chen & Berkowitz, 2012; Min, 2005), yet none of these demonstrated how different income groups plan for long-term care and care coordination services. Thus, this paper aims to analyse how different income groups among older consumers perceive the importance of long-term care counselling and care coordination.

## Literature review

Demographic characteristics such as age, gender, living arrangements, educational attainment, and race and ethnicity are important factors predicting perception and availability of overall ageing services (Andersen, 1995). Alkema et al. (2006) reported that older consumers were more likely to access supportive services as they aged, women used home safety services and support services more frequently than men, and individuals living alone were more likely to use transportation services than persons living with someone else. Living alone has also been linked to nursing home placement (Miller & Weissert, 2000). Opoku and colleagues (Opoku et al., 2006) found that people with post-secondary educations were more likely to access community services than persons with less than a high school education. Educational attainment has also been associated with the use of home safety services (Alkema et al., 2006). Some differences in service needs also occur by race/ethnicity. Blacks reportedly have greater unmet service needs than Whites for homemaker services, home-delivered meals, and transportation services (Casado et al., 2011). Additionally, non-Hispanic Whites were most likely to reside at a nursing home or assisted living facility than to utilise HCBS programs (Borrayo et al., 2002).

Health status is another important factor. Persons in better health are more likely to rely on family for help instead of seeking community-based services than individuals rating their health as poor or fair (Min, 2005). A person's inability to complete their activities of daily living (e.g., eating, dressing, and bathing) (ADLs) and instrumental activities of daily living (e.g., shopping, using the telephone) (IADLs) inform the type of treatment and amount of care provided (Andersen, 1995). Being physically unable to take care of oneself and living independently are typical concerns for many older adults. Being a burden to one's family is also something most people try to avoid. However, in the course maintaining independence, the pressures placed on others to provide physical and financial assistance often creates health problems and stress for caregivers (National Alliance for Caregiving and AARP, 2009). Independence come at a cost when visual, cognitive, and physical health required to drive diminish (Alsnih & Hensher, 2003; Owsley, 1999). Not being able to drive is a personal freedom few older drivers will readily give up (Hakamies-Blomqvist & Wahlström, 1998).

Other personal concerns about ageing include financial insecurity. When unplanned expenses such as out-of-pocket health care costs and home maintenance costs become worrisome, they undermine plans to remain living at home (Lynch & Pryor, 2012). This would become worse among low-income consumers and their family. Household income is influenced by the economy, politics, and public policy, and can be deemed unreliable or inaccessible at times (Borrayo et al., 2002). For example, being low-income is associated with a high risk of disability, nursing home admission and high healthcare costs (Cooper, Cooper, McGinley, Fan, & Rosenthal, 2012; Miller & Weissert, 2000; US Bureau of Labor Statistics, 2013). Escalating healthcare costs can ultimately threaten the financial stability and quality of life of low-income adults especially when they are forced to choose between paying for healthcare or other living expenses (Hong & Kim, 2000). In addition, among low-income consumers loneliness and isolation contribute to serious health problems and can hasten death (Kim, 2012; Savikkoa, Routasaloa, Tilvisa, Strandberg, & Pitkäläa, 2005). Nevertheless, few researchers have explored low-income consumers' intention to use long-term health care counselling and care coordination services. The study comparing the needs of different income groups are much in need. Addressing the gap, our specific objectives are: 1) to analyse the impacts of demographic

characteristics and ageing concerns on predicting intention to use long-term care counselling by household income levels; and 2) to investigate the impacts of demographic characteristics and ageing concerns on predicting intention to use care coordination services by household income levels.

## Results

### Descriptive statistics

The descriptive statistics for the total sample and for the three income groups are presented in Table 1, with the right column providing information on tests of significant differences among the three groups for each variable. Characteristics of respondents representing the three income groups were significantly different by age, sex, educational attainment, living arrangement, SRH, and the personal concern of not having enough money to stay at home.

As shown in Table 1, the ANOVA findings revealed that all of the income groups differed significantly by age and concern about *not having enough money to stay in their home*. Younger participants generally reported higher incomes than older participants. High-income earners were also more likely to be male and White non-Hispanic. Significantly more members in the high-income group perceived their health as good or excellent (86.6%) compared to respondents with lower income (57.3% g middle-income (78.2%). Members of the low-income group were more likely to have concerns about ageing across all six items presented than respondents with higher incomes.

Multiple linear regression analyses were conducted to predict intention to use ageing services by income. Tables 2 and 3 show findings for each of the predictor variables: *counselling about long-term care options and planning*, and *help in coordinating services you might need*. Overall, the model explained the largest variances in the low-income group.

### Long-term care counselling

Among respondents representing the low-income group, 24.5% of the total variance in predicting use of long-term care counselling was accounted for by the independent variables ($R^2$ = .245, $F$ (14, 227) = 4.946, $p$ < .001) as seen in Table 1. Similarly, 14.0% of total variance was accounted for by the same variables for the middle-income group ($R^2$ = .140, $F$ (14, 203) = 2.199, $p$ < .001), and 18.9% of total variance ($R^2$ = .189, $F$ (12, 247) = 3.870, $p$ < .001) was accounted for with the high-income group. Respondents in the low-income group concerned about being alone were clearly more intent on using long-term care counselling than respondents not concerned about being alone. Also individuals who were physically unable to take care of themselves were more likely to use long-term care counselling.

Among respondents in the middle-income group, there were no statistically significant relationships between variables and the intention to use long-term care counselling (Table 2).

Within the high-income group, persons aged 85+ were less likely to use long-term care counselling than persons aged 45—64. However, individuals who were concerned more about not having enough money to stay in their home and being physically unable to take care of themselves were more likely to use long-term care counselling regardless of age.

### Care coordination

As income level rose, respondents' perceived need for care coordination services decreased (Table 3). Within the low-income group, 44.4% of total variance in accessing care coordination services was accounted for by the 14 independent variables ($R^2$ = .444, $F$ (14, 233) = 12.476, $p$ < .001). Total variance decreased to 38.5% for the middle-income group ($R^2$ = .385, $F$ (14, 202) = 8.395, $p$ < .001), and dropped again to 25.1% of total variance ($R^2$ = .251, $F$ (14, 249) = 5.618, $p$ < .001) for high-income group.

Among members of the low-income group, persons aged 75+ were less intent to use care coordination than younger respondents. Those respondents who perceived their health as good or excellent were also less likely to seek care coordination services than persons in poor or fair health. Moreover, participants concerned about *not having enough money to stay in your home*, *not being able to drive*, and *being alone* were most likely to access care coordination services in the future.

**Table 1 Characteristics of the sample**

| Variables | Total Sample | | Low Income < $25,000[a] | | Middle Income $25,000—$49,999[b] | | High Income ≥ 50,000[c] | | Significant Difference | |
|---|---|---|---|---|---|---|---|---|---|---|
| *N* | 714 | % | 241 | % | 211 | % | 262 | % | | |
| **Demographic characteristics** | | | | | | | | | | |
| Age ([ab], [ac], [bc]) | 72.93 | 12.45 | 78.41 | 10.62 | 73.87 | 11.01 | 67 | 12.62 | $F = 62.13$ | $p < .001$ |
| Age 45—64 | 189 | 26.50 | 26 | 10.80 | 49 | 23.20 | 114 | 43.50 | $X_2 = 70.68$ | $p < .001$ |
| Age 65—74 | 183 | 25.60 | 49 | 20.30 | 57 | 27.00 | 77 | 29.40 | $X_2 = 5.70$ | $p = .058$ |
| Age 75—84 | 165 | 23.10 | 71 | 29.50 | 56 | 26.50 | 38 | 14.50 | $X_2 = 17.79$ | $p < .001$ |
| Age 85+ | 177 | 24.80 | 95 | 39.40 | 49 | 23.20 | 33 | 12.60 | $X_2 = 48.84$ | $p < .001$ |
| Female | 481 | 67.40 | 188 | 78.00 | 143 | 67.80 | 150 | 57.30 | $X_2 = 24.62$ | $p < .001$ |
| Education beyond high school | 410 | 57.40 | 76 | 31.50 | 123 | 58.30 | 211 | 80.50 | $X_2 = 123.37$ | $p < .001$ |
| Non-Hispanic White | 633 | 88.70 | 209 | 86.70 | 183 | 86.70 | 241 | 92.00 | $X_2 = 4.56$ | $p = .102$ |
| Live alone | 270 | 37.80 | 144 | 59.80 | 80 | 37.90 | 46 | 17.60 | $X_2 = 95.04$ | $p < .001$ |
| SRH: Good to excellent | 530 | 74.20 | 138 | 57.30 | 165 | 78.20 | 227 | 86.60 | $X_2 = 59.11$ | $p < .001$ |
| **Personal concerns** | | | | | | | | | | |
| Not having enough money to stay in your home ([ab], [ac], [bc]) | 2.19 | 1.18 | 2.45 | 1.22 | 2.2 | 1.15 | 1.94 | 1.1 | $F = 12.22$ | $p < .001$ |
| Being physically unable to take care of yourself | 2.47 | 1.19 | 2.53 | 1.21 | 2.48 | 1.21 | 2.42 | 1.16 | $F = .55$ | $p = .578$ |
| Being a burden on your family | 2.25 | 1.28 | 2.35 | 1.31 | 2.23 | 1.27 | 2.18 | 1.25 | $F = 1.19$ | $p = .304$ |
| Not being able to drive | 2.46 | 1.28 | 2.47 | 1.32 | 2.55 | 1.3 | 2.39 | 1.24 | $F = .85$ | $p = .427$ |
| Being alone | 1.91 | 1.15 | 2.04 | 1.21 | 1.87 | 1.16 | 1.82 | 1.07 | $F = 2.44$ | $p = .088$ |
| Not being able to do the things you like to do | 2.63 | 1.18 | 2.68 | 1.2 | 2.7 | 1.17 | 2.54 | 1.17 | $F = 1.36$ | $p = .259$ |

*Note.* Mean (SE) for continuous variables; column percent for categorical variables.
Coefficients in bold lettering differed significantly among three income groups at $p < .05$.
The pairs of letters [a, b, c] represent the means of the income groups that are significantly different from each other at the 0.05 percent confidence level. For example, when considering the age variable, the letters [ab] show that the average age of Low Income Group is significantly different from that of Medium Income Group.

Members of the middle-income group who lived alone were more intent on using care coordination services than respondents from other income groups. Although, persons in the high-income group concerned about *not being able to drive* were most likely to look for assistance in coordinating their care. However, White non-Hispanic persons in the high-income group were less likely to use care coordination than persons of other races/ethnicities.

**Table 2 Results of the standard multiple regression on intention to use long-term care counselling by household income**

| Variable | Long-Term Care Counselling | | | | | |
|---|---|---|---|---|---|---|
| | Low Income < $25,000 | | Middle Income $25,000—$49,999 | | High Income ≥ 50,000 | |
| | *B* | *p* | *B* | *p* | *B* | *p* |
| Age 65—74 | -.081 | .380 | .082 | .352 | -.016 | .811 |
| Age 75—84 | -.177 | .084 | -.043 | .632 | -.071 | .284 |
| Age 85+ | -.184 | .089 | .007 | .940 | -.178 | .013* |
| Female | -.011 | .859 | .045 | .525 | .064 | .291 |
| Live alone | -.040 | .535 | .023 | .757 | .011 | .862 |
| Education beyond high school | -.039 | .525 | -.065 | .347 | -.038 | .532 |
| Non-Hispanic White | -.083 | .188 | .008 | .909 | -.096 | .117 |
| SRH: Good to excellent | .015 | .819 | .078 | .272 | -.007 | .907 |
| Not having enough money to stay in your home | .111 | .134 | .080 | .344 | .254 | .000*** |
| Being physically unable to take care of yourself | .188 | .049* | .165 | .094 | .183 | .036* |
| Being a burden on your family | .067 | .410 | .091 | .336 | -.044 | .617 |
| Not being able to drive | -.026 | .718 | .065 | .473 | -.069 | .380 |
| Being alone | .198 | .005** | .037 | .667 | -.073 | .342 |
| Not being able to do the things you like to do | .020 | .802 | -.020 | .817 | .087 | .279 |
| $R^2$ | .245*** | | .140*** | | .189*** | |

*Note.* *$p$ < .05; **$p$ < .01; ***$p$ < .001, Age reference group: 45—64

## Discussion and conclusion

Discussion and conclusion

Our model explained greater variances for the low-income group than the other two income groups in the intention of use ageing services such as long-term care counselling and care coordination. Our results are consistent with previous findings that suggest that health and personal concerns are the strongest predictors of service use (e.g., Andersen, 1995; Penning, 1995; Wolinsky, 1994).

Personal concerns about *not having enough money to remain at home* have the strongest impact on a respondent's likelihood of using ageing services in the future. For respondents in the low-income group, *not having enough money to stay in one's home* influenced their intention to seek care coordination services. When faced with limited resources, persons with low incomes may not have enough options in the present and future (Xiao & Noring, 1994).

Adults earning a low income (less than $25,000) are likely to view their future service needs in terms of what Medicare and Medicaid services will cover and often do not envision utilising additional services, even in coordinating their care. They are more likely to save for daily expenses, while adults in the middle-income group are more likely to save for emergencies, and high-income earners are more likely to save for the future (Xiao & Noring, 1994).

Concerns about not being able to drive also impacts the intention of using help coordinating services for the low-income group. Low-income people are more likely to report poorer health and need more assistances with (I)ADLS. Many are unlikely to be able to drive physically or financially. Overall, the middle-income group has the lowest intention to use both long-term counselling and care coordination services. Because financial resources and health status are more likely to decrease as

age increases after retirement. People in the middle-income group are easy to drop into the low-income group, and their health status may also decline while getting older. Thus, it is reasonable that when middle-income group concerns more about being a burden on their family financially, physically, and emotionally are more likely to seek help to reduce the potential burdens of other family members.

For the high-income group, concerns about *being physically unable to take care of yourself* have strong impacts on both the intention to use long-term counselling. Because more people in this group are younger, better educated, males, and living with others, they are more willing to do advance care planning to understand the costs. Within the high-income group, non-Hispanics Whites were least likely to seek help in coordination services. The result is consistent with what Borrayo et al. (2002) found that non-Hispanic Whites were less likely to be in home and community-based services than to be in a nursing facility or assisted living facility.

While study findings suggest that income alone can be used to predict future service utilisation, it is not a reliable indicator across all age groups. Age and perceptions about ageing need to be considered with health status—which is consistent with the finding of Brossoie and colleagues (Brossoie, Roberto, Willis-Walton, & Reynolds, 2010). Like them, we suggest that adults aged 45—64, who have yet to face declining health or help care for persons in declining health, tend to envision their futures as being healthy without the need for supports or services. Similarly, older adults aged 75+ who are living in the community have likely identified services already and therefore do not envision themselves as needing additional help in coordinating their care in the future. In reality, despite how one might perceive one's future, rising health care costs threaten financial well-being, especially among low income older adults (Hong & Kim, 2000). Rising healthcare costs often force older adults to choose between their health care and other expenses which promote their quality of life.

**Table 3 Results of the standard multiple regression on intention to use care coordination by household income**

| Variable | Care Coordination | | | | | |
|---|---|---|---|---|---|---|
| | Low Income < $25,000 | | Middle Income $25,000—$49,999 | | High Income ≥ 50,000 | |
| | ß | p | ß | p | ß | p |
| Age 65—74 | -.236 | .813 | .072 | .335 | -.035 | .583 |
| Age 75—84 | -2.349 | .020* | -.077 | .315 | -.121 | .058 |
| Age 85+ | -2.380 | .018* | -.061 | .427 | -.071 | .297 |
| Female | .800 | .425 | .024 | .694 | .079 | .175 |
| Live alone | 1.148 | .252 | .177 | .006** | -.008 | .902 |
| Education beyond high school | -.901 | .369 | .015 | .801 | .020 | .722 |
| Non-Hispanic White | -.273 | .785 | -.015 | .803 | -.147 | .013* |
| SRH: Good to excellent | -2.097 | .037* | .024 | .694 | -.001 | .985 |
| Not having enough money to stay in your home | 3.053 | .003** | .104 | .149 | .126 | .059 |
| Being physically unable to take care of yourself | 1.776 | .077 | .047 | .573 | .170 | .041 |
| Being a burden on your family | -.479 | .633 | .258 | .001** | .002 | .978 |
| Not being able to drive | 2.230 | .027* | .145 | .062 | .167 | .028* |
| Being alone | 3.825 | .000*** | .116 | .109 | .087 | .233 |
| Not being able to do the things you like to do | 1.766 | .079 | .115 | .110 | .037 | .632 |
| $R^2$ | .444*** | | .385*** | | .251*** | |

*Note.* *$p$ < .05; **$p$ < .01; ***$p$ < .001, Age reference group: 45—64

Our findings suggest that older adults representing the middle-income group ($25,000—$49,999) pose the biggest challenge for retirement and financial planners as they are the most difficult to predict in their intention to use ageing services. Yet, any sudden changes in the economic climate coupled

with unforeseen personal misfortune will quickly place them at economic risk, limiting their future plans and requiring adjustments to their long-term financial plans.

Advanced care planning covering in-home, community, and institutional services and long-term care insurance needs to be included in the long-term planning process. Financial counsellors and planners can tailor their messages to clients about including ageing services in their long-range planning based on the client's age, income, health status, and concerns about ageing. Financial counsellors and planners can be potential resources in raising awareness about the scope of ageing services, promote planning for healthy ageing, and facilitate older adults' in their quest to age in place in their homes.

## Methods

### Data and sample

A nationally representative telephone survey on current and future use of long-term care services and supports, was conducted with 714 adults aged 45+ during June and July 2010. Using chi-square, analysis of variance, and multiple regression techniques, intention to use long-term care counselling and care coordination was explored by different household income groups (< $25,000, $25,000—$49,999, and $50,000+).

### Measurements

*Dependent variables*

The two dependent variables included *counselling about long-term care options and planning*, and *help in coordinating services one might need*. Respondents' likelihood to use each service was measured with a Likert scale response set in which 1 = *not at all likely to use* and 4 = *very likely to use*.

*Independent variables*

The independent variables were included for our analysis. Dummy variables were used for gender, education, race/ethnicity and living arrangement, using a 1/0 coding scheme. Age was grouped as 45—64, 65—74, 75—84, and 85+ years, to capture variations in responses from middle age into late life. Self-rated health (SRH) was assessed by the following question: *Would you rate your current health as excellent, good, fair, or poor?* Responses rated as excellent or good were coded 1 and 0 for otherwise. Personal concerns were measured by a four point Likert scale in which 1 = *not at all concerned* and 4 = *very concerned*.

### Statistical analysis

All data were screened for accuracy by examining frequency distributions, measures of central tendency and variance to detect out-of-range values. To handle missing data, cases were excluded *pairwise* if they were missing data required for analysis, and retained when the required information was available (Pallant, 2010). Chi-square and Analysis of Variance (ANOVA) between groups were employed to identify differences and similarities among the three income groups. Multiple regressions were conducted with two dependent variables to examine variables that affected participants' intention to use long-term counselling and care coordination services. A tolerance value less than 0.10 and a Variance Inflation Factor (VIF) value above 10 were applied to determine the presence of multicollinearity in the multiple regression models following the recommendation of Pallant (2010).

## Disclosure statement

No potential conflict of interest was reported by the authors.

## Biographies

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# Food safety teaching influenced by frames, traditions and subjective selections

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## Abstract

*In Sweden, Home and consumer studies (HCS) are mandatory for all students in compulsory school. This means that schools have the possibility to educate all future consumers in Sweden. Qualitative interviews were performed with ten HCS teachers. A thematic content analysis was performed on the transcribed interviews. Three themes were found, which all had the potential to influence the teachers' didactic choices.* Frame control *includes different frames within the school, for example, budget, lesson time, syllabus, which could imply limitations on the teaching. HCS teaching was characterised by many similarities and routines, which were often performed without reflection, and these were included in the theme* Traditional HCS learning environment*. The third theme* Subjective selections *were characterised by the teachers' individual experiences, knowledge and risk perception. The result indicates that important food safety risk areas risked being neglected or minimalised in the HCS teaching due to limiting frames, non-reflective HCS teaching traditions, or the teachers' lack of knowledge and risk awareness. This could have consequences for what is transferred to the students and thereby influence the student's learning process in relation to food safety.*

**KEYWORDS: FOOD SAFETY, LEARNING, TEACHING, HOME AND CONSUMER STUDIES, DIDACTIC**

## Introduction

In Sweden, Home and Consumer Studies (HCS is the Swedish abbreviation for what is referred to internationally as Home Economics), is a mandatory subject for all students in compulsory school. It is taught during 118 teaching hours, usually spread over the later years of compulsory schooling when the students are aged from 12 to 16 years (Lindblom, 2016). The subject is considered to be consumer education since it is mandatory for all students and thereby reaches all future consumers in Sweden. According to the syllabus, HCS should educate students about health in relation to food. The students should develop an awareness of the consequences of their household choices in relation to health (National Agency for Education, 2011b). HCS lessons include a large practical cooking component where food is the teaching material. This comprises the handling, preparation and storage of different food items, which makes this subject suitable for food safety education. The importance of food

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safety knowledge among the students in relation to health has been highlighted by the Swedish National Agency for Education (National Agency for Education, 2011b).

### Food safety in HCS

The food production chain includes several different actors, such as producers, processors and retailers. However, the consumer, who is the last link in the chain, is very important. S/he is responsible for the last step in the food handling process and, since the home is reported as the origin of many cases of foodborne illness, the consumer has a vital role in the prevention of such illness (Griffith, 2006). Risk-aware consumers can avoid contracting foodborne illnesses and thereby decrease the risk of health implications as well as costs for society (Redmond & Griffith, 2007). Important risk areas related to food safety can be summarised by the Four Cs: *Cooking*, *Cleaning*, *Chilling* and *Cross-contamination* (avoidance of) inspired by the Food Standards Agency in the U.K. (FSA, 2016), and will be used in this article. They all represent different actions related to the handling, preparation and storage of food in ways that can prevent different food hazards, for example, Salmonella and Campylobacter. Earlier studies regarding food safety in HCS have indicated gaps in the teaching. Actions related to *Cleaning* were often included in teaching as routine while actions related to the other three Cs, such as the handling of risk-related foods, cold food storage and chilling down and reheating of food, are all examples of topics that should be highlighted in HCS teaching in order to create future risk-aware consumers (Lange, Göranzon, & Marklinder, 2014, 2016). Regarding food safety, it is important to understand how the HCS teachers communicate different risks to their students. This is influenced by the teachers' didactic choices (*Didactic* in this study is based on the German/Nordic Didaktik analysis tradition, where a holistic view of the process of teaching and learning is in focus that is made from a social context and from the interactive relationship between theory and practice (Moreno Herrera, 2015)).Didactic choices include both the choice of the teaching content and reflection on the teaching process (Bronäs & Runebou, 2010). Marton and Booth (1997) have described different approaches to learning that can be divided into deep and surface approaches. The deep approach is characterised by a critical interaction with the learning content, that is, *learning with understanding*. The other approach, surface, is more of a temporary learning with a focus on memorising facts without further reflection (Marton & Booth, 1997). Even though these concepts have been developed in higher education, they can be applied here to analyse the HCS teachers' choices of learning content and learning tasks regarding the Four Cs. The teachers' didactic choices are influenced by frame factors, that is, factors that limit and to a certain extent determine the teaching process, which will in this article be addressed as for example lesson length, syllabus and budget (Lindblom, 2016). In addition to frame factors, the selection of teaching content will also be affected by teaching traditions in the school, the education of the HCS teacher, his/her teaching experience, level of subject knowledge and personal interest. Uljens (1997) notes that teaching and learning are seen as two interactive elements, two aspects of a whole, but at the same time not interchangeable. Because of this, teachers have to be aware of their teaching process and be able to reflect on how it affects the students' learning process (Postareff, 2007; Uljens, 1997). Due to limiting frame factors, the choice of teaching content becomes a didactic choice, that is, what is excluded/included in teaching and why (Molin, 2006). Previous studies (Abbot, Byrd-Bredbenner, Schaffner, Bruhn, & Blalock, 2007; Green & Knechtges, 2015; Majowicz ,Diplock, Leatherdale, & Bredin, 2015) have revealed flaws in food safety knowledge among young people, and it is, therefore, important to focus on the didactical choices of HCS teachers. Education interventions are found to be effective (Young et al., 2015), but less research has been carried out on food safety educators (Sivaramalingam et al., 2015). The aim of this study was to explore what factors influence HCS teachers' choices of learning content in relation to food safety.

## Data collection method

During 2015, qualitative interviews were performed individually with ten HCS teachers, including eight female and two male teachers. The respondents were recruited through convenience selection from a local network of HCS teachers to achieve a variation of different working years and gender (≈ 7% male HCS teachers in Sweden). To ensure the same basic lines of inquiry in each interview, a mind map was used with four different areas: *Home and consumer studies*, *Policy documents*, *Food hygiene* and *Risk communication* (Patton, 2002). The first pilot interview showed a need for some small adjustments in the phrasing of the interview areas. The second pilot interview showed no need for further adjustments and this interview was therefore included in the study. All interviews were audio

recorded and transcribed verbatim by the first author. The interviews lasted between 30 minutes and one hour. The transcriptions comprised a total of 124 pages of text. During the transcription and analyses, each teacher was given a fictitious name (Table 1). All interviews were performed in Swedish and the quotes were translated verbatim into English following the original utterances as closely as possible. All participating teachers were working as HCS teachers and had formal HCS education, although different working experiences.

**Table 1** **Characteristics of the participating teachers**

| Teacher | Working years | Place of work |
|---|---|---|
| Sophie | 1.5 years | Sophie works with another HCS teacher in a large school (550 students F-9*) on the outskirts of a city. |
| Anna | 3 years | Anna is the only HCS teacher at a relatively small school (about 300 students F-9) in a rural community. |
| Camilla | 7 years | Camilla works with two other HCS teacher in a relatively small 7—9 school with 230 students in a rural community. |
| Christian | 7 years | Christian is the only HCS teacher in a small F—6 school (about 300 students) in a large city. |
| Emma | 9 years | Emma is the only HCS teacher at a large F-9 school (about 500 students) in a rural community. |
| Susan | 12 years | Susan works with two other HCS teachers in a relatively large 7—9 school (about 450 students) in an urban city. |
| Patricia | 16 years | Patricia works as the only HCS teacher at a medium sized 7—9 school (about 400 students) on the outskirts of a large city. |
| Monica | 22 years | Susan works with one other HCS teacher at a relatively large F—9 school (about 450 students) in an urban city |
| John | 25 years | John works together with one other HCS teacher at a large F—9 school (about 800 students) in a city. |
| Elisabeth | > 40 years | Elisabeth works with another HCS teacher at a small F—9 school (about 220 students) in an urban city. |

*Note.* *In the Swedish school system F is the Preschool class, that is, the first class of compulsory education (the students are 5—6 years old) and Year 9 is the last year (the students are 15—16 years old).

## Data analysis

A thematic content analysis was performed in several qualitative steps (Braun & Clarke, 2006; Bryman, 2012). First, all interviews were read several times and comments related to the Four Cs (*Cooking*, *Cleaning*, *Chilling* and *Cross-contamination* (avoidance of)) were marked in the text. After rereading, key concepts were identified and marked in the text (Seidman, 1998; Yin, 2011). The coding was performed manually on paper using different coloured pens and notes. In addition, the qualitative software program NVivo 10 (QSR International Pty Ltd, Australia) was used when categorising the transcripts. Finally, the key concepts were thermalized and structured. Three different sub-themes emerged relating to the teachers' didactic choices: *Frame control*, *Traditional HCS learning environment* and *Subjective selections* (Table 2).

**Table 2** **The analysis process for the thematic content analysis**

| Text from interviews | Key concept | Sub-theme | Themes |
|---|---|---|---|
| 'If you are short on time, of course there will be carelessness…' | Time | Frame factors | Frame control |
| 'I have many routines that I don't understand, because they are carried out automatically.' | Automatic | Routines | Traditional HCS learning environment |
| 'There is no danger related to the minced meat I use.' | Risk unawareness | Experience | Subjective selection |

### Ethical considerations

The Central Ethical Review Board has stated that this kind of research does not require ethical vetting (Central Ethical Review Board, 2015). The ethical rules from the Swedish Research Council (based on the Declaration of Helsinki) were followed during the study (Swedish Research Council, 2002). The teachers were informed in advance that participation was voluntary and that they were able to withdraw their participation at any time. All material has been handled confidentially. Anonymity of the teachers is protected by using fictitious names. After the interview, each participant received a gift of two books to show appreciation for their participation.

## Results

The themes relating to the teachers' didactic choices (Table 2) all have potential to influence food safety teaching and practices in the HCS classroom. They will, therefore, also have the potential to later impact the students' perception of risk as well as their behaviour as future consumers. These themes will now be presented in more detail.

### Frame control

The *school budget* can influence the availability and quality of refrigerators, as shown in the following example, and was therefore included as one frame factor. The refrigerator could be placed outside the classroom or used by many different classes and teachers, which could have an impact on how the issue of cold food storage could be included in teaching. But even the refrigerator design and model could affect the choice of teaching in relation to cold food storage.

| | |
|---|---|
| Interviewer | Do you teach about refrigerator temperature? |
| Elisabeth (>40 working years) | Yes, not the exact temperature, but we read on the packages and I have a thermometer in the refrigerator and that it is coldest at the top and less cold lower down and I explain to the students that it is what it is like in a refrigerator |
| Interviewer | But new refrigerators have a fan and then the temperature will be evenly distributed… |
| Elisabeth | Yes… [laugh] well that maybe the case but I have an old refrigerator in school… |

The *HCS syllabus* includes three different perspectives that should permeate all HCS teaching. In addition to health, economy and environmental aspects form the core perspectives of the HSC syllabus. When Elisabeth discusses the washing of dishes during her teaching she chooses the perspective of the environment as her teaching goal:

> I teach the students how to wash the dishes in an eco-friendly and smart way, that they should have this in their spinal cord, so I tell them that regardless of whether you are in your summerhouse or in a caravan or the dishwasher is broken you should know how to wash the dishes in an eco-friendly way: wash, rinse, turn over … Elisabeth (>40 working years)

This *dish-washing chant* that Elisabeth described as *wash*, *rinse*, *turn over* seems to be a kind of a typical HCS dishwashing chant transferred to the students. Emma described another typical chant: *glasses*, *plates*, *cutlery* and *pots*. Sophie even described how, during her lessons, she asks the students if they remember how to wash dishes in the HCS way. Camilla also discussed how the subject perspectives would have an impact on her teaching choices in relation to washing dishes:

> Sometimes you have to wash the chopping board under running water with a little hot water and extra detergent and then the discussions about hygiene are about how you can't always do things the same way because then hygiene competes with finances or the environment, and what is the best food poisoning or that one time we wasted some water. (Camilla—7 working years).

A HCS classroom is often used by hundreds of students every week, so hygiene actions are important but can suffer due to the limited amount of time, which can be seen as an important frame factor. The teachers described the lack of time at the end of lessons as a recurring problem that could be related to the teachers' choices regarding the amount of teaching content. Patricia works at a medium-sized school (400 students) on the outskirts of a large city, and she described how the lack of time can have an impact:

> If you are pushed for time, of course, there will be carelessness, and you have seen in this kitchen that they have been pushed for time, and then it immediately gets dirty and greasy; you have to spend time cleaning… I think that if you are short on time that is what will suffer.(Patricia—16 working years).

### Traditional HCS learning environment

The learning activities described by the teachers seemed to follow the same pattern: a short introduction followed by cooking a meal and ending with cleaning practices and reflection if time allows. It was commonly perceived that the subject should include cooking a meal otherwise the students would be disappointed. This kind of pattern can be described as a *Traditional HCS learning environment*. There were only a few examples of some more experimental cooking, and the meal was seen as the focus of the lessons. This was also reflected during the interviews, since teaching content related to chilling and reheating of food seemed to have been deselected, as stated by Anna who works in a relatively small school with around 300 students:

> …most is usually eaten so if you mean chilling down food, so no, that does not occur as it is consumed. (Anna, 3 working years)

The participating teachers could easily describe *what* choices of teaching content they had made, and *how* that was taught during their lessons. Problems arose when they should discuss *why* they had made these didactic choices or *why* different routines were performed in the HCS classroom. For example, in the HCS classroom, the kitchen utensils are often washed by the students at their kitchen units, while porcelain, glasses and cutlery are washed in the dishwashing machine, often without further reflection. Sophie works at a relatively large school (550 students), which means that many students would eat during the HCS lessons and, according to her, would thereby increase the risk of infecting each other:

| | |
|---|---|
| Sophie (1.5 working years) | Everything that they eat from and deep dishes, bowls, plates, glasses, cutlery we wash in the dishwashing machine… |
| Interviewer | Why do you always wash plates and glasses in the dishwashing machine? |
| Sophie | For hygiene reasons, of course…then I say that we wash everything in this as we are so many children at this school, if you cannot wash up in that then many would probably become ill here. |

Unquestioned routines can also feel boring because they are repeated over and over again. In terms of food safety, cleaning actions are important even though they are reproduced as a routine:

> I don't know, because it is boring? When you mentioned it, I don't know, I have no idea, because it should be done in next to no time, I guess… I have many routines that I don't get, because they are done automatically. (Camilla—7 working years).

### Subjective selections

People perceive risk and hazards in different ways based on, for example, experience and culture (Lupton, 2000). Teachers make no exception to this basic rule. Teachers' perceptions of food-related risks might have an impact if they fail to differentiate between high-risk actions and low-risk actions in the classroom. When discussing risk-related food during the interviews, chicken was mentioned as the most risk-related food item used in HCS. Teaching related to chicken often included extra hygiene instructions and actions, such as washing knives and chopping boards in the dishwashing machine. However, raw minced meat was not considered to be a risk-related food in comparison with chicken. This could be due to a perception of safe purchases. Monica works in an urban city school, and her retailers buy their meat from a local slaughterhouse, which Monica perceived as a substantial risk reducer:

> There is no need to worry about my minced meat as I buy good locally produced meat from a good store nearby the school. It would be a completely different thing if I had to buy from a large retailer. (Monica—22 working years).

While handling chicken, communication about risk was considered to be obvious, but in relation to raw minced meat, risks were perceived to be lower. This subjective selection might be due to the teachers' experience or attitude to the perceived risk. Susan described how tasting raw minced meat was not related to risk:

> No, it is like this that I often build on their prior knowledge and if they have seen their mother or grandmother taste the minced meat and they tell me that, yes you can do that, that it is great, but I do not encourage them all to go and taste the minced meat, that is not a part of this, rather to evaluate the taste of the meatballs. (Susan—12 working years).

Even though all participating teachers could recall personal incidences of foodborne infections, they could not relate them to their choice of teaching content. For example, Emma decided once to use her experience of foodborne illness in her teaching. However, the result turned out to be quite unsuccessful and illustrates difficulties with didactic choices when communicating risks to the students:

> Yes, I got this Campylobacter when I was abroad so then I thought I had food poisoning…that is my own experience which I tell the students about sometimes when we talk about things that can happen if you don't cook food thoroughly, such as chicken. Or if you don't handle food in a good way but risk cross-contamination, or that you have to wash your hands when we are going through that, but look at your hands how do they look, and so personal hygiene that germs really are a source of infection on the hands where there are a lots of folds for germs to stick to… I tried once to talk about my food poisoning and then go into detail about Campylobacter and risks, yes, everything like, but then the students didn't want to eat the chicken at all, so it was not so good… (Emma—9 working years).

Teaching and learning in HCS classrooms differs from other school subjects with its large practical cooking component that requires skilful handling and preparation of different food items. Ordering, preserving and using different food items are key parts of HCS teachers' preparatory work. Some teachers' described how they wanted to have control over the food handling and therefore put food out and measured it in advance before the lesson began. Elisabeth has long working experience, and she prefers to prepare food items in advance.

> You should not take from the students' lesson time… it is a part of our job that the stuff has to be presented. (Elisabeth >40 working years).

John and Camilla had a completely different opinion regarding this. They have chosen to use these actions as a learning opportunity and made them an important part of their teaching content. Camilla practised this at her school, a relatively small one in a rural community:

> Things might end up in the wrong place or they might take the wrong amount…usually they put it back, but of course there are those who don't and I see that as a problem, I don't like to load up everything on a small cart and walk like an old lady from the Curriculum of 1969 when I know that after we have had them for three years they are well-trained… it's working but you have to practise it. (Camilla 7 working years).

John, a HCS teacher with twenty-five years working experience, shared Camilla's way of teaching:

> Well, I don't put anything out, they go and get it themselves that is no problem…I don't measure up anything… I do point out the importance of taking the right amount or else the recipe will not work. (John—25 working years)

A recurring subject of discussion during the interviews was chopping boards, which could involve problems with drying facilities or the lack of money to buy new ones. In some HCS classrooms, coloured chopping boards were used for different food items, and this was something that Christian, who works at a relatively small school, had thought about:

> I have thought that you should have different ones but it is often not that way at home, that you have different colours, so then it is perhaps foolish to have them here. (Christian 7 working years)

## Discussion

We have described here different themes in relation to the teachers' didactic choices regarding food safety issues. It is important to further discuss how different didactic choices influence the teaching and the students' learning. The students are soon to start their own households as young consumers. Therefore it is of importance to consider the routines and practices they have learned during HCS lessons: how relevant are they and how transferable are they? Despite current living conditions, they will, as future caregivers, probably prepare food for others that are more at risk of foodborne illnesses (e.g. elderly persons, young children, and pregnant women) therefore food safety knowledge is not only important for themselves (Abbot et al., 2007).

### Frame factors

We have shown how didactic choices could be affected by *Frame control*. Time, or rather lack of time, was a frame factor that could lead to carelessness in cleaning at the end of the lessons. However, other HCS researchers have noticed that lack of time was rarely the problem as the stress at the end of the lesson was almost the same, regardless of the length of the lesson (Lindblom Erixon

Arreman, Bohm, & Hörnell, 2015). Teachers' didactic choices of teaching content are therefore of key importance: what is chosen to be discussed and practised with the students and why (Venäläinen, 2015). Teachers should reflect upon this in order to avoid practices which are unquestioned and routinized. Another frame factor is the syllabus. Health, economy and the environment should, according to the syllabus, permeate all HCS and this became clear during the interviews. It is of great importance that the teachers have the didactic skills and the knowledge to integrate food safety issues and risk communication into the syllabus perspectives. Otherwise, important food safety areas risk being neglected from the teaching in favour of other perspectives. This integration can be done, but if they remain unreflective, the students will fail to learn the importance of good food hygiene practices in the kitchen. Our data shows that this is a potential risk, since many activities in the classroom are routine-like and therefore in danger of not being reflected on. It is however of importance to see these themes as overlapping each other and not running parallel. For example regarding refrigerator temperature where a frame factor like the model of refrigerator affected the teacher subjective choice of teaching.

**Everyday practices**

Freshly cooked meals were prepared and eaten during the HCS lessons. As noted before, there is a risk that actions such as cooling down and reheating of food are neglected in the teaching (Brunosson, Brante, Sepp, & Mattsson Sydner, 2014; Höijer, 2013; Lindblom, 2016). This was also noticed in a survey of HCS teachers (Lange et al., 2014). The HCS instructions include learning about everyday life and the processes carried out in the home, except in another environment that is the school (National Agency for Education, 2011a). Höijer (2013) noticed that this important connection often remains vague for the students and instead they perceived HCS teaching as a utopia far from their own life at home. This could also be considered an important risk area as the reheating of food was left out of the teaching content. The majority of the students in Lange et al. (2016) reported reheating food in a microwave oven several times a week, and many did this every day. This is a good example of a divergence between school-learned practices and everyday practices. Teaching about risks related to the reheating of food was often left out as all food is eaten during the lessons. If HCS only focuses on activities that fit into the school context, important food safety issues linked to the students' everyday lives are at risk of being neglected in the teaching. With more experimental teaching, the students have the opportunity to reflect upon daily practices from different angles. The teacher's didactic choice can help the students to attain deeper levels of learning that is learning with understanding (see Marton & Booth, 1997; Postareff, 2007). Teachers should also focus more on transferability of school-learned issues (Tuomi-Gröhn & Engeström, 2003). If the students see how new skills and knowledge can be used in their everyday practices, they can better understand the reason for learning them (Palojoki, 1997). Combining theory with practice in HCS, referred to as *knowing in practice*, has been shown to be valuable when teaching students about food safety (Bielby et al., 2006; Egan et al., 2008; Haapala & Probart, 2004). In some countries (e.g. Malta, UK, Estonia) the students bring food from home to their HCS lessons. In Sweden and Finland, it is the individual HCS teacher who purchases all the food used, which is then paid for by the school. The teachers, therefore, decide on the different food items that will be used for each lesson. This is an opportunity for students to learn how to handle, prepare and store different foods in a safe way. Some teachers prepare everything in advance, and some let the students collect food themselves from refrigerators, cupboards or pantries (Höijer, Hjälmeskog, & Fjellström, 2011; Lange et al., 2014, 2016; Lindblom, 2016). When linked to the teachers' subjective choices, this could be related to their experience, attitude and knowledge, but also to frame factors such as classroom design and budget. When the students start their own households no one will be doing advance preparation for their cooking. HCS needs to become a part of the students' ordinary lives and not just be traditional HCS teaching (see Höijer, 2013; Palojoki, 1997). The students' impressions during the lessons are determined to a large degree by their everyday life outside the school (Hasselskog, 2010). Kimbell and Stables (2007) argue that students who only receive simple operation instructions will experience no need to acquire their own knowledge. According to the National Agency of Education, food safety issues should be integrated with the practical work during the lessons. If the teacher performs food safety actions before the lessons (e.g. puts out food in advance, measures the food) or after the lessons (e.g. washes dishes or cleans work surfaces) the students may fail to learn important risk-reducing steps. The teachers have to reflect on whether they want to change the way work is done in the household or just reproduce old traditions (Palojoki, 1997).

### Teaching food safety

We are constantly faced with different risks that we have to deal with, and most of them end up as just one risk among all others (Frewer, 2000; Lupton, 2000). Teachers' subjective choices of didactic content influence teaching and might reduce risk unawareness. For example, in relation to *Cooking*, different risk-related food was discussed during the interviews. The teachers' personal risk awareness might theoretically have an impact on the teaching content. If the teachers' do not perceive any risk, then they will probably not communicate any risk to the students. The teachers, therefore, need to keep up-to-date on the current issues of microbiology. When authorities such as the National Food Agency (2007) recommend not tasting raw minced meat as it could impose a risk for serious illness, especially among small children, then that should not be allowed in HCS classrooms either. Actions related to *Cleaning*, such as washing hands, wearing aprons and washing up dishes, are all examples of things that are in danger of being left as 'routine-like' actions. On the one hand, routines in teaching are valuable as they give teachers more opportunity to focus on new learning moments, but on the other hand, there is a risk that the meaning and importance of routine-like actions are not fully understood. If schools fail to reflect on their teaching and learning activities, there is a risk of stagnation (Andersson & Carlström, 2005; Emsheimer, Hansson, & Koppfeldt, 2005). Regarding the teaching of food safety issues and *Cleaning*, this could imply a risk that the teacher just becomes a role model that the students uncritically imitate (Bandura, 1977). With this kind of surface learning behaviour, the likelihood that the students will use their knowledge outside the HCS classroom is reduced. Through the use of more pluralistic and problematizing teaching and learning methods, the students will have an opportunity for deep-level learning (Kronlid, 2010). In relation to *Chilling*, a lack of awareness among teachers was noticed regarding refrigerator temperature. In order to create risk aware consumers, cold food storage needs to become an updated didactic choice of HCS teachers where they problematise and discuss within a more experimental learning situation. Experimenting would increase the quality of learning (deep level) and help the students to understand why it is so important to reduce food-related risks. Avoiding *Cross-contamination* is an essential step when minimising the risk for foodborne infection. It is also thought to be an area which needs to be highlighted in food safety education (Abbot et al., 2007; Green & Knechtges, 2015). In some HCS classrooms, coloured chopping boards are used for different food items. This is also an example of how the teachers' subjective choices could have an impact on the students' risk perception. Coloured chopping boards could work well provided that risks related to cross-contamination become a part of the teaching content and the teacher purposefully aims for a deeper understanding among the students. Otherwise, there is a risk of surface-level learning, since the link to different coloured chopping boards and the risk of cross-contamination remains unclear. In addition, their everyday experiences may interfere; outside the HCS classrooms there might only be one chopping board, or they may have other colours or be made out of wood. These three themes are examples of didactic influences for the teacher. It is, however, important to notice that they do not run parallel with each other, but instead overlap.

## Conclusion

We have shown here how HCS teachers' didactic choices in relation to food safety are affected by frames, the HCS traditional learning environment and the teachers' subjective selections of teaching content. Food safety teaching should be an essential part of HCS teaching, but there is a need for more reflective practices that would strive for a deeper learning for the students. In addition to reflection, the transferability of school-learned knowledge is of great importance that is how HCS knowledge would be best practised outside the HCS classroom. Food safety issues should become conscious didactic choices for HCS teachers in order to avoid them remaining as 'just routines'. Food safety actions such as risk reduction and risk communication need to become regular parts of HCS education.

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# Home is what you make it

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## Abstract

*This research explored a radio series,* Home Is What You Make It *(HIWYMI) on the National Broadcasting Company (NBC) during and after World War II. Beginning in spring of 1944,* HIWYMI *was a collaboration among the American Home Economics Association, the General Federation of Women's Clubs, and the National Congress of Parents and Teachers. Pioneer female broadcaster and AHEA member Jane Tiffany Wagner, Director of Women's War Activities and Director of Home Economics for NBC, produced the series.*

*A second series of weekly programs on housing, child care, food, family relations, clothing, and fashion ran from 1945 through 1948, with a total of 171 broadcasts dedicated to the American family. Its significance was reinforced when a 1949* Journal of Home Economics *fundraising appeal called on members to honour the AHEA's fortieth anniversary by promoting the theme "Home Is What You Make It."*

*A series of handbooks accompanied the HIWYMI course including Housing, Food, Clothing, Children, and the Family. In the first booklet, Dora S. Lewis, AHEA President wrote, "*Home Is What You Make It*… will suggest how, through careful management of their own resources, families can make life richer physically, emotionally, socially, and spiritually…" (Lewis, 1945, p. 5). Through primary documents including the handbooks, recordings, advertisements, and publications about the series, this article presents a successful collaborative initiative that can inform and inspire today's Home Economists.* Home Is What You Make It *was a "series of entertaining and enlightening broadcasts" which provided hope in wartime and fostered happiness for the future.*

**KEYWORDS: RADIO SERIES, 1940S, HOME ECONOMICS, USA**

## Introduction

In the Spring of 1944, the Public Service Department of the National Broadcasting Company (NBC) "recognized the need for a program of high quality specifically aimed at the homemaker… because of the disruption of American homes by war conditions" (Wagner, 1945a, p. 4). Collaborating with the American Home Economics Association, the General Federation of Women's Clubs, and the National Congress of Parents and Teachers, a radio series *Home Is What You Make It* (HIWYMI) was developed for NBC University of the Air.

The NBC University of the Air was established in 1942 to provide "systematic instruction in a carefully balanced variety of subjects" in an entertaining manner (Wagner, 1945b, p. 3). Its objective was to provide continuing education in the home. It began providing adaptations of literature in the series, *The World's Greatest Novels* in 1944. The quality of this programming was so high that some US colleges offered credit in conjunction with the broadcasts. The other series produced by the NBC

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University of the Air were: *The Story of Music*, and *Our Foreign Policy* (*The World's Greatest Novels*, 1945; *Times Past*, 2015; Wagner, 1945b).

*Home Is What You Make It* was produced by Jane Tiffany Wagner, NBC's Director of Home Economics. She was a Home Economics student at Iowa State University and Columbia University where she earned her Bachelor of Science in 1926. Wagner also studied at the Art Institute of Chicago and did postgraduate work at Simmons College in Boston. Her first position was as a Home Economics instructor in Audubon, Iowa, followed by various home services positions for Certo Corporation and the Consolidated Gas Company. Wagner is best known as a pioneer in broadcasting who served as Chairman of the Home Economists in Business section of the AHEA in 1937. She was a member of the Advertising Women's Club and the Radio Chairman for the United Council of Churchwomen for many years ("Jane Tiffany Wagner Perkins", n.d.; Laganke, 1938; "News Notes", 1938).

Like other women, Wagner was given an opportunity to advance while men were away fighting World War II, being named Director of Women's War Activities for the National Broadcasting Company (NBC) in November 1942. In this role, Jane Tiffany Wagner produced a four-week public service program called *Now Is the Time* with an all-female staff, including the first woman to ever engineer an NBC program. She sought to utilise skilled professional women where she could, but in reality Wagner's team was largely assembled from previous office assistants who she trained to write scripts as well as serve as announcers and actresses (Halper, 2001; *Home Is What You Make It*, 1945c, 1945g).

Wagner then took the role of Director of Home Economics at NBC and planned her next project for homemakers. Acting as producer, she developed this series as a public service feature. The pilot, covering "the story of the house of yesterday, today, and tomorrow" was broadcast in two segments in 1944: Wednesday, September 27th at 2:30 pm and Monday, October 16th at 1:30 pm On the first segment, actress Helen Hayes described what she and her husband looked for in a house (SONIC, n.d.).

The programs were well received, and Jane Tiffany Wagner was given the go to create *Home Is What You Make It* (HIWYMI) as a new series for NBC University of the Air. HIWYMI was a cooperative effort among the American Home Economics Association, the General Federation of Women's Clubs, and the National Congress of Parents and Teachers ("Home Is What You Make It", 1945a). Women established all three of these associations in the late 19th/early 20th century and held the majority of leadership roles.

## American Home Economics Association (AHEA)

The AHEA was founded by Ellen H. Richards in 1908 and changed its name to the American Association of Family and Consumer Sciences (AAFCS) in 1994.

> For more than 100 years, the American Association of Family and Consumer Sciences (AAFCS), founded as the American Home Economics Association, has provided leadership and support to professionals whose work assists individuals, families, and communities in making informed decisions about their well being, relationships, and resources to achieve optimal quality of life. (AAFCS, n.d., para. 1).

## General Federation of Women's Clubs (GFWC)

In 1890, Jane Croly organised 63 women's clubs throughout the United States to join together in the General Federation of Women's Clubs. The GFWC is "an organization dedicated to community improvement," and works on "important topics that impact the quality of life for all–especially those related to women and girls, early childhood education, and veterans' services" (GFWC, n.d., para. 6).

## National Congress of Parents and Teachers (PTA)

Originally founded in 1897 by Alice McLellan Birney and Phoebe Apperson Hearst as the National Congress of Mothers. This American organisation broadened its membership over the years and in 1970, merged with the National Congress of Colored Parents and Teachers (NCCPT). Now known as the Parent-Teacher Association (PTA), it works "toward bettering the lives of every child in education, health and safety" (PTA, n.d., para. 1).

## HIWYMI Program Broadcasts

*Home Is What You Make It* was scheduled on NBC Radio for Saturday mornings from 9.00am to 9.30am with the first broadcast on 18 November 1944. In January 1945, the *Journal of Home Economics* announced, "*Home Is What You Make It* is the new BIG course in home economics" (*Home*, 1945a, p. viii). The March issue asked members,

> Have you been listening to the series of Saturday morning broadcasts, "Home Is What You Make It"? If you haven't, you've been missing a good program. It's a weekly public service feature, advertised as "a course in home economics presented by the NBC University of the Air." Among the program titles are "Living Your Budget," "Good Food Pays Off," "Teen Agers Take Hold."
>
> ("Home", 1945b, p. 158).

Originally, the series was scheduled to run through April 1945. AHEA members were encouraged to make telephone calls to their local NBC radio stations, to comment on the broadcast and help to "secure an extension of it" (*Home*, 1945b, p. 158). Some of the HIWYMI programs are available through the SONIC (Sound Online Inventory Catalog) of the US Library of Congress. They include nine recordings from the first program through May 1945 as seen in Table 1.

**Table 1 Available Recordings of Home Is What You Make It**

| Broadcast Date | Topic |
|---|---|
| 11/18/1944 | The story of the White House as a home |
| 11/25/1944 | The merits of owning or renting a home |
| 12/02/1944 | Sewing, making patterns, and how to remake clothing cheaply |
| 12/16/1944 | No details |
| 12/23/1944 | Special edition: Story of the lost halo |
| 12/30/1944 | Instruction in how to make and keep a budget |
| 02/24/1945 | "You and your schools." |
| 03/17/1945 | "Victory canning." |
| 05/19/1945 | Remodelling your home. |

*Note.* (Sonic, n.d.).

## HIWYMI Program Handbooks

*Home Is What You Make It* "had wide acclaim all over the nation" (Wagner, 1945a, p. 4) and Jane Tiffany Wagner edited a series of six handbooks to accompany the series published by NBC by the International Press. Front covers prominently stated that this was a public service feature presented by NBC University of the Air. The foreword to Volume I read in part, "we hope that the material contained within its covers will help to illustrate that home is what you make it—a better place in which to live" (Wagner, 1945a, p. 4). The Volume I handbooks and authors are listed in Table 2.

**Table 2 Home Is What You Make It Handbooks—Volume I (1945).**

| Volume | Title | Author(s) |
|---|---|---|
| I | HIWYMI | Edited by Jane Tiffany Wagner, NBC Director of Home Economics |
| II | Housing | Gladys Miller, Home Furnishings Specialist |
| III | Food | May B. Van Arsdale, Professor Emeritus of Household Arts, Teachers College, Columbia University and Florence E. Clarke, Teacher of Homemaking, Department of Homemaking, Public Schools, City of New York |
| IV | Clothing | Constance Talbot, Author and Lecturer |
| V | Children | Gladys Denny Schultz, Child Authority and Author of the Better Homes and Gardens Baby Book |
| VI | The Family | Evelyn Millis Duvall, Executive Secretary, The National Conference on Family Relations |

## *Volume I—Home Is What You Make It*

The first volume, edited by Jane Tiffany Wagner, introduced the series with chapters written by "nine outstanding authorities in this field" ("Home", 1945b). The *Journal of Home Economics* reported, "All but four of its chapters were written by home economists, among them Mrs Dora S. Lewis, Eloise Davison, Grace MacLeod, and Muriel W. Brown" (*Home*, 1945b, 158). In fact, six Home Economists including Wagner contributed to this publication. Author, educator, and fashion authority, Mary Brooks Picken had been a member of AHEA since 1921 ("50-Year Membership Honor Roll", 1971). A listing of Volume I chapters with AHEA members indicated with an asterisk are seen in Table 3.

**Table 3** ***Home Is What You Make It.*** **Handbook Volume I**

| Title | Author | Author's Affiliation | Pages |
|---|---|---|---|
| Foreword | Jane Tiffany Wagner* | NBC Director of Home Economics | 4 |
| Family Relations are of First Importance | Dora S. Lewis* | President of the American Home Economics Association | 5-8 |
| Housing | Eloise Davison* | Director of the Herald-Tribune Home Institute, New York | 9-14 |
| Household Equipment and Home Safety | Editors of *Ladies' Home Journal* | From the *Wartime Homemaking Manual* | 15-20 |
| Food and Nutrition | Dr Grace MacLeod* | Professor Emeritus of Nutrition, Teachers College, Columbia University | 21-27 |
| Clothing | Mary Brooks Picken* | President of the Mary Brooks Picken Studio, New York | 28-39 |
| Problems of Family Health | Dr Ernest L. Stebbins | Commissioner of Health, City of New York | 40-45 |
| Children | Minnetta A. Hastings | President of the National Congress of Parents and Teachers | 46-50 |
| Cultural Influences in the Home | Dr Muriel W. Brown* | Consultant on Family Life Education, US Office of Education | 51-58 |
| The Community in Relation to Its Civic Interests | Mrs LaFell Dickinson | President of the General Federation of Women's Clubs | 59-64 |

*Note.* (Wagner, 1945a).

The first chapter of the handbook was written by Dora S. Lewis, President of AHEA. Lewis was included in the 1982 edition of *Home Economics Teacher Education: Seventy Significant Leaders*. She earned her BS at Washington State College in 1920 and MA degree in Home Economics at Teachers College, Columbia University in 1926. The first author of five textbooks, Lewis was Professor of Home Economics and Department Chair at both Hunter College of the City of New York and New York University (Hill, 1982). Among her many accomplishments, Dora authored a paper, *In Secondary Schools*, presented at the Sixth International Congress of the IFHE held in Copenhagen Denmark August 21—22, 1939. After her retirement in the 1950s, Dora S. Lewis was elected President of the American Federation of Soroptimist Clubs (Hill, 1982; Radcliffe, 2013).

Dora Lewis served as President of the American Home Economics Association during World War II from 1944—1946 (Baldwin, 1949; Hill, 1982). Recognising the challenges facing Home Economists in wartime, Lewis called a Wartime Meeting of Executive Board and Chairmen of National Committees in June 1945, rather than hold an AHEA annual meeting that year (Craig & Stover, 1946). In Volume I, she wrote:

> The theme *Home Is What You Make It* takes on arresting significance now that allied armies are smashing their way to certain victory, now that plans are being formulated for the better world for which those armies are fighting… *Home Is What You Make It* aims to help homemakers vision the kind of home life they may hope for after the war. It will show families where they can get help with their problems. It will suggest how, through careful management of their own resources, families can make life richer physically, emotionally, socially, and spiritually… (Lewis, 1945, p. 5).

The message and tone of the nine essays in the first handbook reflect the realities of a World War, while at the same time, position the content to provide hope and concrete guidance for the future.

## Volume II—Housing

The second volume was written by Gladys Miller, an interior designer and editor. Miller earned a BS at Oregon State College and an MA at New York University. She also studied at Moore Institute of Art, Science, and Industry. Gladys began her career at Phoenix High School and Junior College as an instructor of interior decorating, was an assistant merchandise manager for Gimbel's department store and worked in field promotion for the firm of F. Schumacher and Company. She served as decorating editor at *Mademoiselle* magazine from 1938—1942, at *Family Circle* magazine from 1946—1955, wrote weekly columns syndicated by N.A. Newspaper Alliance from 1946—1953, and published five books on interior decorating in the 1940s. Miller was the diplomatic decorator for several important historic buildings including Blair House, the official state guesthouse for the President of the United States ("Gladys Miller", n.d.).

In 1968, Miller was the third recipient of the Trailblazer Award by the International Furnishings and Design Association (IFDA). This award is "presented annually to a person who has been responsible for an innovation that meaningfully alters the way some aspect of the furnishings and design industry functions or is perceived" (IFDA, n.d., para. 1). Effie I. Raitt, Director of the School of Home Economics at the University of Washington, wrote the Preface. Gladys Miller thanked *Small Homes Guide* for allowing her to use the content of articles she had previously published in this handbook. The outline of its chapters and associated pages are seen in Table 4.

**Table 4 Home Is What You Make It—Housing. Handbook Volume II**

| | |
|---|---|
| **Part I The House** | |
| Home is a Family Affair | 8-10 |
| New Homes to Come (financing, GI Bill of Rights, planning, selecting site, heating, lighting) | 11-17 |
| The Service Rooms of the House | 18-22 |
| Built-Ins | 23-26 |
| Remodeling Old Homes | 27-28 |
| New Viewpoints for Better Living | 29 |
| **Part II Home Furnishings** | |
| Men, Don't Go Camping in Your New Home | 30-34 |
| What You Get for Your Money | 35-39 |
| Your Floor Covering Problem | 40-42 |
| That Ever Present Window Problem | 43-44 |
| Setting Your Home Background | 45-47 |
| Selecting Accessories | 48-49 |
| Your Entertaining Wardrobe | 50-54 |
| Taking Care of Your Personal Belongings | 55-57 |
| **Part III Decoration** | |
| Are You Afraid of a Well-Dressed Room? | 58-62 |
| Putting a Room Together | 63-71 |
| Are You Modern, Traditional or In Between? | 72-74 |
| Twenty Decorating Don'ts | 75 |
| Part IV Landscaping the Small Home | 76-80 |
| Bibliography | 81-82 |

*Note.* (Miller, 1945).

## Volume III—Food

With the subtitle, *Nutrition Isn't All*, Volume III of HIWYMI was written by May B. Van Arsdale, Professor Emeritus of Household Arts, Teachers College, Columbia University and Florence E. Clarke, Teacher of Homemaking, Department of Homemaking, Public Schools, City of New York. May Belle Van Arsdale was an Assistant Professor of Household Arts at Columbia University, Teachers College

when she wrote an article, *Elizabethan Hospitality* in 1916 (Van Arsdale, 1916). She produced several War Emergency Bulletins, including one on sugar-saving during World War I with her colleagues in the Department of Foods and Cookery (Department of Foods and Cookery, 1918).

May Van Arsdale was appointed to the Council on Farms and Markets the by the New York State Assembly for a ten-year term (New York, 1921). Eventually promoted to Professor at Teachers College, Van Arsdale wrote several on food, including co-authoring *Our Candy Recipes and Other Confections* with Ruth Parrish Casa-Emellos (Van Arsdale & Casa-Emellos, 1941). After the HIWYMI handbook, May and librarian, Eleanor M. Witmer, published recollections of the Teachers College at Columbia University (Witmer & Van Arsdale, 1948). Unfortunately, no additional information about Florence E. Clarke other than that attributed on the cover of *Food: Nutrition Isn't All* has been located. This volume is considerably shorter than Housing (46 pages) and does not include a bibliography. The preface to HIWYMI Volume III was written Jane Tiffany Wagner, and the outline of its chapters and associated pages are seen in Table 5.

**Table 5** **Home Is What You Make It—Food Handbook Volume III**

| Section | Pages |
|---|---|
| Nutrition Plus | 8-10 |
| Atmosphere Adds Flavor | 11-14 |
| Cookery Has a Long History | 15-19 |
| Cookery Books Have Charm | 20-23 |
| Culinary Geniuses | 24-28 |
| Religion and Food | 29-32 |
| Food in Literature | 33-36 |
| Famous Dinners | 38-42 |
| America's Heritage of Cookery | 43-46 |

*Note.* (Van Arsdale & Clarke, 1945).

## Volume IV—Clothing

Author and Lecturer, Constance Talbot was Editor of Butterick Fashions for ten years and, by 1949 had lectured on sewing to over 20 million women (Talbot, 1949). In the late 1930s, she published a bulletin on fibre identification labelling for the National Retail Dry Goods Association (Fiber Identification, 1937; Talbot, 1937). During the time when HIWYMI was broadcast, Talbot was well known for her sewing books, specifically *The Complete Book of Sewing*, which was released in 1943 with a second edition in 1949 (Talbot, 1943; Talbot 1949).

Other books by Constance included *Dressmaking and Sewing for the Home Made Easy* (1943) and *Complete Home Care of Your Family Wardrobe*. Constance Talbot's books were often reviewed in the *Journal of Home Economics* (Dietrich, 1944 Johnson, 1944). On *The Complete Book of Sewing*, Bertha F. Johnson of Utah State Agricultural College wrote:

> This book is evidence of Mrs Talbot's extensive experience in the commercial world which has given her understanding of the scope of home-makers' problems and the need for speedy and pleasurable methods for doing family sewing. It is primarily a reference book for the home-maker, but it is also suitable for the high school girl and the college freshman. (Johnson, 1944, p. 233).

The preface to HIWYMI Volume IV was written by Helen Judy Bond, Head, Department of Home Economics, Teachers College, Columbia University. The outline of its chapters and associated pages are seen in Table 6.

**Table 6** **Home Is What You Make It—Clothing. Handbook Volume IV**

| Section | Pages |
|---|---|
| Personality by the Yard | 8-12 |
| Wardrobe Planning | 13-19 |
| Preserving that Band-Box Look | 20-24 |
| Clothes and the Home | 25-31 |
| A Pocketful of Sewing | 32-39 |
| Dressing Up the Home | 40-44 |
| Bibliography | 45-47 |

*Note.* (Talbot, 1945).

## Volume V—Children

The HIWYMI handbook on children was by Gladys Denny Schultz, an author and editor. Schultz was the childcare writer for *Better Homes and Gardens* magazine from 1927 to 1945. When the handbook was written, she was a correspondent for the *Ladies Home Journal*, from 1946 to 1961 ("Schultz Obituary", 1984).

In the 1950s and early 1960s, Gladys wrote or edited several books that focused on sexuality for younger girls ("Schultz Obituary", 1984). One of them, *Courtship, Engagement and Marriage,* was reviewed by Glenn R. Hawkes of Iowa State College for the *Journal of Home Economics* (Burgess, Wallin, & Schultz, 1954; Hawkes, 1955). She also wrote biographies of Juliette Low, founder of the Girl Scout movement and the *Swedish Nightingale*, singer Jenny Lind (*Schultz Obituary*, 1984). Dora S. Lewis, President of AHEA, wrote the preface for Volume V. The outline of its chapters and associated pages are seen in Table 7.

**Table 7** **Home Is What You Make It—Children. Handbook Volume V**

| Section | Pages |
|---|---|
| Introduction | 7-8 |
| Newer Ways With Babies | 9-20 |
| Understanding the Runabout | 21-29 |
| Making School a Happy Experience | 30-37 |
| Learning to Budget | 38-42 |
| The Forgotten Age | 43-50 |
| We Were Adolescents Once | 51-56 |
| Preparing for Life | 57-61 |
| Community Influence on the Child | 62-67 |
| Bibliography | 68-72 |

*Note.* (Schultz,1945).

## Volume VI—The Family

When she wrote Volume VI, HIWYMI Evelyn Millis Duvall was Executive Secretary of the National Conference on Family Relations (NCFR). The handbook was a collaboration with her husband, Sylvanus Milne Duvall, Professor of Social Science and Religion at George Williams College. Evelyn Millis Duvall was known for her work on marriage, parenting, and family life. She graduated from Syracuse University in 1927 and earned her PhD from the University of Chicago. Evelyn worked with the Chicago Association of Child Study and Parent Education from 1934—1940, directed the Association for Family Living from 1940—1945, and was NCFR Executive Secretary from 1945—1951 (*Duvall Manuscripts*, n.d.; *Evelyn Duvall's Life*, 2008).

Duvall taught in the Sociology Department at the University of Chicago and wrote many articles and books. Her papers are in the Syracuse University Libraries Special Collections Research Center (*Duvall Manuscripts*, n.d.; *Evelyn Duvall's Life*, 2008). One of her earliest books, *When You Marry*, was first published in 1945 (Duvall & Hill, 1945). Duvall often collaborated with her husband, and later with her daughter, Joy, also a sociologist (Duvall & Duvall, 1967; *Duvall Manuscripts*, n.d.; *Evelyn Duvall's Life*, 2008). Her book, *Family Living*, was edited by Home Economist, Dora S. Lewis (Duvall, 1961). Mrs LaFell Dickinson, President, General Federation of Women's Clubs wrote the preface for Volume VI. Its chapter headings and associated pages are seen in Table 8.

**Table 8** **Home Is What You Make It—The Family. Handbook Volume VI**

| Section | Pages |
|---|---|
| Introduction. | 10 |
| What Families are For | 11-19 |
| Doing Things Together | 20-27 |
| Getting and Spending the Family Income | 28-36 |
| Conflicts Can Be Constructive | 37-44 |
| Families Alive To Religion | 45-51 |
| Bibliography | 52-56 |

*Note.* (Duvall, 1945).

## Homes Around the World—Volume II

Largely due to the support of Home Economists, thousands of copies of the HIWYMI handbooks were distributed (Wagner, 1945a). In June 1945, the JHE announced that the program was given an "extension of life" with a summer series being produced around the theme, "Homes Around the World". Members were encouraged to call their local station for the scheduled time or request that the program be carried ("Home", 1945c).

In addition to the three original sponsors: AHEA, GFWC, and PTA, *Home Around the Worl*d was "arranged in cooperation with the United Nations Information Office, New York" (Wagner, 1945b, p. 2). In the period after World War II, this series and other NBC University of the Air programs made "provision for interchange of programs with many other countries" (Wagner, 1945b, p. 3).

Jane Tiffany Wagner edited a second volume of HIWYMI to accompany the summer series, which was published by Columbia University Press. Its first printing was in July and second in September 1945 (Wagner, 1945b). In the foreword, Wagner told readers:

> It is the hope of the National Broadcasting Company through this summer series of the NBC University of the Air to bring a closer appreciation of the countries and the peoples who have worked together for victory and who must now work together for peace. Home is the common denominator from which a greater understanding among nations can grow. Let us realise how alike we are—not how different. (Wagner, 1945b, p. 3).

The contents of Home Around the World reflects a broad international representation as well as the cooperative sentiment of this initiative. The inclusion of certain nations and exclusion of others (most notably, Germany) also reveals the post World War II political climate. The handbook chapter headings, authors, affiliations, and associated pages are seen in Table 9.

**Table 9** **Home Is What You Make It—Home Around the World. Handbook Volume II**

| Title | Author | Author's Affiliation | Pages |
|---|---|---|---|
| New Zealand, The Nation With a Purpose | John S. Reid | First Secretary of the New Zealand Legation, Washington, D.C. | 5-6 |
| The Belgian Home | Henri Fast | Deputy Commissioner of Information for Belgium | 7-9 |
| The China You Don't Know | Helena Kuo | Reporter and Author of *I've Come a Long Way* | 10-12 |

| Title | Author | Author's Affiliation | Pages |
|---|---|---|---|
| Czechoslovakia: Sokol Influence on Family Life | Betka Papanek | Member of Women's Advisory Committee of the United Nations Information Office in New York | 13-15 |
| At Home in Norway | Sigrid Undset | Norwegian Novelist, Winner of Nobel Prize for Literature, 1928 | 16-17 |
| Australia, Land of Sunshine | Gavin S. Casey | Director of the Australian News and Information Bureau, New York | 18-21 |
| The French Family | Maria Jolas | Director of a Pre-War School in France; Director of *La Marseillaise* Canteen in New York | 22-23 |
| Village Life in Greece | Nicholas Lely | Director of the Greek Office of Information, New York | 24-27 |
| The Soviet Home and Family | Jessica Smith | Editor of *Soviet Russia Today* | 28-31 |
| Homes for Britain | Winifred Williams | Journalist and Author of Short Stories | 32-35 |
| Tradition in Danish Life | C. H. W. Hasselriis | Lecturer and Author, Director of Research and Information, Friends of Denmark, Inc. | 36-40 |
| Women: The Inspiration of the Polish Home | Irena Piotrowska | Art Historian and Critic, Author of Many Books on Polish Art | 41-44 |
| Home Life in Holland | Jan Greshoff | Dutch Author of Poems and Essays | 45-47 |

*Note.* (Wagner, 1945b)

## AHEA and HIWYMI

As one of the sponsors of *Home Is What You Make It*, the American Home Economics Association had a vested interest in its continuation. Promotions for the program appeared frequently in the *Journal of Home Economics*, along with instructions for members about how they could utilise radio technology in their classrooms.

> It's handled in spirited, effective style and is worth special study by anyone who is using the radio as an educational medium. It would make an excellent assignment for a teacher training class have the class listen to a broadcast, then analyse it for content and effectiveness of presentation. There's a handbook for the "course," an attractive, interesting publication edited by Miss Wagner, which you can get for 25 cents by writing to International Press, 121 Varick Street, New York 13, N. Y. ("Home", 1945b).

At the AHEA's Annual Business Meeting in September 1945, *Home Is What You Make It* was included in the Action Program.

> The AHEA can:
>
> Stimulate interest in helping young homemakers on a national scale through all possible channels.
>
> Suggest specific ways in which this help might be given at state and local levels.
>
> Publicise some of the interesting and successful projects being carried on throughout the country through a series of leaflets or journal reports or through the *Home Is What You Make It* program of the NBC or through playlets such as those of the American Theatre Wing prepared to help people understand the problems of families of returned servicemen.
>
> Assemble material for these leaflets, reports, and plays through the AHEA's division of family relations and child development, home management committee, and departments. ("Home", 1945d, p. 429).

American Home Economists sought to help families "make intelligent use of war savings," in many ways. One of the solutions was to use and publicise a leaflet prepared by the AHEA with the support of the Treasury Department and the Office of War Information. Members were encouraged to promote

the leaflet and its message by preparing "radio scripts for use of home economists on local stations", "spot announcements for use of women in charge of radio programs", and to ask the script writers of HIWYMI to "use the leaflet as theme of at least one program" (*Home*, 1945d, p. 431).

Chairman Marie Sellers included in the 1945 AHEA resolutions an expression of appreciation of "service to the American home" to the National Broadcasting Company for expanding the University of the Air to include a program on family life (*Home*, 1945d, p. 458). Reinforcing the association's commitment to Home Is What You Make It, a full-page advertisement was included in the JHE as seen in Figure 1.

JOURNAL OF HOME ECONOMICS—ADVERTISEMENTS

HOME is what you make it

A TIMELY, AUTHENTIC HOME ECONOMICS COURSE BY THE NBC UNIVERSITY OF THE AIR

**Home Is What You Make It** . . . is a series of entertaining and enlightening broadcasts . . . dramatizing the common problems of today that vitally concern all homemakers.

**Home Is What You Make It** . . . planned in co-operation with the National Congress of Parents and Teachers, The General Federation of Women's Clubs and the American Home Economics Association . . . is broadcast Saturdays 9:00-9:30 a.m. (EWT) by the National Broadcasting Company and the independent radio stations associated with the NBC Network—first program October 6.

Six handbooks are available: Vol. I—General, Vol. II—Housing, Vol. III—Food, Vol. IV—Clothing, Vol. V—Children, Vol. VI—The Family. Send 25¢ per copy to HOME IS WHAT YOU MAKE IT, NBC, 30 Rockefeller Plaza, New York 20, N. Y.

**The Home Is What You Make It** series is but one outstanding example of how the National Broadcasting Company fulfills its obligation of public service. There are many more equally significant...all help to keep NBC "*The Network Most People Listen to Most.*"

**The NBC University of the Air also offers three other important courses**

THE STORY OF MUSIC . . . . . *Thursdays, 11:30-12:00 p.m. (EWT)*
THE WORLD'S GREAT NOVELS . . *Fridays, 11:30-12:00 p.m. (EWT)*
OUR FOREIGN POLICY . . . . . *Saturdays, 7:00-7:30 p.m. (EWT)*

National Broadcasting Company

America's No. 1 Network

1945—RADIO'S 24th ANNIVERSARY—PLEDGED TO VICTORY

A Service of Radio Corporation of America

28 (In writing to advertisers, please mention the journal—it helps.)

**Figure 1** **Home Is What You Make It advertisement in *Journal of Home Economics, 37* (7) ("Home", 1945d, p. 482)**

Efforts to promote the program led NBC to launch a new series of 39 HIWYMI courses on housing, childcare, food, clothing and fashion, and family relations on October 6, 1945 ("Home", 1945e). The handbooks were reviewed in the December 1946 *Teachers College Journal* which wrote they were "designed for homemakers to aid them in creating a democratic home environment in which our future generations may develop in democratic ways" (*Home* [Book Review], 1946, p. 67). The review concluded, "Although colored by the war in progress at the time of its writing, each section is timely now" (*Home* [Book Review], 1946, p. 67).

While the programs were being broadcast, the AHEA organized committees "to develop means of guiding promising young women into the field of home economics teaching, including movie and film

strips on activities and responsibilities of a home-making teacher and a radio script on opportunities in the teaching of homemaking" (Houghton, 1946, p. 462). A questionnaire was distributed to state and city Home Economics supervisors and presidents of state home associations to determine what publications and other materials were being utilised including the radio series. Although the response rate was not reported, the JHE indicated that HIWYMI was being broadcast in nine states with four using the program in teaching (Houghton, 1946).

In addition to her work at the National Broadcasting Company, Jane Tiffany Wagner continued her service to the AHEA. She participated at a Home Economics personnel conference at Syracuse University with professionals from Nash-Kelvinator Corporation, General Foods Corporation, Macy's, the Good Housekeeping Institute, the Household Finance Corporation, the U. S. Children's Bureau, and the American Gas Association along with many university representatives. Eloise Davison of New York Herald Tribune Institute and contributor to HIWYMI Handbook I was also present ("News Notes", 1946).

By 1948, Wagner was the Assistant Manager of the Organization Division of the Public Affairs and Education Department of NBC. She was the featured speaker at the "Eye-opener" for the Annual AHEA Meeting in Minneapolis (Krost, 1948). The JHE reported that Wagner would "reveal some secrets of 'Personal Expression" as seen in Figure 2 (*In Short*, 1948, p. 202).

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**TWO OF THE SPEAKERS FOR THE AHEA ANNUAL MEETING**

**Florence Ellinwood Allen**

They will speak to the 2,000 to 3,000 home economists who attend the thirty-ninth annual meeting of the American Home Economics Association in Minneapolis, June 21 to 24.

Florence E. Allen, judge of the United States Circuit Court of Appeals for the sixth circuit (Ohio, Michigan, Kentucky, Tennessee), whose fame as a jurist is world-wide, will discuss some phase of international co-operation with reference to the home at the Wednesday evening general session, June 23.

**Jane Tiffany Wagner**

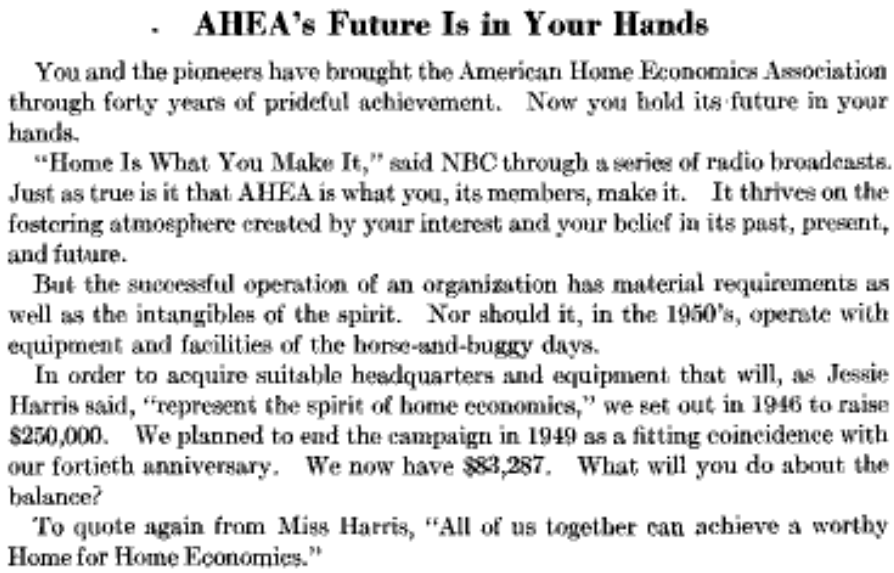
Jane Tiffany Wagner, assistant manager in the organization division of the public affairs and education department of the National Broadcasting System, who has served as a home economist for Standard Brands, Inc., Women's Service Center, Servel, Inc., Consolidated Gas Company of New York, Royal Baking Powder Company, and the Certo Corporation, will reveal some secrets of "Personal Expression" when she appears on the "Eye Opener" program Wednesday morning, June 23.

**Figure 2 Jane Tiffany Wagner in the Journal of Home Economics ("In Short", 1948, p. 202).**

Home Is What You Make It ended in February 1948 after running weekly for more than three and a half years (*Reports*, 1948; *Home*, 1948). "The 171 broadcasts dedicated to the American family enjoyed an appreciative audience" (*Reports*, 1948, p. 262). The AHEA wished success for the series' successor, *Living 1948* (*Reports*, 1948). Jane Tiffany Wagner continued to be actively involved in the American Home Economics Association. In the early 1950s, she was Vice Chairman of the AHEA public relations committee, advising the association of policies and plans for publications. Her later career included the food editor for American Home Magazine, home services director for the Gas Appliance Manufacturers, and the author of a cookbook for Consolidated Gas Company ("Jane Tiffany Wagner Perkins", n.d.).

Although the Home Is What You Make It ceased more than a year earlier, its significance was noted when the Journal of Home Economics called on members to honour forty years of the Association's

success by reinforcing the theme "Home is What You Make It" as a fundraising appeal in 1949 (*AHEA's Future Is in Your Hands*, 1949). The piece is shown in Figure 3.



## AHEA's Future Is in Your Hands

You and the pioneers have brought the American Home Economics Association through forty years of prideful achievement. Now you hold its future in your hands.

"Home Is What You Make It," said NBC through a series of radio broadcasts. Just as true is it that AHEA is what you, its members, make it. It thrives on the fostering atmosphere created by your interest and your belief in its past, present, and future.

But the successful operation of an organization has material requirements as well as the intangibles of the spirit. Nor should it, in the 1950's, operate with equipment and facilities of the horse-and-buggy days.

In order to acquire suitable headquarters and equipment that will, as Jessie Harris said, "represent the spirit of home economics," we set out in 1946 to raise $250,000. We planned to end the campaign in 1949 as a fitting coincidence with our fortieth anniversary. We now have $83,287. What will you do about the balance?

To quote again from Miss Harris, "All of us together can achieve a worthy Home for Home Economics."

**Figure 3** **AHEA Fundraising Appeal ("AHEA's Future Is in Your Hands", 1949, p. 192).**

## Conclusion

*Home Is What You Make It* provides evidence of a successful collaborative initiative that can inform and inspire today's Home Economists. Through retrieval and analysis of primary documents including the handbooks, recordings, advertisements, and articles about the series, we can uncover an innovative method that our predecessors employed in a continual effort to improve the lives of individuals, families and households.

Although the HIWYMI broadcasts and handbooks were the result of a joint sponsorship between the AHEA, GFWC, and PTA, it is obvious from examining the evidence and individual contributors, that Home Economists demonstrated leadership and put forth the majority of effort in this effective program. Through continuous promotion in the *Journal of Home Economics*, AHEA encouraged members to contact their local stations. It resulted in an initial five-month run being extended to a summer international program, and then a ten-month series. Almost two hundred half-hour segments were broadcast over three and a half years. HIWYMI began as a wartime effort, but transcended that period, proving that its message resonated with women, in both war and peace.

In addition to promoting the broadcasts, Home Economists contributed significantly to the preparation of the HIWYMI handbooks, and furthered their impact by developing new and innovative ways to utilise the handbooks coupled with technology in the classroom. They saw the potential of harnessing radio to generate excitement and interest in Home Economics among young women in the post-war period. Yet, this was not pure entertainment. The handbook content is substantial, and supported by serious professional knowledge. The *Home Is What You Make It* series provided hope in wartime and fostered happiness for the future. As stated by Jane Tiffany Wagner (1945b), "Home is what you make it anywhere in the world—a better place in which to live" (p. 3).

## Disclosure statement

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# American and South Korean family and consumer sciences secondary school programs: A cross-cultural comparison

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## Abstract

*Education and problems related to education are greatly influenced by economic, political and social factors. This cross-cultural comparison of the educational systems in the United States and South Korea shed light on how these factors influence the value placed on Family and Consumer Sciences/Home Economics curricular offerings.*

*This study is a qualitative comparison of the structure and offerings of Family and Consumer Sciences secondary programs to those in South Korea. The information was gathered through interviews and governing policies and educational mandate documents.*

*The educational systems differ in many ways; however, secondary programs in family and consumer sciences/Home Economics have a long history in both countries. In the United States, the courses and opportunities vary in state requirements. There are two types of high schools in South Korea, general and vocational. Admission to high school is dependent on the results of competitive entrance examinations. Home economics is one of the optional programs as is Art, Music, Physical Education, and Technology.*

*The subject of clothing and textiles receives major emphasis in South Korea. In the United States, due to the emphasis on societal needs along with budgetary cuts, clothing and textile programs in secondary schools are often one of the first to be cut. In South Korea, consumer education is entirely neglected throughout the four years of homemaking education; contrary, there is currently a push in the United States to mandate personal finance courses in the public schools, the catalyst being the huge consumer debt.*

*A follow-up empirical study is recommended.*

**KEYWORDS: USA, SOUTH KOREA, FCS, SECONDARY SCHOOL**

## Introduction

Probably no secondary school curriculum has had a richer history development than that of Family and Consumer Sciences. Family and Consumer Sciences as a secondary curriculum has been in existence in public schools in the United States since the mid-1800s. According to a survey conducted between 2010 and 2012, even though 50 states continue to offer family and consumer sciences courses in secondary schools, student enrollment and the number of teachers continue to decline

McCombie, S. M. & Hwang, E. J. (2017). American and South Korean family and consumer sciences secondary school programs: a cross-cultural comparison. *International Journal of Home Economics*, *10* (1).
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(Werhan, 2013). Despite the urgent need for the content that addresses our most imminent social issues; academic assessments that are used to directly indicate school success and funding dominate the educational system. The complexity and difficulties of the current system may be reduced if more cross-cultural research in family and consumer sciences/Home Economics secondary curriculum be conducted. What can we learn from our fellow professionals abroad?

## Purpose of study

This paper compares the structure and offerings of family and consumer sciences secondary programs to those in South Korea. The discipline of family and consumer sciences is known as Home Economics in South Korea. Education and problems related to education are greatly influenced by economic, political and social factors. Comparing the two educational systems will shed light on how these factors influence the value placed on family and consumer sciences curricular offerings. This study is a qualitative comparison of the structure and offerings of family and consumer sciences secondary programs to those in South Korea. The information was gathered through interviews and governing policies and educational mandate documents.

## Overview of Educational Structures

### Educational structure in the United States

Standards-based education has become a national trend. The *Goals 2000: Educate America Act* officially set educational goals and sanctioned the development of national education standards to promote learning and assess student achievement. Standards provide a guide that helps to identify the specific competencies that further define what students should know and be able to do. In 1996, President Clinton assembled governors and chief executives for a national summit on education. Corporations insisted that the country's schools were producing an ill-equipped workforce, deficient in the basic skills of reading, writing and thinking. The results of this summit produced a nation-wide push for school reform. The Federal Government's latest reform to the Elementary and Secondary Education Act, known as the *No Child Left Behind* (NCLB) *Act* of 2001 requires the creation of standards in each state for what a child should know and learn in reading and mathematics. Though states remain free to choose their own standards and tests, they must report their reading and math tests results to the United States Department of Education. Schools must track their "adequate yearly progress" (AYP) and have numerous interventions in place if they fail to make AYP.

While there is no national curriculum in the United States, the current focus is the Common Core, a set of high-quality academic standards in mathematics and English language arts/literacy (ELA). These learning goals outline what a student should know and be able to do at the end of each grade. The standards were created to ensure that all students graduate from high school with the skills and knowledge necessary to succeed in college, career, and life, regardless of where they live. Forty-three states, the District of Columbia, four territories, and the Department of Defense Education Activity (DoDEA) have voluntarily adopted and are moving forward with the Common Core.

The Common Core is informed by the highest, most effective standards from states across the United States and countries around the world. The standards define the knowledge and skills students should gain throughout their K-12 education in order to graduate high school prepared to succeed in entry-level careers, introductory academic college courses, and workforce training programs. (*About the Standards*, 2015)

The responsibility for K—12 education rests with each of the 50 the states. In the 2004—05 school year, 83 cents out of every dollar spent on education is estimated to come from the state and local levels (45.6% from state funds and 37.1% from local governments). The national government's share is 8.3%. The remaining 8.9% is from private sources, primarily for private schools. This division of support remains consistent with the nation's historic reliance on local control of schools. The national government, through the legislative process, provides assistance to the states and schools in an effort to supplement state support. The primary source of national K-12 support began in 1965 with the enactment of the Elementary and Secondary Education Act (US Department of Education).

While state requirements vary on the number of instructional days and hours in the year, the majority of states set the school year at 180 days (30 states). Eleven states set the minimum number of instructional days between 160 and 179 days, and two states set the minimum above 180 days (Kansas

and Ohio). Finally, eight states currently do not set a minimum number of instructional days. Instead, the school year in these states is measured in numbers of hours (Education Commission of the States).

**Educational Structure in South Korea**

Education in South Korea is free at the primary and middle school level, but in high school student must pay tuition. In 2004, the process of making middle school education free and required nationwide was completed (United Nations Educational Scientific and Cultural Organization-International Bureau of Education, 2010/11). In South Korea, the Constitution is the foundation of all educational laws and regulations. The general school system in South Korea comprises a 6-3-3-4-ladder pattern, which relates to elementary school, middle school, high school, junior college, college and university. Elementary education lasts six years, and once children enter elementary school, they automatically advance to the next grade each year. Upon completion of elementary school, students enter the middle school system for seventh to ninth grade, which lasts three years. The secondary education program in South Korea is divided into two systems. The six-year period of secondary education enrols students at the levels of grades 7 to 12. Secondary schools are divided into three types; (a) middle schools and high school (a general or academic high school, a vocational high school); (b) technical schools and higher technical schools; and (c) higher civic schools. Middle schools represent a dramatic change from elementary schools. Middle school students are expected, and in many cases subject to considerable pressure, to take education very seriously. There are two types of high schools in South Korea, general and vocational. Vocational schools offer specialisations in agriculture, technology, commerce, fishery, industry and Home Economics (Ministry of Education, 1988). Special high schools have also been established for science, arts, foreign languages and physical education. Admission to high school, upper secondary education, is dependent on the results of competitive entrance examinations. Each grade is separated into classes, and each class stays in their classroom as the specialist teachers move between classrooms teaching core subjects, including, English, Korean, Mathematics, as well Social Science and Pure Science. Optional programs include Art, Ethics, History, Home Economics, Music, Physical Education, Technology, and Chinese Characters. Regulations are stricter with uniforms, haircuts and punctuality. School uniforms, haircuts and attitude are usually controlled, and homeroom teachers are expected to play a key role in the students' lives. Students are allowed to wear and jewellery and/or makeup (Education System in Korea, 2015).

Responsibility for elementary and secondary education in South Korea is assigned to education boards and offices of education. There is a set national curriculum and tight administrative organisation from the Ministry down through provincial and school district authorities (Korean Ministry of Education, Science and Technology, 2015). National curricula for each school "provide the framework, within which contents are organised by the school or teacher, and criteria or the development of textbooks and instructional material" (Ministry of Education, 1991, p. 50). School curriculum content and time allocation are uniform with a few variations at the regional and local levels. These curricular are revised every seven to eight years to manage with new educational needs and social changes. Schools organise and implement their own curriculum based on the guidelines from the Metropolitan and Provincial Office of Education (MPOE) and the Local Office of Education (LOE). The school year is divided into two semesters. The first semester begins approximately in March and ends in July; the second semester begins in late August and ends in December. The number of school hours assigned for subjects, optional activities and extracurricular activities in the curriculum must be completed within at least 34 weeks in a year. An instructional hour equals 40 minutes in elementary schools, 45 minutes for middle schools, and 50 minutes for high school (Ministry of Education, Science and Technology, 2008). However, the school is entitled to adjust the duration of each instructional hour depending on the weather and seasonal changes, individual school situations, the developmental level of the students, the nature of learning, and so forth (Education system in South Korea, 2015).

The standard curriculum in the middle school established by the Ministry of Education covers nine subjects including Korean Language, Mathematics, Social Studies, Sciences, Music, Physical Education, Fine Arts, Vocational Education or Home Economics, and Foreign Language. The Standard Middle School Curriculum, vocational education for male students and Home Economics for female students afford more contact hours of instruction with students each week than other subjects. Home economics is required for all female students during each of the three years of middle school. Male students elect one vocational education subject—agriculture, industry, business, or fisheries (Education system in South Korea, 2015).

Those completing middle school may proceed to vocational high schools. These schools provide a more specialised program of vocational training. High schools are quite different than the West. High schools fall into a number of different categories, which include; public high schools, private high schools, vocational schools and speciality high schools. Public and private high schools are similar to the West; however, speciality schools are uniquely different. Speciality schools are divided into specific tracks that are geared towards a student's career path or areas they excel at. These schools are highly competitive, and entrance examinations are usually required. Speciality schools were implemented in order to help students get accepted into colleges and universities that offer similar courses and programs. Students who do not plan on attending college usually go to vocational schools, which offer specialised fields such as finance, technology, agriculture, and so on.These students usually enter the workforce right after graduation (Gone2Korea, 2014). Approximately 25 percent of middle school graduates prefer to go on to vocational schools where they are taught skills in 5 fields including Agriculture, Commerce, Fishery, Home Economics and Technology. The 1st of 3 grades follows a common program, where after students specialise (Ministry of Education, 1977).

The high school curriculum is based on a unit system. One unit is fifty-minutes of instruction per week for one semester of eighteen weeks. The curriculum is divided into four different programs according to the future plans of students and includes programs in humanities, science, vocational education, and art. A minimum curriculum for high school graduation is ninety units of required subjects and ninety units of electives. The required subjects for all students are: 24 units of Korean Language I, 4 units of Social Studies, 6 units of World History, 6 units of Korean History, 6 units of Anti-communism and Ethics, 6 units of Geography I, 8 units of Mathematics, 6 units of Biology, 18 units of Physical Education, 12 units of Military Training, 6 units of Music, 6 units of Fine Arts, 4 units of Industrial Arts, and 4 units of Technical Education.

## An overview of Family and Consumer Sciences/Home Economics school programs

### An overview of Family and Consumer Sciences school programs in the United States

In the United States, considerable changes have taken place in the family and consumer sciences secondary school curriculum since the 1980s. Many of these changes have occurred in order to respond to the current societal needs of students. Prior to these changes, typically girls were required to take Home Economics and boys took industrial arts in secondary schools. The term *Home Economics* may call up stereotypical images of girls busily sewing and cooking in 1950s classrooms, images that have led many people to view this field as fundamentally narrow, dull, and socially conservative. In the 1960s and 1970s, the women's movement was often critical of Home Economics, seeing it as a discipline that worked to restrict girls and women to traditional domestic and maternal roles.

In 1993 the new name, *Family and Consumer Sciences*, was selected at a conference held in Scottsdale, Arizona, entitled *Positioning the Profession for the 21st Century* (American Home Economics Association, 1993). The shift in emphasis has gone from technical homemaking skills, like cooking and sewing, to broader issues of family and society, for example, resource management, care for the growing elderly population, nutritional needs, and the nurturance of children (Baugher et al., 2000; Schneider, 2000). Family and consumer sciences teachers are faced with the challenge of redirecting curriculum to meet students' needs. Growing numbers of children are living in single parent or dual working families. These family structures often require children to prepare meals and/or care for younger siblings (Glick, 1992). Studies indicate that these needs are best met through content that focuses on family life education topics including family relationships, child development and parenting (Erwin, Moran, & McInnis, 1996; Schultz, 1994). Due to the emphasis on these societal needs along with budgetary cuts, sewing programs in secondary schools have been one of the first to be cut. This is counterproductive because the field of textiles and clothing offers numerous career opportunities.

The United States spends approximately $12,281 per student, and public education is free (National Center for Education Statistics). Fifty states continue to offer family and consumer sciences courses in secondary schools. The courses are either elective or required depending on each state's requirements. Students may opt to attend career technical schools (formerly called vocational) where they can specialise in family and consumer sciences content areas like culinary or child care/early childhood education. The percentage of students enrolling in college in the fall immediately following

high school completion was 66.2% in 2012 (source). Females enrolled at a higher rate (71.3%) than males (61.3%) (National Center for Education Statistics).

Professionals in the discipline of family and consumer sciences created National Standards in 1998 (V-TECS, 1998). The Family and Consumer Sciences National Standards reflect the shift in family and consumer sciences from the often negatively stereotyped technical homemaking skills to issues that are relevant to today's individuals and families (Wild, 2004; NASFACS-VTECS, 1998).

In May 2005, NASAFACS initiated a project to update the Family and Consumer Sciences National Standards. Over 1,000 reviewers, including family and consumer sciences educators and subject matter specialists from all states plus professionals in external organisations, business and industry, related agencies and other stakeholders, reviewed the National Standards and provided input for the second edition. Hence, the new *National Standards for Family and Consumer Sciences Education*, Second Edition (NASAFACS, 2008).

**An overview of Home Economics school programs in South Korea**

The vocational education for male students and Home Economics for female students have Technical Education as a common part. Four to five hours of vocational and Home Economics instruction per week in the first grade of middle school, and three hours of instruction per week in the second and the third grades are devoted to Technical Education. However, the content and the objectives of Technical Education for female students are different from the content and the objectives of Technical Education for male students (Korean Ministry of Education Science and Technology, n/a).

The objectives of Technical Education for female students are: to explore career aptitudes of the individual; to acquire basic knowledge and adaptability needed to live in an industrialized society; to develop techniques and creativity through learning experiences related to designing and assembling; and to develop a positive attitude, a sense of responsibility, and a spirit of cooperation with others through learning experiences involving making things themselves. Concepts of Technical Education for female students are primarily homemaking skills and are part of the Home Economics curriculum. Table 1 illustrates the major units of instruction in Technical Education in each grade level are as follows: (Korean Ministry of Education Science and Technology, 2015).

**Table 1 The major units of instruction in technical education in middle school**

| First Grade | Second Grade | Third Grade |
|---|---|---|
| Industrialisation and Career | Textiles, Clothing Construction and Embroidery | Textiles, Clothing Construction and Crafts |
| Textiles, Clothing Construction and Knitting | Meal Planning | Special Diet Preparation |
| Nutrition and Food Preparation | Home Gardening | Child Care |
| Housing and Drafting | Use of Household Equipment | Household Electricity |
| Machinery | | |
| Home Gardening | | |

In addition to Technical Education, the second- and third-grade female students are required to have Home Economics. The number of hours of instruction in Home Economics is 2 to 3 hours per week in the second grade (totalling 5 to 6 hours per week with three hours of Technical Education) and 2 to 9 hours per week in the third grade (totalling 5 to 12 hours per week with three hours of Technical Education). The major units of Home Economics education in each grade level are as follows: Second Grade (Clothing and Clothing Construction, Knitting and Crocheting, Meal Planning and Food Preparation, Family Health) and Third Grade (Clothing, Clothing Construction, and Dyeing; Knitting and Embroidery; Food for Special Occasions; Housing; Home Management) (Education system in South Korea, 2015).

In South Korea, the female students in humanities, in art, and in science programs are required to take ten units of Home Economics during the three-year period of high school. Also, female students in vocational education programs are required to take either 40 units of Home Economics or 10 units of Home Economics and 30 units of vocational education. Thus, the minimum number of Home

Economics units required of all female students in high school is ten, which is equivalent to 180 class periods. Home economics in high school includes instruction in the following eight areas: Clothing and Textiles; Food and Nutrition; Housing; Child Development; Family Health; Family Relations and Customs; Family Industry; Home Management (Ministry of Education, 1977).

The subject of clothing and textiles receives major emphasis in South Korea. Thirty-five percent of the specified class periods are devoted to clothing and textiles, and this is more than any other subjects. The program includes the development of skills in clothing construction at every grade level and the learning experiences. The learning experiences in clothing constructions take more than 50% of the total number of class periods specified for the subject, and embroidering and crocheting take another twenty percent, totalling more than seventy percent of the instruction in clothing and textiles. Learning experiences in skill development in South Korea start with the construction of an apron in first year homemaking including French embroidery; construction of a skirt in second-year homemaking including pattern drafting; construction of a blouse in third-year homemaking including mending and renovation of clothing and also embroidering on a pillow case and crocheting; and in fourth year homemaking, construction of slacks, construction of Korean traditional costumes, and alterations (Ministry of Education, 1977).

The curriculums of these schools are of various types, usually consisting of 30% general education and 70% vocational courses with an equal emphasis on theory and practice. In general, the first year is devoted to learning general subjects, while vocational subjects occupy greater proportions of the proceeding years. Before graduating, all students are required to complete an apprenticeship (Ministry of Education, 1977).

## Conclusion

The educational systems differ in many ways as illustrated in Table 2; however, secondary programs in family and consumer sciences (Home Economics) have a long history in both countries. In the United States, the secondary Home Economics programs have a greater variety of offerings in the curricula than the programs in South Korea. One of the major differences between the two programs is the consumer education aspect of the curricula. In South Korea, consumer education is entirely neglected throughout the four years of homemaking education, and home management is emphasised. Home management in South Korea focuses on the interrelationship of family economics with other economic systems in the society, and also on the development of family value system. Contrary, there is currently a push in the United States to mandate personal finance courses in the public schools, the catalyst being the huge consumer debt (Farzan, 2015).

**Table 2 Comparison of US and South Korean secondary schools**

| United States Secondary Schools | South Korean Secondary Schools |
|---|---|
| Discipline known as *Family and Consumer Sciences* | Discipline known as *Home Economics* |
| Spends approximately $12,281 per student (National Center for Education Statistics) | Spends approximately $9,399 per student (Chung, 2012) |
| Public Education is free for K-12 | Public Education is free for elementary school and middle school |
| Standards-based education | Standard-based education |
| Government requires testing in reading and math | Government requires taking entry exam for high school. |
| Family and consumer sciences courses offered in secondary schools in all 50 states for both males and females | Home Economic courses offered in secondary schools in South Korea for female. |
| Students may opt to go to career technical schools | Students may opt to go to career technical schools |
| National Standards exist for Family and Consumer Sciences | National Standards exist for Home Economic |
| Post-secondary education not free | Post-secondary education not free |
| Approximately 66.2% go on to post-secondary education | Approximately 70.9% go on to post-secondary education |
| No national curriculum | National curriculum framework developed by the ministry |
| Clothing and textile courses have decreased | Clothing and textile courses are a focus |
| Consumer education has become a focus | Consumer education is not in the curriculum |

The differences in objectives and philosophy and in target students lead to differences in the curricula of the secondary Home Economics programs in the two countries. In South Korea, the courses are comprehensive in all grade levels with varying depths and subjects appropriate to the maturity levels of students at each grade with an emphasis on homemaking skills. In the United States, secondary schools are either elective or required depending on each state's requirements. Students may opt to attend career technical schools (formerly called vocational) where they can specialise in family and consumer sciences content areas like culinary or child care/early childhood education. The family and consumer sciences curricula vary from state to state in both offerings of special interest courses as well as the comprehensive sequential courses. So, opportunities vary for students and are not equal from state to state. Most programs begin in junior high (typically grades 7—9) or middle school (typically grades 5—8) with very few if any K—4 (Kindergarten to 4th grade) programs.

There is a paucity of studies comparing family and consumer sciences/Home Economics secondary programs in the United States and South Korea. A follow-up empirical study would is recommended.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# The relationship between muscular activities and sensory tests when wearing jackets: Analyses by each activity of daily living

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## Abstract

*Tight-fitting jackets can cause the wearers to feel uncomfortable, in particular, if they are not used to a tight fit. This study examines people's comfort level when wearing jackets.*

*The research focuses on the comfort level of wearing jackets for some activities of daily living (ADL) by means of questionnaire surveys. Experiments to measure the muscular activities of subjects wearing jackets were also carried out by electromyogram (EMG). Wear comfort was analysed based on the results of the research and experiments. About 200 university students participated in the survey.*

*The restriction levels of the ADL were evaluated by sensory tests for 11 regions of the body using a 5-point system. Respondents felt major constrictions when they held the strap on a train or bus, crossed their hands behind their heads, or raised their hands above their heads. The EMG of the deltoid muscles and the latissimus dorsi muscles of some students recorded findings for the restriction of each ADL when wearing a jacket. In the EMG, the contractions by male students with well-developed muscular bodies were remarkable. In particular, the muscular activities of the deltoid muscles showed marked increases. The muscular activities of the deltoid muscles in female students wearing smaller-sized jackets had more significant increases than when wearing their usual size.*

*Wear comfort was analysed based on the results of the research and experiments. There was some difference in the relationship between the results of the research and experiments.*

**KEYWORDS: ACTIVITY OF DAILY LIVING, MOTION ADAPTABILITY, MUSCULAR ACTIVITY, SENSORY TEST**

## Introduction

University students regularly wear jackets when interviewing for jobs and when they practice teaching as student teachers in Japan. Since jackets are designed to fit the body, studying the aspects of wearing them can help determine if the designs are successful. For comfort, sensory evaluations have been used to examine the participants. But such evaluations are subjective and depend on participants' familiarity with wearing jackets and their physical condition, so it can be said that the

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evaluation has a relatively low aspect of being reproducible. Therefore, the sensory evaluations are to be considered in conjunction with data measured by an objective method.

There are two types of comfort discussed here: physical comfort and physiological comfort. Physiological comfort can be evaluated by measuring the temperature and humidity inside a garment and by assessing behavioural adaptability by the feel of the material. Motion adaptability can show whether a garment allows for easy movement, as an addition to subjective sensory tests. Motion adaptability is an objective evaluation method, and studies using EMG have been researched. For example, one study evaluated the fit of women's tight skirts (Inomata, Shimizu, Hino, & Kato, 1990; Inomata, Kato, & Shimizu, 1992). After that, motion adaptability evaluation has been used to measure jackets. In recent years, studies have examined the wear and operation of removable jackets, investigating the physical load and the weight of the jackets (Ishigaki & Inomata, 2006, 2007). However, research has not been conducted on jacket designs that are applicable for wear by college students who are job hunting, which is different from jackets that are said to be *recruit suits*. In this study, university students wearing jackets are evaluated through motion adaptability tests and by questionnaire to examine the participants' perceptions and actual conditions. The results of the questionnaire and the measurements of EMG were analysed. In clarifying the relationship between the analytical results of the EMG measurement results and the questionnaire, the object is to obtain suggestions for clothing designs that are suitable for motion adaptability.

## Method

### Questionnaire

The wear comfort levels in relation to the activities of daily living (ADL) for 197 university students (97 men and 100 women) were examined by sensory tests. The survey was carried out through September–October 2012 and July–September 2013. The reason for targeting college students, in terms of the human development process, is that men's muscles, especially, are at the stage in which the most growth takes place; it is a time when physical motion can be significantly restricted by the clothes people wear. Also, during teaching practice and while job hunting, male and female college students have many opportunities to experience the strong operating constraints of clothing, including jackets.

The survey questions related to subjects, jackets, and image evaluations of motion restrictions in wearing jackets.

Questions related to subjects were to determine clubs or circles that men belonged to, competition history (involving integrated exercise programs several times a week), and patterns of muscle growth. In the case of men, they were asked to describe their body type as *1. slim*, *2. slightly slim*, *3. standard*, *4. slightly muscular*, *5. athletic*, *6. slightly overweight*, or *7. overweight*. The women's categories included *1. slim*, *2. standard*, *3. slightly overweight*, *4. overweight*, and *5. muscular*.

The questions about jackets were intended to determine the places where subjects buy jackets and their awareness levels at the time of jacket purchases.

The final series of questions was to discern where a jacket felt tight in terms of location on the body, using an illustration of the jacket (identifying 16 regions, including *none*). The questions also involved 10 ADL:

1. sitting on a chair and doing paperwork
2. riding a bicycle
3. folding one's arms
4. shaking hands
5. bowing
6. holding a strap
7. walking
8. placing one's hands behind one's head
9. one's hand,
10. climbing and descending stairs.

Moreover, I asked about the level of tightness:

1. strongly tight
2. slightly tight
3. either good
4. slightly loose
5. very loose

in terms of comfort (using a 5-point Likert scale).

Note that the jackets in this research were assumed to be suit jackets that are typically worn during an entrance ceremony or while job hunting.

**Jacket wearing experiment**

The experiment consisted of a sensory test of muscle activity while participants wore jackets. Male subjects were divided according to muscle groups, including the upper limbs developed muscle group, the trunk part developed muscle group and the no muscle development group. Female subjects were divided according to jacket size, using the No. 9 size determined by Japanese Industrial Standard (JIS), or the M size, as the standard. It should be noted that in order to understand the physical characteristics of the subjects, 8 points were measured by the Martin-type human body instrument: height, posterior shoulder length, arm length, bust circumference, waist circumference, hip circumference, cervical-to-posterior waist length, and armscye circumference.

The selected piece of clothing was a formal jacket typically used in job hunting and entrance ceremonies. Four different apparel companies produced the jackets, which were selected because of their low cost and the likelihood that students would buy them. Four different sizes were chosen with the same fabric combinations (surface: 60% wool, 40% polyester; lining: 100% polyester).

Also, four shirts (55% cotton and 45% polyester) were selected along with a V-neck T-shirt that university students often use as an inner shirt (made up of 77% cotton and 23% polyester).

The women's jackets were selected from two companies. Both types of jackets have two buttons, one with sizes marked as S, M, and L and the other marked as No. 7, No. 9, and No. 11. The sizes S, M, and L are considered equal to the No. 7, 9, and 11 sizes, respectively. The jacket material composition is the same for each jacket (outer: cupra 100%; liner: 100% wool). Jackets that had not been subjected to washable processing and stretch processing were selected. Camisoles (38% polyester, 34% acrylic, 18% rayon, and 10% polyurethane) were used as underwear. Stretch fabric shirts with limited restraint were chosen.

The motions measured in this experiment related to the 10 types of ADL used in the questionnaire and the sensory test was an evaluation based on the same 5-point scale used in the questionnaire. EMG measurements were performed using Polymate Ⅱ AP216 [TEAC Corporation (Development Manufacturer: Corporation digital Tex Institute)]. The sites where the EMG measurements were performed were wiped with absorbent cotton containing alcohol to remove oil and dirt from the skin. The areas were also was coated with a paste when placing the electrode.

As the waveforms were recorded during the experiment, a *Notch*, or notch filter, was used so that the measurements were not affected by external noise. The measurement sites included the front part of the deltoid muscle (involved in the movement of the shoulder joint), the middle part, and three locations in the rear. Also, an electromyogram measured the latissimus dorsi.

Data analysis used an AP Viewer and other software (including Polymate Ⅱ) to extract the waveform data. Moreover, from the waveform data, the output from the external file (CSV file) was used to determine the first and second integral electromyogram (iEMG).

Furthermore, the obtained data were analysed as the mean EMG to eliminate influence due to the difference in duration of motion (mEMG = iEMG / operating time).

## Results and discussion

### Questionnaire

The average age of male respondents was 21.1 years old (standard deviation 1.97), and female respondents' average age was 20.1 years old (standard deviation 1.21). The average height of men was 170.0 cm, average body weight was 64.9 kg, and average body mass index (BMI) was 22.0, and the average height of women was 158.6 cm, average body weight was 50.2 kg, and average female BMI was 18.6.

When describing their own body type, 28.9% of men said they were *slightly muscular*, and 26.8% answered *standard*. Also, 19.6% of the male subjects considered themselves *athletic*. A total of 35.1% of students reported a competition history of more than 10 years, and many students said they had been involved in sports from a young age. Respondents were also asked to describe their muscle development and were separated into groups: the upper limb developed muscle group (27 patients; 27.8%), the lower limb developed muscle group (37 patients; 37.8%), the trunk part developed muscle group (27 patients; 27.8%), and the non-developed muscle group (27 persons; 27.8%). The breakdown is shown in Figure 1. For women's body types, 22.1% said they were *standard*, and 61.6% said they were *slightly overweight*. The standard value of BMI was less than 18.5 to 25.0. Since the women's average was 18.6, the subjects were closer to the lower range of the scale.

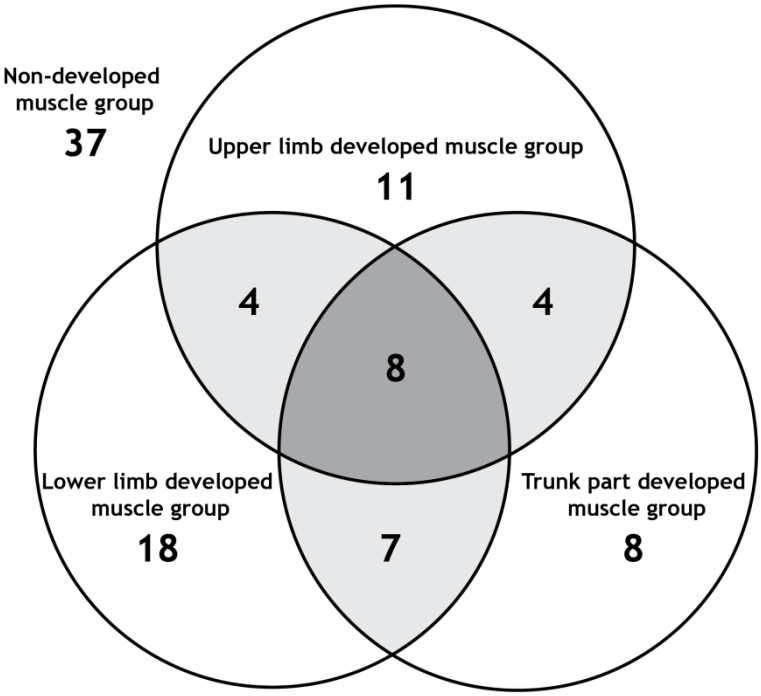


**Figure 1** **Classification by the development site of the muscles of the male respondents (number = number of people)**

In terms of where jackets were purchased, some men (15%) and women (20%) chose department stores, but most men (77%) and women (76%) shopped at speciality stores. Six men in the upper limb developed muscle group, seven men in the trunk part developed muscle group, and one woman reported that it was difficult for them to find ready-to-wear jackets that fit.

For points to be emphasised during the jacket selection, size, comfort, and design (form) were the top three items for both men and women. Price was the next consideration, followed by colour and the pattern. For men with well-developed muscles, especially in the trunk portion, comfort was particularly important in terms of selecting a jacket.

Many respondents, both men and women, expressed dissatisfaction with the functionality of jackets. Many were also dissatisfied with the price, especially men, and particularly men in the non-developed muscle group.

For the image evaluation related to the operational restrictions of the jackets, 15 items were measured: the neck, neck circumference, shoulder, upper front, front waist circumference, upper back, centre back, back waist circumference, front hip circumference, back hip circumference, near upper arm, near elbow circumference, armscye circumference, near forearm circumference, and near wrist circumference.

Of the 10 types of ADL, the results for men when holding a strap are shown in Table 1. Tightness in the shoulder was experienced by 18 men in the upper limb developed muscle group (66.7%), 18 in the lower limb developed muscle group (48.6%), 15 in the trunk part developed muscle group (55.6%), and 16 others (43.2%). In addition, the same trend was reported with the armscye and the near forearm. Also, when men hold a strap, for the average value by 5-point scale evaluation, the values were 3.59 for the upper limb developed muscle group, 3.62 for the lower limb developed muscle group, 3.63 for the trunk part developed muscle group and 3.59 for the undeveloped group. From this, regardless of the presence or absence of developed muscles, the results indicate that participants prefer a jacket that is a little loose when they are holding a strap.

**Table 1 Body regions which are felt to be tight when men wear jackets**

| | Upper limb developed muscles group | Lower limb developed muscles group | Trunk part developed muscles group | Non-developed muscles group |
|---|---|---|---|---|
| neck | 1 | 1 | 2 | 0 |
| neck circumference | 2 | 1 | 0 | 3 |
| shoulder | 18 | 18 | 15 | 16 |
| upper front | 2 | 1 | 2 | 1 |
| front waist circumference | 0 | 1 | 1 | 2 |
| upper back | 1 | 1 | 1 | 5 |
| center back | 6 | 4 | 2 | 6 |
| back waist circumference | 1 | 1 | 1 | 2 |
| front hip circumference | 0 | 0 | 0 | 0 |
| back hip circumference | 0 | 0 | 0 | 0 |
| near upper arm | 13 | 16 | 13 | 11 |
| near elbow circumference | 4 | 6 | 2 | 4 |
| armscye circumference | 15 | 11 | 9 | 12 |
| near forearm circumference | 2 | 2 | 2 | 2 |
| near wrist circumference | 2 | 2 | 0 | 1 |
| no part | 3 | 7 | 5 | 8 |

The results for women are shown in Table 2. When women were riding bicycles, holding a strap, and placing hands behind their heads, 45% reported that their armscye and near forearm were tight. When women were holding the strap and placing their hands behind their head, the result was 60%. When women were placing their hands behind their heads, 36% of the images indicated tightness (in the bust area). The average values of the 5-point scale evaluation are shown in Table 3. The values closest to 5.0 indicate a strong tendency (slightly loose). When women were riding bicycles, holding a strap, and placing hands behind their heads, the average values of armscye circumference and near forearm circumference are more than 4.0. When women were bowing, the images indicated that tightness was felt in the centre back, upper back, and back waist circumference.

From the results of the image evaluation on a 5-point scale, motions such as sitting on a chair and doing paperwork, riding a bicycle, folding one's arms, shaking hands, holding a strap, and placing one's hands behind one's head, participants felt constraint in the armscye and near forearm, most participants think it is better to have a looser-fitting jacket.

**Table 2** **Body regions where are felt to be tight when women wear jackets (image evaluation, multiple answer)(number of people,%)**

| | riding a bicycle | holding on to a strap | lacing one's hands behind one's head | bowing | climbing and descending the stairs |
|---|---|---|---|---|---|
| neck circumference | 4 (4.7%) | 7 (8.1%) | 13 (15.1%) | 10 (11.6%) | 2 (2.3%) |
| armscye circumference | 45 (52.3%) | 59 (68.6%) | 56 (65.1%) | 7 (8.1%) | 9 (10.5%) |
| near upper arm | 40 (46.5%) | 54 (62.8%) | 54 (62.8%) | 5 (5.8%) | 8 (9.3%) |
| wrist from forearm | 7 (8.1%) | 9 (10.5%) | 11 (12.8%) | 0 (0%) | 3 (3.5%) |
| upper front | 4 (4.7) | 11 (12.8%) | 31 (36.0%) | 3 (3.5%) | 5 (5.8%) |
| front waist circumference | 8 (9.3%) | 11 (12.8%) | 25 (29.1%) | 15 (17.4%) | 10 (11.6%) |
| front hip circumference | 3 (3.5%) | 11 (12.8%) | 7 (8.1%) | 6 (7.0%) | 4 (4.7%) |
| upper back | 14 (16.3%) | 16 (18.6%) | 17 (19.8%) | 27 (31.4%) | 8 (9.3%) |
| center back | 28 (32.6%) | 16 (18.6%) | 17 (19.8%) | 37 (43.0%) | 13 (15.1%) |
| back waist circumference | 9 (10.5%) | 7 (8.1%) | 6 (7.0%) | 27 (31.4%) | 7 (8.1%) |
| back hip circumference | 2 (2.3%) | 0 (0%) | 1 (1.2%) | 9 (10.5%) | 8 (9.3%) |

**Table 3** **Average rating values for the desired allowance when women are wearing jackets (using five-point Likert scale)**

| | riding a bicycle | holding on to a strap | lacing one's hands behind one's head | bowing | climbing and descending the stairs |
|---|---|---|---|---|---|
| neck circumference | 3.3 | 3.4 | 3.6 | 3.4 | 3.1 |
| armscye circumference | 4.0 | 4.3 | 4.2 | 3.2 | 3.3 |
| near upper arm | 4.0 | 4.2 | 4.2 | 3.2 | 3.3 |
| wrist from forearm | 3.5 | 3.5 | 3.6 | 3.1 | 3.1 |
| upper front | 3.5 | 3.6 | 3.9 | 3.4 | 3.2 |
| front waist circumference | 3.5 | 3.4 | 3.7 | 3.4 | 3.3 |
| front hip circumference | 3.4 | 3.3 | 3.4 | 3.4 | 3.1 |
| upper back | 3.6 | 3.6 | 3.7 | 3.8 | 3.3 |
| center back | 3.6 | 3.5 | 3.6 | 3.9 | 3.4 |
| back waist circumference | 3.4 | 3.3 | 3.3 | 3.6 | 3.2 |
| back hip circumference | 3.4 | 3.1 | 3.2 | 3.4 | 3.2 |

When the upper body tilted for actions such as bowing, many participants felt a sense of restraint in the upper back and centre back. Moreover, actions such as walking and climbing and descending the stairs, and when small movements of the upper limb were made in conjunction with operating the lower limbs, participants felt a sense of restraint across the upper extremities.

## Jacket wearing experiment

The results of the sensory test for the seven subjects in the jacket wearing experiments and the average rating values for the level of tightness are shown in Table 4.

**Table 4** **Average rating values for the desired allowance when men experimentally are wearing sample jackets (using five-point Likert scale)**

| | neck circumference | shoulder | upper back | centre back | near upper arm | armscye circumference |
|---|---|---|---|---|---|---|
| sitting on the chair and doing paperwork | 3.0 | 3.1 | 3.1 | 3.9 | 3.9 | 3.4 |
| riding a bicycle | 3.0 | 3.0 | 3.0 | 4.0 | 3.4 | 3.3 |
| folding one's arms | 3.0 | 3.3 | 3.0 | 3.4 | 3.3 | 3.1 |
| shaking hands | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.1 |
| bowing | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 |
| holding a strap | 3.0 | 3.0 | 3.0 | 3.3 | 3.9 | 3.1 |

| | neck circumference | shoulder | upper back | centre back | near upper arm | armscye circumference |
|---|---|---|---|---|---|---|
| walking | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 3.1 |
| lacing one's hands behind one's head | 3.0 | 2.9 | 3.3 | 4.3 | 4.0 | 3.6 |
| raising one's hand | 3.0 | 3.4 | 3.0 | 3.6 | 3.9 | 3.6 |
| climbing and descending the stairs | 3.0 | 3.0 | 3.0 | 3.1 | 3.0 | 3.0 |

Among the 10 kinds of activities, the motions that caused different regions of the body to feel tight were when men were sitting on the chair and doing paperwork, riding a bicycle, folding one's arms, shaking hands, holding the strap, placing one's hands behind one's head, and raising one's hand. Participants felt particular tightness in the centre back, armscye, and near forearm. All the motions (other than bowing) resulted in tightness around the upper arm (i.e., the armscye and near forearm).

In the women's experiments, they felt a sense of restraint most prominently with the motion of placing their hands behind their heads, as shown in Figure 2.

Others felt tightness in the armscye, near forearm, wrist, and centre back, especially when they wore sizes S, M, No. 7, and No 9. Compared to the image evaluation results, the questionnaire answers suggested that more participants feel a sense of restraint in their armscye and near forearm when moving the upper limbs (i.e., sitting on a chair and doing paperwork, riding a bicycle, folding one's arms, holding a strap, placing one's hands behind one's head, and raising one's hand).

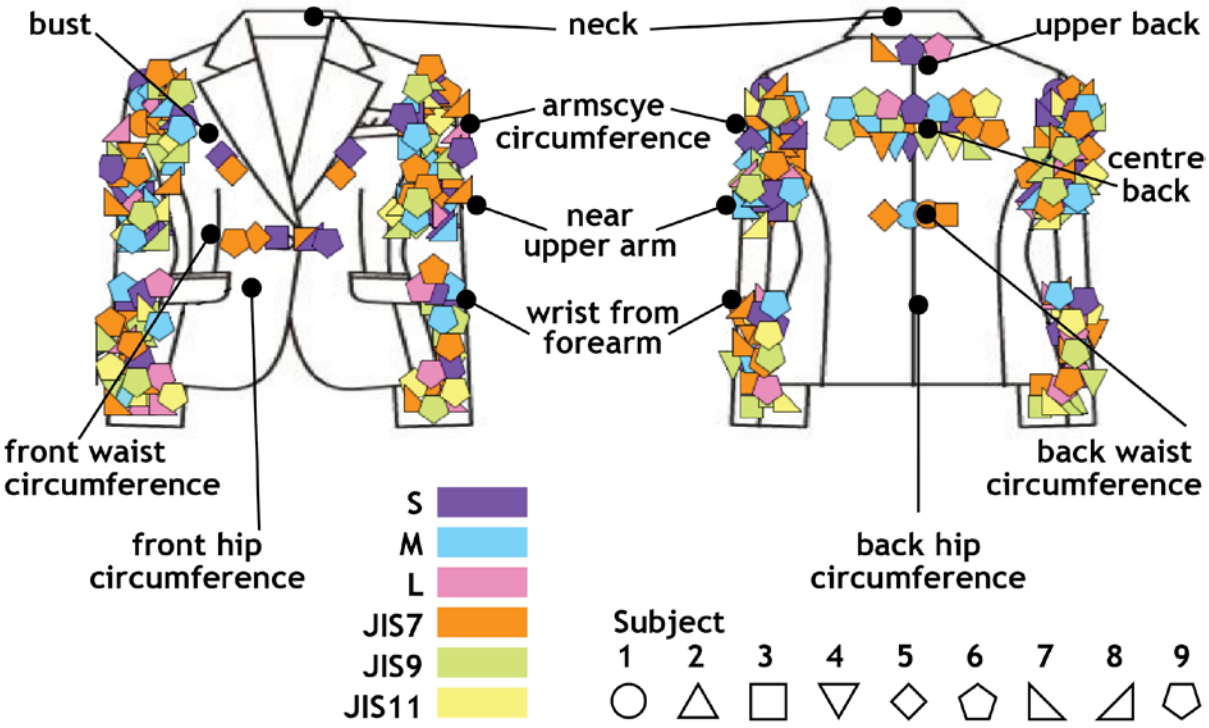


**Figure 2** **Jacket regions where are felt to be tight when women experimentally are wearing sample jackets (lacing one's hands behind one's head)**

*Note.* JIS7,JIS9,JIS11; Size determined by Japanese Industrial Standard

The results of the measurement experiment on muscle activity by EMG are explained below. An example of the EMGs of the men is shown in Figure 3.

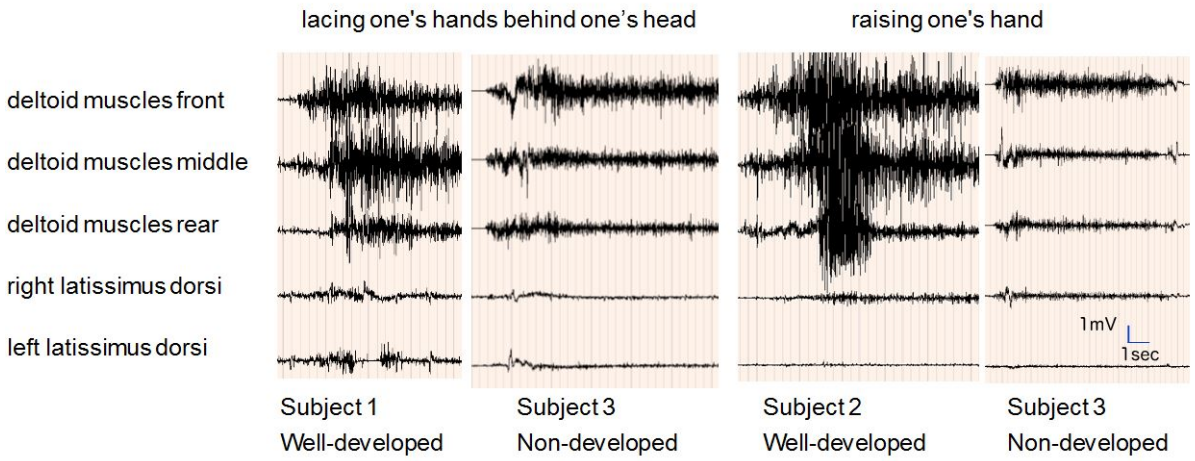


**Figure 3** **Examples of electromyogram (male subjects)**

Subject1 belongs to all the developed muscle groups (upper limbs, lower limbs, and trunk part), Subject2 belongs to the upper limb and trunk part developed group, and Subject3 belongs to the no muscles developed group. When placing one's hands behind one's head and raising one's hand, the muscle activity of the front deltoid muscles increases. With or without muscle development, the EMG values of the deltoid muscles significantly changed. Subjects 1 and 2 in the developed muscle group showed increases in deltoid muscle activity, as well as in the front, middle, and rear parts. The EMG values for the deltoid muscles also increased when holding a strap. For the motion of raising one's hand, the average EMG for the deltoid and latissimus dorsi muscles of Subject2 showed the highest value of all subjects. In the sensory test, when Subject3 in the non-developed muscle group was sitting on a chair and doing paperwork or riding a bicycle, tightness was felt in the centre back, though an increase in muscle activity was not observed.

In the questionnaire, all the developed muscle groups, many participants felt restriction and tightness near the shoulder and upper arm when holding a strap and raising one's hand. However, the results of the sensory test show that a restraining sensation is not caused around the shoulder and upper arm. In addition, when sitting on a chair and doing paperwork, riding a bicycle, holding a strap, and placing one's hands behind one's head, participants felt tightness in the centre back. There were some differences in the results from the actual wearing sensation and the wearing image.

From the results of the jacket wearing experiments with EMG, when holding the strap, placing one's hands behind one's head, and raising one's hand, it was found that the muscle activity of the deltoid muscle increased. In the jacket wearing experiments with the sensory test, tightness was felt in the centre back when sitting on a chair and doing paperwork and when riding a bicycle. Actually, it became clear that the muscle activity did not increase significantly.

The results of the EMGs for women are shown in Figure 4. The muscle activities of the deltoid muscle in the front, middle, and rear increased when holding a strap, placing one's hands behind one's head, and when raising one's hand. The EMG values for the activities involving wide movements of the upper limbs increased. In the left and right latissimus dorsi muscles, the EMG values increased when bowing and when placing one's hands behind one's head. When sitting on the chair and doing paperwork and riding a bicycle, there were some subjects that experienced significant muscle activity, while the muscle activity increased to a lesser degree in other subjects.

From the results of the human body measurements, the characteristics of Subject9 stand out. She was the largest in height and had the longest armscye circumference of all the subjects, and her bust-waist ratio was greater than the average value of the subjects. In this case, with a woman with a large bust, she felt tight in the armscye, near forearm, and upper back when folding her arms and holding a strap. When she wore the S size or the No.7 size jacket, she felt tight in the armscye, near forearm, wrist, centre back, and front waist. In the EMG results, when wearing the No.7 jacket, the muscle activity of the front, middle, and rear deltoid muscles was the largest. When wearing an S size jacket, the right and left latissimus dorsi had the largest activity.

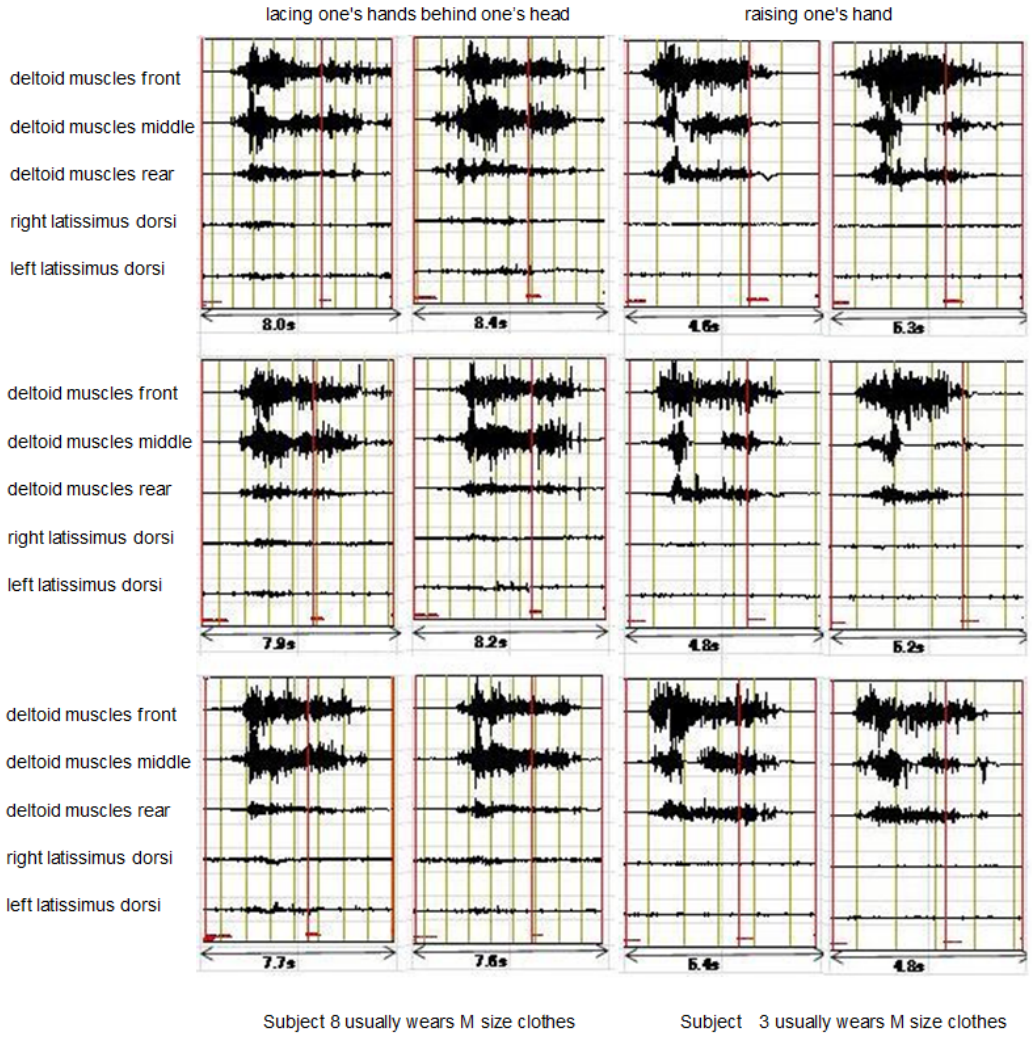


**Figure 4** **Examples of electromyograms (female subjects)**

## Conclusion

With the results from the questionnaires and the self-assessment on the developed muscles, the researcher was able to divide the participating men into the following groups: the upper limb developed muscle group, lower limb developed muscle group, trunk part developed muscle group, and non-developed muscle group.

Among the types of ADL, for both men and women, when holding the strap, placing one's hands behind one's head, and folding one's arms (specifically, moving the upper arms widely), it was determined that a sense of restraint was felt in the armscye and near forearm. This was particularly evident in men with developed muscles as opposed to those with undeveloped muscles. In the case of women's sensory test, those wearing the M size and even those wearing the S size felt a sense of restraint in the armscye and near forearm.

In the EMG measurements, an increase in the muscle activity of the deltoid muscle was seen when moving the large upper limbs in both men and women, which was a result similar to the sensory test.

However, in the case of moving the upper limbs, despite feeling a constrained feeling in the centre back in the sensory test, the increase in muscle activity the latissimus dorsi was not observed in the EMG. In this way, the sensory evaluation and EMG attest showed some differences. Also, a person's bust size can increase the muscle activity of the latissimus dorsi. Experiments on the motion of different regions of the body by sensory evaluation and EMG revealed that the physical load on the muscles depended on the regions that felt tight. Therefore, in order to reduce the tightness when wearing jackets, for the regions of the body that allow movement in the jacket, rather than

monitoring only the tightness, it was considered necessary to also examine the results from the physical load of muscle activity. When purchasing a jacket, in order to determine that the amount of movement the garment allows differs depending on the apparel manufacturer and design, we concluded that it would be effective to try the jacket on and simulate motions such as placing one's hands behind one's head and folding one's arms.

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# Nutritional anthropometry, a veritable indicator of linear growth: Case study of school age children in two local government areas of Ibadan

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## Abstract

*Nutritional anthropometry has an important advantage over other nutritional indicators because it is sensitive over a full spectrum while biochemical and clinical indicators are useful only at the extremes of malnutrition. Anthropometric measurements are inexpensive, practical, easy to use in large population-based field studies, non-invasive and age and sex-specific reference data are available. This study was carried out to evaluate the linear growth of school age children with respect to age and sex in two Local Government Areas (LGAs) of Ibadan using nutritional anthropometry as an indicator. School age children (200 males and 200 females) between the ages of 6—12 were randomly selected from ten schools in two LGAs of Ibadan using a simple sampling technique. A growth lag with variation in the basic parameters of height and weight as compared to the reference standard laid down by WHO/NCHS amongst school-age children in the areas of study was observed. In Ibadan-North LGA, the mean height of boys and girls were higher up till age 9 groups unlike that of Ido LGA which were lower in all age groups for boys and except in the age 10 group for girls. The mean weight of the boys in the two LGAs was lower while that of girls were also lower with exceptions in the ages of 7 and 8 in Ido LGA and age 8 in Ibadan-North LGA. More boys were stunted than girls in the studied areas while underweight prevalence was less in girls than boys only in Ido LGA.*

**KEYWORDS:** **NUTRITIONAL ANTHROPOMETRY, SCHOOL AGE CHILDREN, LOCAL GOVERNMENT AREAS, AGE PATTERN, SEX PATTERN**

## Introduction

Anthropometry has become a practical tool for evaluating the nutritional status of populations, particularly children in developing countries (Hakeem, Shaikh, & Asar, 2004) and nutritional status is the best indicator of the global well-being of children (de Onis, Frongillo, & Blössner, 2000). Nutritional anthropometry has an important advantage over other nutritional indicators because it is sensitive over a full spectrum while biochemical and clinical indicators are useful only at the extremes of malnutrition. In addition and more importantly, however, anthropometric measurements are inexpensive, practical, easy to use in large population-based field studies, non-invasive and age, and sex-specific reference data are available (de Onis et al., 2000; Eckhardt et al., 2003; Saksvig et al., 2005).

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In Sub-Saharan Africa, over 4% of school-age children (and in developing countries as a whole about 2%) will die before school completion. This is despite the fact that school children have the lowest annual risk of death compared to any age group. School children in developing countries are 14times more likely to die than children of the same age in industrialised countries (ACCSCN, 1990). Nigeria too is not an exception to this problem of malnutrition (Abidoye, & Ihebuzor, 2001; Odunayo & Oyewole, 2006).

The prevalence of stunting, underweight and wasting varies by region and sub region throughout low-income countries. The African region has the highest estimated prevalence of stunting (20.2—48.1%) and has the lowest rate of improvement. The severity and prevalence of stunting and underweight have been found to increase with age, with older children diverging further from the reference medians for height until puberty (see Figures 5 to 10). Previous studies in sub-Saharan Africa consistently show stunting to be higher in male than in female children (Goon et al., 2011). The evidence suggests that boys are more likely to be stunted and underweight than girls, and in some countries more likely to be wasted than girls. This may be due to bias in school population. It is also suggested that it could reflect the delayed onset of puberty (Drake, Maier, Jukes, Patrikios, & Bundy, 2002).

Most nutritional studies and interventions in Africa focus on preschool children. But what is the extent of under nutrition in school-aged children? (Lwambo, Brooker, Siza, Bundy, & Guyatt, 2000). Nutritional assessment in the community is imperative for accurate planning and implementation of intervention Programs to reduce morbidity and mortality associated with under nutrition (Oninla et al., 2006). The primary cause of ill-health and premature mortality among children in developing countries is attributed to undernutrition (Nandy, Irving, Gordon, Subramanian, & Smith, 2005). In developing country, it is postulated that poverty and ignorance are primary causal factors of malnutrition (Odunayo & Oyewole, 2006). There are several studies (Abidoye, 2000; Abidoye & Ihebuzor, 2001; Odunayo & Oyewole, 2006; Glew et al., 2003; Ekpo, Omotayo, & Dipeolu, 2008), investing the problem of undernutrition among children in different parts of Nigeria. Most previous studies are focused on children under five years, in neglect of pre-adolescent group (Goon et al., 2011).

In developing countries, most deaths in children are among the under-five children. As a result, there is extensive literature on under-five children compared to the dearth of information on the health of school children (Idowu, Sam-Wobo, Oluwol, & Adediran, 2011).

Understanding the nutritional status of school-age children has far reaching implications for promoting the health of future generations (Abidoye, 2000). The objectives of this study were, therefore, to evaluate the linear growth among school age children by age and sex using nutritional anthropometry as an indicator

## Method

### Study area

This study was carried out in two Local Government Areas (LGAs) in Ibadan. These two LGAs are a true representation of different social backgrounds. The study sites included ten randomly selected public and private schools. School-age children (200 males and 200 females) between the ages of 6—12 were randomly selected using a simple sampling technique. Details regarding the methodology of the sample selection have been reported elsewhere (Ojukwu, 2014). Consent letters which explained the objectives and procedures of the research were sent to the parents, community leaders and schools' management. Authorization to carry out the study was obtained from the honourable commissioner for education, Oyo State.

### Data Collection

A structured interviewer administered questionnaire was validated by interviewing a handful of school-age children at different locations in Ibadan using a questionnaire for five consecutive periods, when the responses given became accurate and consistent. It sought information on

1. socio-demographic background of the children which included age, sex, ethnic origin, parents marital status, religion, educational level, occupation, income, type of residence, household size and position of the child.

2. Anthropometry: Height: a portable novitose height measure (CMS weight limited, London) was used to measure all height. The height of the children was measured without shoes on a flat floor. The four contact points (i.e., occipital (head), scapula, buttocks and gastronomies (calf) were properly aligned and measured to the nearest 0.1cm. Weight: The weight of the children were taken using a portable multipurpose weighing scale (CMS weight limited). They were weighed with minimum clothing and measurement taken to the nearest 0.1kg.

**Statistical analyses**

Data obtained from anthropometry was analysed using EP1-INFO 6 software of CDC, Atlanta USA and the result was compared with those of same aged boys and girls measured by the US National Centre for Health and Statistics (NCHS) as recommended by the World Health Organization (WHO, 1986) for stunting, wasting and underweight as follows.

- Stunting: Heights-for-age at <-2.0 standard deviations (SD) of the mean values of NCHS/WHO standard. Severe stunting is defined as <-3.0 SD.

- Wasting: Weight-for-height at <-2.0 standard deviations (SD) of the mean value of NCHS/WHO standard. Severe wasting is defined as <-3.0 SD.

- Underweight: weight-for-age at <-2.0 standard deviations (SD) of mean values of NCHS/WHO standard. Severe underweight is defined as <-3.0 SD.

Means and standard deviations for weight and height were calculated across sex and age groups. The difference in the nutritional indicators, that is, stunting, underweight and wasting for boys and girls were calculated in the same vein.

Data on the socio-demographic background of the school-age children were analysed using the Statistical Package for Social Sciences (SPSS) version sixteen. The package was used for inputting and analysing the data. All statistical analyses were performed to determine the mean frequencies and relationships. Chi-square was used to test the significance of proportions, with $p < 0.05$ taken as significant.

## Results

In Ibadan-North LGA, Table 1 showed increment in the mean height of the boys from age 6 group till age 9 group and there was a fluctuation between age 10 to age 12 group. The mean height of girls increased in all the age groups. There was statistically significant difference in the mean height of boys and girls within the age groups. On comparison with NCHS/WHO standard, the mean height of the boys and girls was higher until age 9 and fluctuated between ages 10 and 12 for boys while that of girls become lower from age 10 as shown in Figure 1. In Ido Local Government Area, the table also indicated mean height increment from 111.5cm and 111.0cm for boys and girls respectively in the age 7 group to 131.0cm and 135.9cm in the age 12 group. The mean height of girls was lower than that of boys in age 7 and uniform at age 8. Thereafter, the girls were taller than the boys. There was statistically significant difference in the mean height of boys and girls within the age groups. On comparison with NCHS/WHO standard, the mean height of the girls was lower except in the age group 10 while that of the boys was lower in all age groups as shown in Figure 2.

**Table 1** **Comparison of Mean Height of Boys and Girls in Ibadan-North LGA and Ido LGA**

| | BOYS | | | | GIRLS | | | |
|---|---|---|---|---|---|---|---|---|
| **Age group (years)** | **Number examined** | **Mean ht (cms)** | **Standard deviation** | **Mean ht WHO/NCHS standards** | **Number examined** | **Mean ht (cms)** | **Standard deviation** | **Mean ht WHO/NCHS Standards** |
| **Ibadan-North LGA** | | | | | | | | |
| 6 | 4 | 109.5 | 1.73 | 108.9 | 6 | 116.3 | 3.14 | 107.9 |
| 7 | 4 | 118.0 | 5.77 | 116.1 | 15 | 119.8 | 5.18 | 115.4 |
| 8 | 17 | 127.4 | 5.27 | 122.6 | 13 | 129.3 | 3.79 | 120.6 |
| 9 | 15 | 127.7 | 6.37 | 128.1 | 12 | 129.7 | 10.58 | 127.4 |
| 10 | 22 | 127.4 | 5.89 | 131.6 | 27 | 133.1 | 7.85 | 133.2 |
| 11 | 23 | 138.8 | 9.11 | 138.1 | 19 | 135.5 | 7.88 | 138.5 |
| 12 | 15 | 137.5 | 6.62 | 143.4 | 8 | 142.4 | 6.41 | 144.0 |
| **Ido LGA** | | | | | | | | |
| 7 | 4 | 111.5 | 0.58 | 116.1 | 6 | 111.0 | 0.89 | 115.4 |
| 8 | 6 | 118.0 | 2.37 | 122.6 | 8 | 118.0 | 3.55 | 120.6 |
| 9 | 22 | 121.8 | 4.93 | 128.1 | 13 | 127.0 | 5.48 | 127.4 |
| 10 | 26 | 126.5 | 4.69 | 131.6 | 28 | 211.0 | 4.49 | 133.2 |
| 11 | 14 | 128.0 | 4.23 | 138.1 | 18 | 130.0 | 6.66 | 138.5 |
| 12 | 28 | 131.0 | 6.76 | 143.4 | 27 | 135.9 | 5.96 | 144.0 |

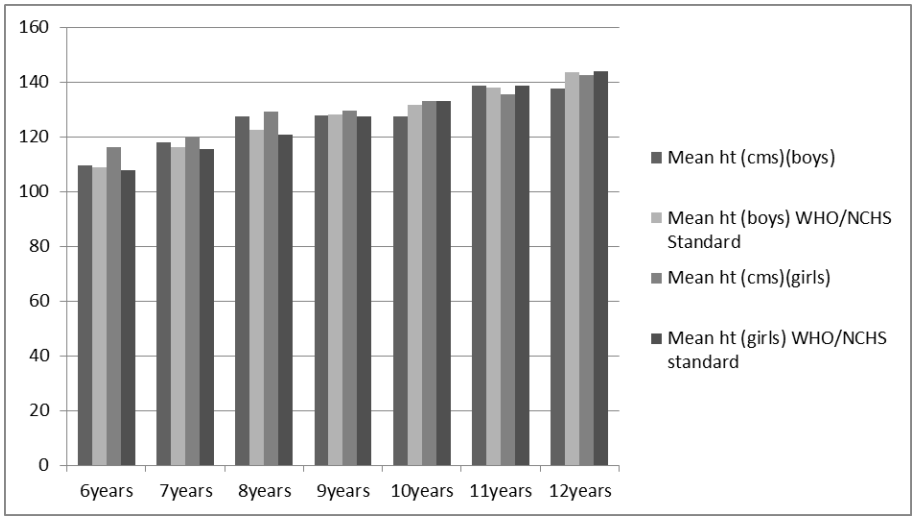


**Figure 1** **Component bar chart showing comparison of mean height (cms) of boys and girls in Ibadan-North LGA**

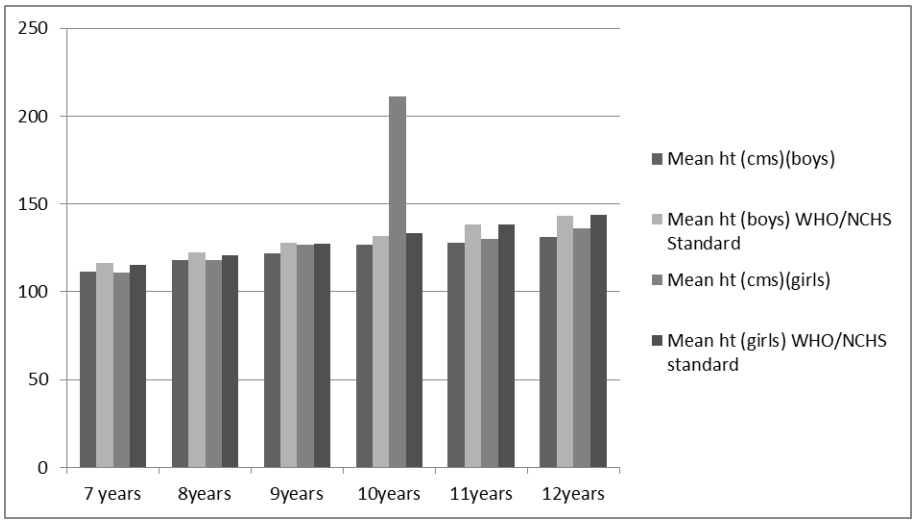


**Figure 2** **Component bar chart showing comparison of mean height (cms) of boys and girls in Ido LGA**

Table 2 showed that in Ibadan LGA, mean weight of boys increased from 17.0kg in the age 6 group to 28.5kg in the age 11 group and decreased to 28.3kg in the age 12 group while that of girls increased from 18.0kg to 23.6kg from age 6 group to 23.6kg in the age 8 group and went down to 22.8kg in the age 9 group. There was statistically significant difference in the mean weight of boys and girls within the age groups. On comparison with NCHS/WHO standard, the mean weight of boys was lower in all the age group while that the girls was in the ages 6 and 7 groups, higher in the age 8 group and become lower thereafter as shown in Figure 2. The table also indicated that in Ido LGA (see Figure 4), the mean weight of boys and girls increased from 20.5kg and 21.2kg for age 7 groups to 26.1kg and 27.7kg for age 12 groups. The mean weight of boys was less than girls in all the age group except for age 10. There was statistically significant difference in the mean weight of boys and girls within the age groups. On comparison with NCHS/WHO standard, the mean weight of the boys was lower in all age group while the mean weight of the girls was lower than the standard except for ages 7 and 8 as shown in Figure 3.

**Table 2 Comparison of Mean Weight of Boys and Girls in Ibadan-North LGA and Ido LGA**

| | Boys | | | | Girls | | | |
|---|---|---|---|---|---|---|---|---|
| Age group (years) | Number examined | Mean wt (kg) | Standard deviation | Mean wt (boys) WHO/NCH standards | Number examined | Mean wt (kg) | Standard deviation | Mean wt (girls) WHO/NCHS Standards |
| **Ibadan-North LGA** | | | | | | | | |
| 6 | 4 | 17.0 | 0.00 | 18.6 | 6 | 18.0 | 00.0 | 18.1 |
| 7 | 4 | 20.5 | 1.73 | 21.3 | 15 | 20.9 | 1.51 | 21.0 |
| 8 | 17 | 23.1 | 2.59 | 24.0 | 13 | 23.6 | 3.10 | 22.2 |
| 9 | 15 | 21.7 | 1.79 | 26.4 | 12 | 22.8 | 3.42 | 26.3 |
| 10 | 22 | 24.2 | 3.39 | 28.8 | 27 | 24.1 | 3.72 | 30.8 |
| 11 | 23 | 28.5 | 5.39 | 33.6 | 19 | 26.0 | 3.10 | 32..6 |
| 12 | 15 | 28.3 | 1.71 | 36.9 | 8 | 31.0 | 3.78 | 37.6 |
| **Ido LGA** | | | | | | | | |
| 7 | 4 | 20.5 | 2.89 | 21.3 | 6 | 21.2 | 2.30 | 21.0 |
| 8 | 6 | 21.8 | 2.48 | 24.0 | 8 | 23.5 | 0.93 | 22.2 |
| 9 | 22 | 23.6 | 1.62 | 26.4 | 13 | 24.9 | 1.85 | 26.3 |
| 10 | 26 | 26.8 | 3.60 | 28.8 | 28 | 25.2 | 2.83 | 30.8 |
| 11 | 14 | 26.9 | 2.32 | 33.6 | 18 | 27.7 | 4.63 | 32.6 |
| 12 | 28 | 26.1 | 2.42 | 36.9 | 27 | 27.7 | 2.13 | 37.6 |

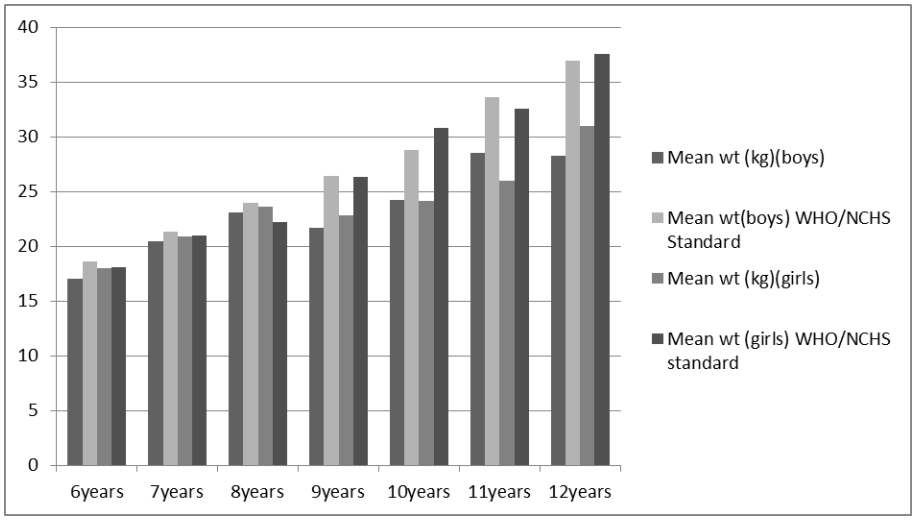


**Figure 3 Component bar chart showing comparison of mean weight (kg) of boys and girls in Ibadan-North LGA**

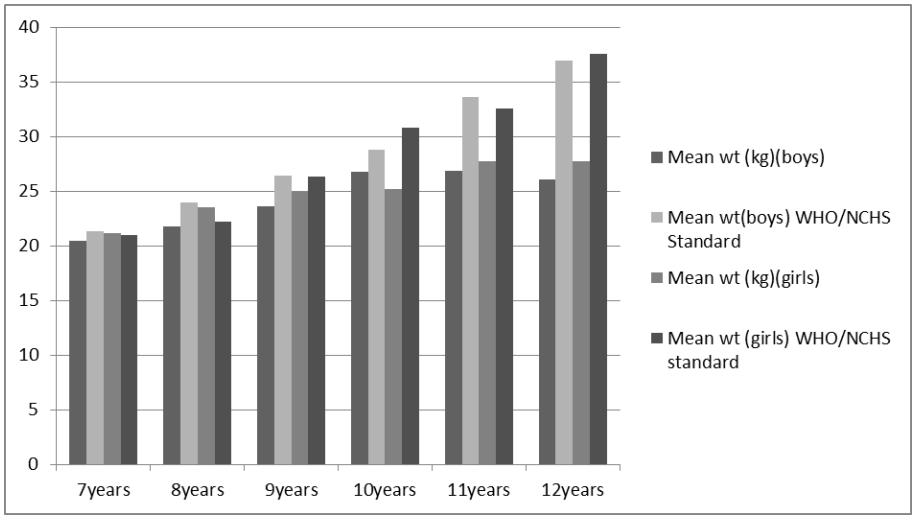


**Figure 4** **Component bar chart showing comparison of mean weight (kg) of boys and girls in Ido LGA**

Table 3 showed that in Ibadan-North LGA, stunting prevalence increased from age 7 to age 10 and dropped between ages 11 and 12. Prevalence of underweight increased from ages 9 to 10 and decreased between ages 11 to 12 while wasting prevalence although very low cut across all ages except age 12. However, this difference was only statistically significant ($p < 0.05$) for underweight as shown in Figures 5, 6 and 7 respectively. Table 3 also indicated that in Ido LGA, stunting prevalence was low in ages 7 and 8 while it increased from ages 9 to 12 progressively. Prevalence of underweight increased from 0.5% at age 9 to 12.5% at age 12. Wasting prevalence was identified with age 10 only (0.5%). The age difference was statistically significant ($p < 0.05$) for stunting and underweight as shown in Figures 8, 9 and 10 respectively.

**Table 3** **Prevalence of stunting, underweight and wasting among school-age children according to age in Ibadan-North LGA and Ido LGA**

| | **Stunting** | | | | **Underweight** | | | | **Wasting** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **(Years)** | Normal | | Stunted | | Normal | | Underweight | | Normal | | Wasted | |
| **Age** | **N** | **(%)** | **N** | **(%)** | **N** | **(%)** | **N** | **(%)** | **N** | **(%)** | **N** | **(%)** |
| Ibadan-North LGA | | | | | | | | | | | | |
| 6 | 10 | 5.0 | - | - | 10 | 5.0 | - | - | 11 | 5.5 | 1 | 0.5 |
| 7 | 16 | 8.0 | 3 | 1.5 | 19 | 9.5 | - | - | 20 | 10.0 | 1 | 0.5 |
| 8 | 28 | 14.0 | - | - | 30 | 15.0 | - | - | 27 | 13.5 | 3 | 1.5 |
| 9 | 21 | 10.5 | 6 | 3.0 | 23 | 11.5 | 4 | 2.0 | 26 | 13.0 | 2 | 1.0 |
| 10 | 35 | 17.5 | 14 | 7.0 | 35 | 17.5 | 14 | 7.0 | 38 | 19.0 | 3 | 1.5 |
| 11 | 33 | 16.5 | 9 | 4.5 | 31 | 15.5 | 11 | 5.5 | 40 | 20.0 | 2 | 1.0 |
| 12 | 16 | 8.0 | 9 | 4.5 | 19 | 9.5 | 4 | 2.0 | 26 | 13.0 | - | - |
| TOTAL | 159 | 79.5 | 41 | 20.5 | 167 | 83.5 | 33 | 16.5 | 188 | 94.0 | 12 | 6.0 |
| Ido LGA | | | | | | | | | | | | |
| 7 | 8 | 4.0 | 2 | 1.0 | 10 | 5.0 | - | - | 10 | 5.0 | - | - |
| 8 | 12 | 6.0 | 2 | 1.0 | 14 | 7.0 | - | - | 14 | 7.0 | - | - |
| 9 | 21 | 10.5 | 14 | 7.0 | 34 | 17.0 | 1 | 0.5 | 35 | 17.5 | - | - |
| 10 | 38 | 19.0 | 16 | 8.0 | 50 | 25.0 | 4 | 2.0 | 53 | 26.5 | 1 | 0.5 |
| 11 | 11 | 5.5 | 21 | 10.5 | 27 | 13.5 | 5 | 2.5 | 32 | 16.0 | - | - |
| 12 | 12 | 6.0 | 43 | 21.5 | 30 | 15.0 | 25 | 12.5 | 55 | 27.5 | - | - |
| **TOTAL** | **102** | **51.0** | **98** | **49.0** | **165** | **82.5** | **35** | **17.5** | **199** | **99.5** | **1** | **0.5** |

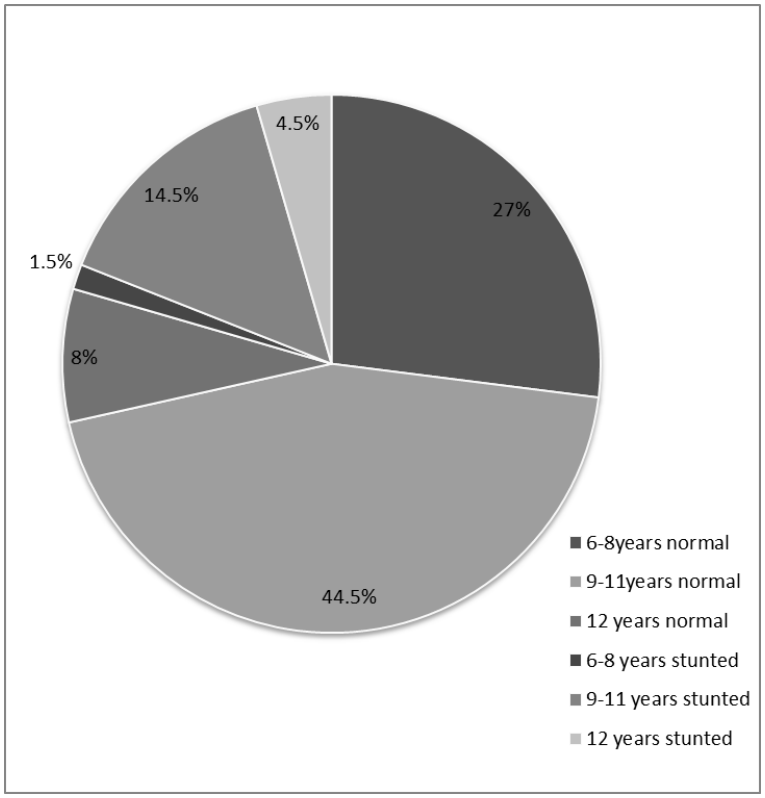


**Figure 5** **Pie chart diagram of prevalence of stunting according to age (years) in Ibadan-North LGA**

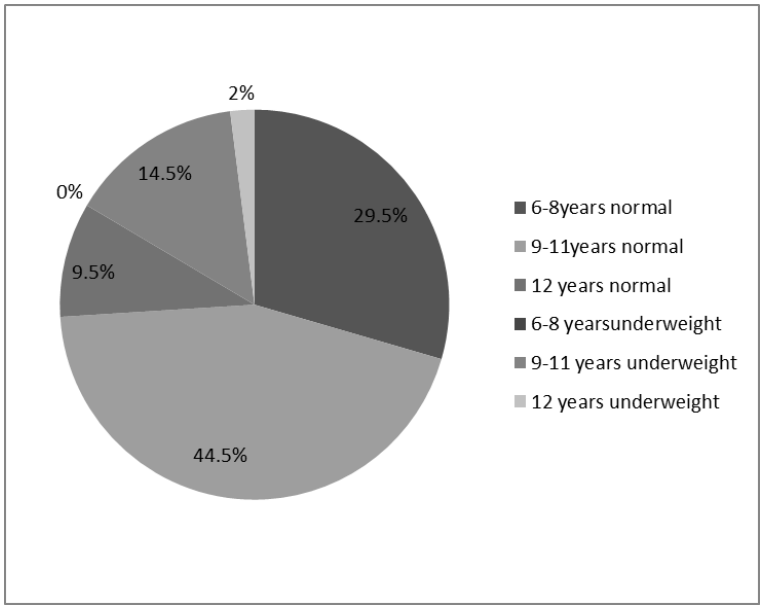


**Figure 6** **Pie chart diagram of prevalence of underweight according to age (years) in Ibadan-North LGA**

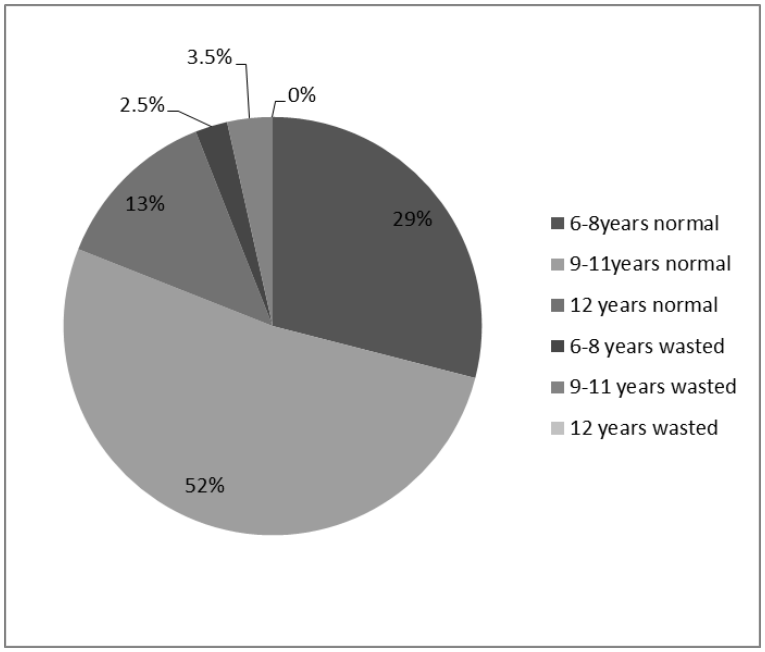


**Figure 7** **Pie chart diagram of prevalence of wasting according to age (years) in Ibadan-North LGA**

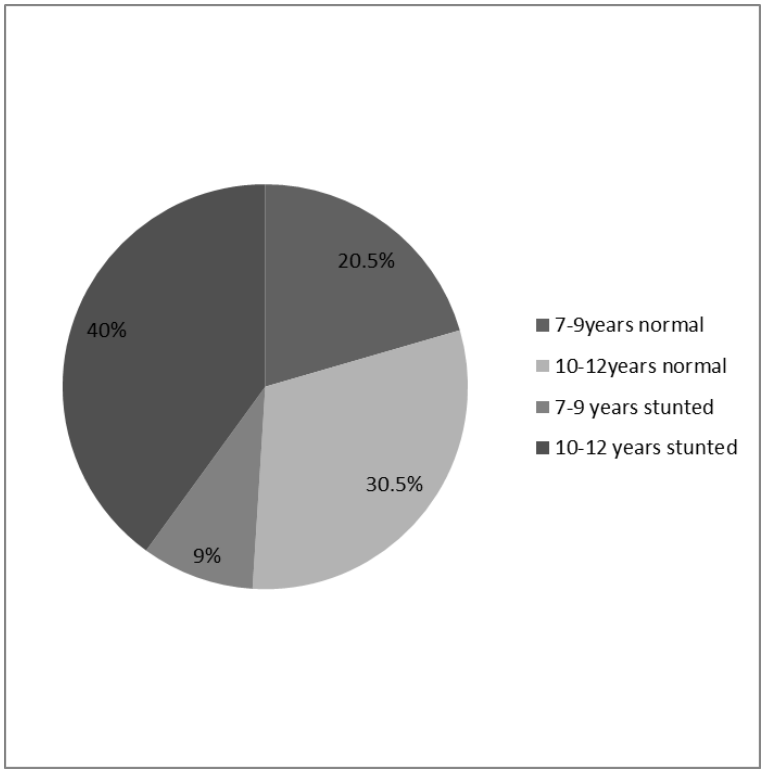


**Figure 8** **Pie chart diagram of prevalence of stunting according to age (years) in Ido LGA**

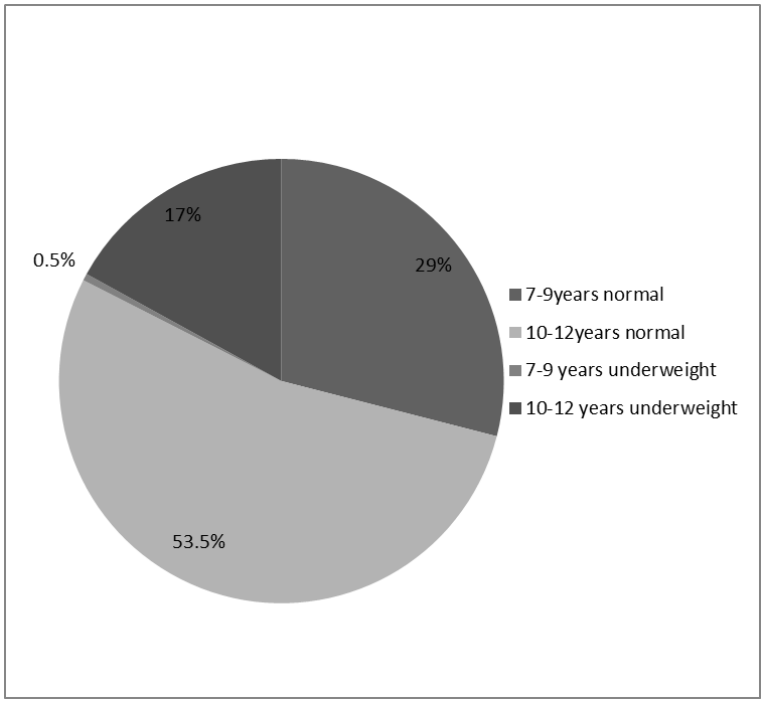


**Figure 9** **Pie chart diagram of prevalence of underweight according to age (years) in Ido LGA.**

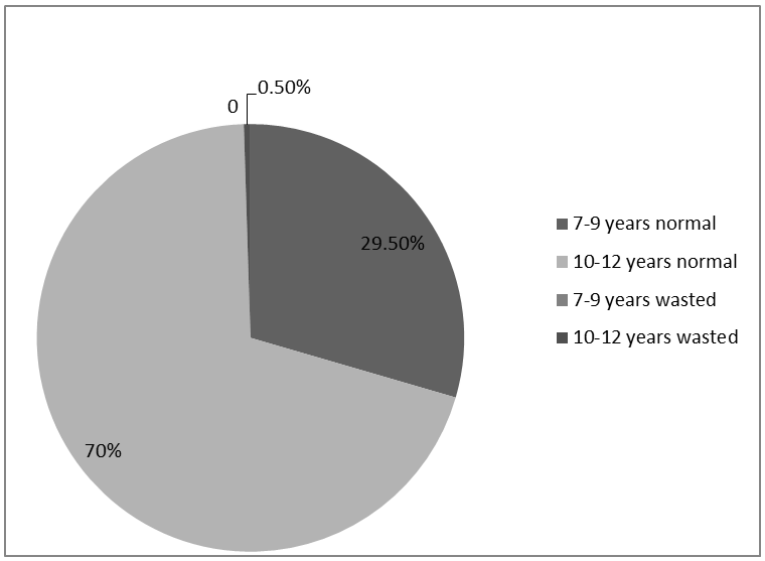


**Figure 10** **Pie chart diagram of prevalence of wasting according to age (years) in Ido LGA**

Table 4 showed that in Ibadan-North LGA, stunting prevalence was higher among males (13%) than in females (7.5%) while underweight and wasting prevalence between boys and girls were almost the same. This difference was not statistically significant for any of the three nutritional indices namely stunting, wasting and underweight. The table also indicated that in Ido LGA, prevalence of stunting and underweight were higher in males than females. About 29.5% male and 19.5% females were stunted while 11% males and 6.5% females were underweight. Prevalence of wasting was low in females (0.5%) and none in males. Statistically, this difference was significant for stunting only.

**Table 4** **Prevalence of Stunting, Underweight and Wasting with respect to Sex among school-age Children in Ibadan-North LGA and Ido LGA**

| | Stunting | | | | Underweight | | | | Wasting | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Normal | | Stunted | | Normal | | Underweight | | Normal | | Wasted | |
| **Sex** | **N** | **(%)** | **N** | **(%)** | **N** | **(%)** | **N** | **(%)** | **N** | **(%)** | **N** | **(%)** |
| **Ibadan** | | | | | | | | | | | | |
| **North LGA** | | | | | | | | | | | | |
| Male | 74 | 37.0 | 26 | 13.0 | 83 | 41.5 | 17 | 8.5 | 93 | 46.5 | 7 | 3.5 |
| Female | 85 | 42.5 | 15 | 7.5 | 84 | 42.0 | 16 | 8.0 | 95 | 47.5 | 5 | 2.5 |
| Total | 159 | 79.5 | 41 | 20.5 | 167 | 83.5 | 33 | 16.5 | 188 | 94.0 | 12 | 6.0 |
| **Ido LGA** | | | | | | | | | | | | |
| Male | 14 | 20.5 | 59 | 29.5 | 78 | 39.0 | 22 | 11.0 | 100 | 50.0 | - | - |
| Female | 61 | 30.5 | 39 | 19.5 | 86 | 43.5 | 13 | 6.5 | 99 | 49.5 | 1 | 0.5 |
| Total | 75 | 51.0 | 98 | 49.0 | 164 | 82.5 | 35 | 17.5 | 199 | 99.5 | 1 | 0.5 |

## Discussion

This study showed a growth lag with variation in the basic parameters of height and weight as compared to the reference standards laid down by NCHS/WHO amongst school–age children in the areas of study. Although the NCHS standard used in this study represents the growth pattern of children from the USA, it is accepted internationally to adequately reflect variation in growth that is related to nutrition and health of children from different ethnic backgrounds (de Onis & Habicht, 1996). The new multi-centre growth reference chart of the World Health Organisation (WHO) was not used because there are very few studies that used it on school children and adolescents, and this will make it difficult for us to compare our findings with those of many other studies that used the NCHS. Moreover, Stephenson et al., shows that the height of well-off, urban school children in Kenya was not different from the NCHS reference values (Partnership for Child Development, 1998) while Janes, Macfarlane, & Moody (1981) found that the growth of 'elite' Nigerian children is similar to the figures of the NCHS. The increment which existed in the mean height of boys and girls in Ibadan-North Local Government Area up till age 9 unlike their Ido counterpart could be a reflection of the high socio-economic status of their parents and hence good food intake by the pupils (Olusoga, Abisola, & Oluwakemi, 2008). The mean weight of the boys in the two LGAs are in agreement with the report by Mukherjee, Chaturvedi, & Bhalwar (2007), Agarwal et al. (1992), Bhasin Singh, Kapil, Sood, & Gaur (1990), Panda, Benjamin, Singh, & Zachariah (2000), and Banerjee (2001). Underweight is used as a composite indicator to reflect both acute and chronic undernutrition, although it cannot distinguish between them (Bose, Bisai, Chakraborty, Datta, & Banerjee, 2008). The relationship between stunting and gender varied. While some study demonstrated a higher prevalence among males,(Mukudi, 2003; Onila et al., 2006; Gür et al., 2006) others demonstrated a higher prevalence among female (Chowdhury, Chakraborty, & Ghosh, 2008; Ukoli, Adams-Campbell, Ononu, Nwankwo, & Chanetsa, 1993). This difference is likely to stem from differential nutritional intake, socio-economic and cultural differences rather than a difference in their genetic potential to achieve maximum height (Senbanjo, Oshikoya, Odusanya, & Njokanma, 2011).

The study also showed that more males were stunted than females in Ibadan—North LGA while in Ido LGA, more males were stunted and underweight than females. Goon et al., 2011 also in his work, found that boys were more underweight (48.8%) compared to girls (38.5%) similarly to other studies among Nigerian children. Similar results were reported from studies in other countries (Bener, 2006). It is difficult to explain the variation in the level of underweight and stunting between boys and girls observed in this study especially as either of the malnutrition cuts across the two studies areas. Whether both sexes are subjected to different conditions of health and dietary lifestyle is only speculative as this study does not assess that.

These findings are in line with the report of Shahabuddin et al. (2000) which found that boys are more likely to be stunted and underweight than girls in some countries. This, he said, might have been due to bias in the school population. (Lwambo et al., 2000) also reported that there are

important differences in stunting and anaemia between boys and girls in a cross-sectional study carried out among Tanzanian school children.

## Conclusion and recommendation

Problems of stunting and underweight among the school age children can be addressed by understanding more fully the patterns and causes of under-nutrition for boys and girls at different ages (Lwambo et al., 2000). Nutritional intervention Program such as the Family Support Program (FSP), School Meal Program (SMP) and Women Empowerment Program (WEP) should be resuscitated and sustained towards improving the nutritional status of school-age children.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# Home food preparation and diet in adolescents

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## Abstract

*Background: A high-quality diet is important for maintaining lifelong health. Current dietary patterns among adolescents reveal a low intake of vegetables and fish and a high intake of energy dense foods. Moreover, few studies have explored whether home food preparation by parents leads to increased intake of healthy food by adolescents.*

*Objective: This study aimed to examine associations between the extent of home food preparation reported by parents and dietary habits of Norwegian adolescents.*

*Design: In 2012, a cross-sectional study was conducted in nine lower secondary schools in Vest-Agder County, Norway. Parents' perceptions of the extent to which they prepared food themselves were assessed through an online questionnaire, while adolescents also completed an online food frequency questionnaire on their dietary habits at school. Out of a total of 742 ninth-grade students invited to participate in the study, 517 students (mean age of 13.9 years) accepted, resulting in a participation rate of 69.7%. The total number of dyads of parents and students contributing information was 308 (41.5%).*

*Results: There was a crude positive association between the extent of food preparation reported by parents and vegetable (B: 0.27, 95 CI: 0.23, 1.70) as well as total fruit and vegetable consumption among adolescents (B: 0.45, 95 CI: 0.11, 0.78). This also applied after adjusting for sex and parental education. Indicating that the higher parental perception of home food cooking, the higher intake of fruits and vegetables. There were no significant associations between food preparation by parents and consumption of either fish or fast food.*

*Conclusions: Food preparation at home, reported by parents, was positively associated with total fruit and vegetable intake by adolescents. However, intervention studies are necessary to ascertain whether a causal relationship exists between home cooking and vegetable intake among adolescents.*

**KEYWORDS: DIET, HOME FOOD COOKING; FRUITS AND VEGETABLES, ADOLESCENTS**

## Introduction

Low-quality diets are associated with higher risks for developing chronic diseases, obesity, and certain cancers (Lim et al., 2013). During childhood and adolescence, a high-quality diet is especially important as these are the years of the greatest growth and development. Moreover, lifestyle habits cultivated during adolescence continue into adulthood (Lake, Adamson, Craigie, Rugg-Gunn, & Mathers, 2009). Some studies have also linked a healthy diet to better learning (Florence, Asbridge,

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& Veugelers, 2008), further emphasising the importance of good food quality during childhood and adolescence. In recent decades, there has been an intergenerational shift in what we eat which can be partially attributed to the increasing consumption of food outside of the home (Lachat et al., 2012). Numerous studies have reported that eating outside of the home is associated with high energy intake, poor dietary quality, high intake of highly processed foods, and weight gain (Lachat et al., 2012).

In light of this knowledge, we could assume that eating food prepared at home would improve diet quality by reducing the intake of energy dense and highly processed food. In the UK, one of the most important health-promoting messages relating to obesity concerns home food preparation (Mills et al., 2015). However, few studies have been conducted on the effects of home food preparation (Mills et al., 2015). Moreover, a recent review concluded that the importance of home cooking, could not be evaluated because of a lack of studies in this area (Reicks, Trofholz, Stang, & Laska, 2014).

Studies conducted among adults have shown that the diets of young adults who regularly prepare food at home are more in alignment with dietary recommendations compared with those who do not prepare food at home (Larson, Perry, Story, & Neumark-Sztainer, 2006). Studies have further shown that children and adolescents who are involved in the cooking of meals have healthier diets (Laska, Larson, Neumark-Sztainer, & Story, 2012; Chu, Storey, & Veugelers, 2014).

In Norway, there is no data available on the frequency of home food preparation. A large American study indicates that 8% of Americans never cook and 43% only cook sometimes (Virudachalam, Long, Harhay, Polsky, & Feudtner, 2014). In households with dependents, dinners are cooked more often than they are in households without dependents (Virudachalam et al., 2014). Even though there are no national statistics relating to the frequency of home cooking in Norway, studies of parents of young children in the country show that 43% would like to learn more about how to prepare food for their children (Øverby, Kristiansen, Andersen, & Lande, 2008).

To the best of our knowledge, there have been no Nordic studies, to date, on associations between any measures of food preparation by parents and the dietary intake of children or adolescents. Studies have found that Norwegian adolescents have a low intake of vegetables and fish and a high intake of sugary drinks (Øverby, Lillegaard, Johansson, & Andersen, 2004; Øverby & Andersen, 2002). Therefore, a hypothesis of this study was that if parents report to agree of a high frequency of meal preparation, the intake of vegetables and fish would increase and possibly lead to a reduced intake of fast food. The aim of this study was thus to explore associations between practices of home food cooking and the dietary habits of Norwegian adolescents.

## Methods

### Study design, procedure, and sample

A cross-sectional study of ninth grade students (13–14 years old) from lower secondary schools in Vest-Agder County, Norway, was conducted from September to November in 2012. All of the secondary schools (grades 8–10) located within five communities in this county were invited to participate in the study. Of the 15 schools invited, 9 (60%) agreed to participate in the study. A total of 742 children were invited to participate. Information about the study was disseminated through two information channels. These, comprised information provided orally to the students at each school and two letters with information about the study handed over to the students (one for the student and one for the student's parents) (Skårdal, Western, Ask, & Øverby, 2014). Parents gave their written consent for their children's participation on the project's website. In total, 531 students were given permission to participate. Of these, 517 completed the food frequency questionnaire, resulting in a participation rate of 69.7%. Students' non-responses occurred because of their absence from school on the day that the survey was administered. All classes that participated in the study received a gift of 1,000 NOK. An identification number was assigned to both students and their parents to link the questionnaires completed by each. A total of 335 parents responded to the questionnaire, leading to a response rate of 45.1%. Registered information on both parents and students was obtained for 308 dyads, in total. These 308 dyads, comprising 131 boys and 177 girls, with their parents, represented the total sample in this study.

This study was conducted according to the guidelines laid down under the Helsinki Declaration, and all procedures involving human subjects were approved by the Norwegian Social Science Data Services. Written consent was obtained from both the parents and from the adolescents themselves.

## Study population

Table 1 depicts the students' main characteristics. Their mean age was 13.9 years, and 11.6% of the students were considered overweight according to the classification by Cole, Bellizzi, Flegal, and Dietz (2000) used in this study. A low education level (≤ 12 years of education) was reported by 41.6% of the mothers and 48.7% of the fathers, and a higher education level (>12 years of education) was reported by 58.4% of the mothers and 51.3% of the fathers (see Table 2).

**Table 1 Characteristics of participating adolescents**

| | Boys (n = 131) Mean (SD) | Girls (n = 177) Mean (SD) | p-valuea | Total (n = 308) Mean (SD) |
|---|---|---|---|---|
| Age (years) | 13.9 (0.3) | 13.9 (0.3) | 0.174[a] | 13.9 (0.3) |
| Height (cm) | 171.4 (8.0) | 164.7 (6.8) | <0.001[a] | 167.5 (8.0) |
| Weight (kg) | 58.0 (11.2) | 53.9 (8.8) | <0.001[a] | 55.7 (10.1) |
| BMI (kg/m2) | 19.7 (2.8) | 19.9 (2.8) | 0.525[a] | 19.8 (2.8) |
| **Dietary habits** | **Mean (SD)** | **Mean (SD)** | | **Mean (SD)** |
| Fruits (times/day) | 1.8 (1.6) | 2.0 (1.6) | 0.289[a] | 1.9 (1.6) |
| Vegetables (times/day) | 1.9 (1.7) | 2.1 (1.3) | 0.113[a] | 2.0 (1.5) |
| Total FV (times/day) | 3.7 (2.9) | 4.1 (2.5) | 0.121[a] | 3.9 (2.7) |
| Fish (times/week) | 2.1 (2.0) | 1.6 (1.5) | 0.020[a] | 1.8 (1.7) |
| Fast food (times/week) | 1.7 (1.2) | 2.3 (1.6) | <0.001[a] | 1.9 (1.4) |
| | n (%) | n (%) | | n (%) |
| Overweight n (%)[c] | 16 (12.5) | 19 (11) | 0.685[b] | 35 (11.6) |

*Note.* SD: Standard deviation.

[a] Differences between sexes were compared by performing two-sample t-tests[b]

A chi square test was conducted for categorical data.

[c] Weight status was classified using specified sex and age related cutoff points for the ages of 13 and 14 years using Coles' standard definition (15).

**Table 2 Parental characteristics**

| Parental education[a] | n (%) |
|---|---|
| **Mother** | **305** |
| Lower | 127 (41.6) |
| Higher | 178 (58.4) |
| **Father** | **298** |
| Lower | 145 (48.7) |
| Higher | 153 (51.3) |
| **I often make food myself**** | **N (%) (307)[b]** |
| Strongly disagree | 1 (0.3) |
| Disagree | 17 (5.5) |
| Agree to some extent | 95 (30.9) |
| Agree | 106 (34.5) |
| Strongly agree | 88 (28.7) |

*Note.* [a] Lower education ≤ 12 years of education at elementary school, high school, or vocational school. Higher education: college or university attendance.

[b] One parent did not fill in the question on agreement regarding food preparation at home.

**Measures**

Each of the questionnaires designed for parents and students, respectively, was pre-tested for its clarity and length within a small sample of parents and students in the same age groups and in the same location in Norway prior to conducting the main study. The participants in the pilot study did not participate in the main study.

**Food Frequency Questionnaire (FFQ)**

Students reported their own food and drink intake using a validated and retrospective online food frequency questionnaire (FFQ) (Øverby, Johannesen, Jensen, Skjaevesland, & Haugen, 2014). The questionnaire was completed by the students at school in the presence of two project workers. Completion of the questionnaire took about 45 minutes. Respondents indicated how frequently they had consumed 112 food items and 20 types of drinks during the last four weeks. The FFQ measured one item per question. The analysis presented here is based on a subset of 32 items from the FFQ that were categorised into five food groups: fruit (f), vegetables (v), total fruits and vegetables (fv), fish, and the collective category of fast foods. These were selected based on current dietary recommendations and because of their importance to health and their particular relevance to the aims of this study. Fruit variables included apples, pears, bananas, oranges/tangerines/grapefruits, nectarines/peaches/plums, dried fruit, melons, kiwis, pineapples, fresh/frozen berries, and grapes and raisins. Vegetables included broccoli, cauliflower, onion/garlic/leek, avocado, corn, mushrooms, peas, mixed lettuce, peppers, carrots, and cucumbers. Variables for fish eaten at dinner comprised fatty and lean fish, as well as other fish products such as fish balls, fishcakes, fish sticks, and puddings. The fast food variable included hot dogs, pizza, burgers, and fries. The response categories in the questionnaire for fruit and vegetables were: 'never', '1–3 times a month,' 'once a week,' '2–3 times a week,' '4–6 times a week,' and '1 or more times a day.'

Prior to merging and creating a new variable, all fruit and vegetables variables, these items were recoded to reflect consumption in terms of the number of times per week (0, 0.5, 1, 2.5, 5, and 10). The result obtained after merging the variables was divided by 7 to reflect consumption in terms of the number of times per day. The following alternative frequencies were determined for fish and fast food variables: 'never,' '1–3 times a month,' 'once a week,' '2–4 times a week,' 'more than 4 times a week.' To reflect weekly consumption, these variables were re-coded into the following values: 0, 0.5, 1, 3, and 5, and then summed, resulting in a range from 0–20 times/week for fast food consumption and 0–15 times/week for fish consumption.

The questionnaire also included items on participants' backgrounds such as sex, age, height, and weight. To classify the weight status of students, Coles' standard definition was used throughout the study for determining specific sex and age related cut-off points for adolescents aged 13 to 14 years. These were similar to the standard 25 kg/m2 that is widely used for adults who are overweight (Cole et al., 2000). These cut offs were 21.91 kg/m2 and 22.58 kg/m2 for boys and girls aged 13 years, respectively, and 22.62 kg/m2 and 23.34 kg/m2 for boys and girls aged 14 years, respectively.

**Data from parents**

To assess the level of parents' education and whether they prepared food, the parents of participating students completed an online questionnaire downloaded at the project's website. The education level of parents, both mothers and fathers, was measured as the total number of years of education completed by the respondents. These values were grouped according to a classification system based on four categories: primary school (9 years or less), upper secondary education or vocational school (3 years of secondary education), university or university college (4 years or less), and university or university college (more than 4 years). For our analysis, we divided the four levels of parents' education into low education level (equal or less than 12 years of education) and high education level (completed college or university education). The question of whether food was prepared at home was articulated as follows: *How does this apply for you? I make most meals myself.* Alternatives for responding to this question ranged from *strongly agree* to *agree*, *agree to some extent*, *disagree*, and *strongly disagree*. When analysing this variable, only 1 person chose the alternative: *strongly disagree*. The groups *disagree* and *strongly disagree* were therefore added to one group. In the analysis the variable was coded: *disagree*, *agree to some extent*, *agree*, and *strongly agree*.

### Data analysis and statistics

All statistical analyses were performed using the statistical software package (SPSS) version 22.0 (IBM Corporation, Armonk, NY, USA). Descriptions of participants and their diets were presented as medians with an interquartile range or percentages using descriptive statistics. Comparisons between the two sexes were performed using two-sample t-tests for continuous data, and the chi square test for categorical data. Comparisons across categories of food preparations were made with One-Way-ANOVA. Simple and multiple linear regressions were used to assess the association between dependent variables, that is, dietary variables (fruits, vegetables, total fruit and vegetables, fish, and fast food). The independent variable consisted of the extent to which parents perceived that they made meals themselves. Both crude and adjusted results are presented here. Adjustments were made for sex and parental education. A *p*-value of ≤ 0.05 was considered to be statistically significant. All respondents were included in the analysis. Only a few missing responses were registered in the questionnaires, and these were treated as missing in the analysis by excluding cases, listwise.

## Results

The overall mean frequency of consumption of all fruits and vegetables was 3.3 times a day, with daily consumption frequency being 4.1 times/day for girls and 3.7 times a day for boys. The mean frequency of fish consumption was 1.5 times/week, being slightly higher for girls than for boys ($p$ = 0.02). The mean frequency of fast food consumption was 1.8 times per week. Conversely, the frequency of fast food consumption was slightly higher among boys than among girls ($p < 0.001$) (Table 1). Approximately 63% of the parents *agreed* or *strongly agreed* that they often prepared food themselves at home (Table 2). In Table 3 mean frequency of food items are presented according to how parents *agree* that they make food at home. There were no significant differences between the categories of home food cooking for fast food consumption in adolescents. For fruits and fish, both those who *disagree* and *strongly agree* to make food at home have adolescents with higher intakes than those with middle values (Table 3). For vegetables, there is an increase in frequency with higher agreement of parents making food at home.

There was a crude positive association between parental perceptions regarding the extent of home food preparation and consumption of vegetables (B: 0.27, 95 CI: 0.23, 1.70), as well as fruit and vegetables, collectively (B: 0.45 95 CI: 0.11, 0.78), by adolescents, even after adjusting for sex and parental education (Table 4). This indicates that the more parents *agree* that they make food at home, the higher reported consumption of fruits and vegetables their child has, corresponding to Table 3. No significant association was found between food preparation at home and fish consumption (B: 0.15, 95 CI: –0.07, 0.37), fruits (B: 0.18 95CI:-0.03, 0.39) or fast food consumption (B:–0.10 95 CI: –0.27, 0.08).

**Table 3 Mean frequency (SD) of dietary habits across parental report of agreeing on making food at home**

| | Disagree[1] | Agree to some extent (*n* =95) | Agree | Strongly agree | p-value[2] |
|---|---|---|---|---|---|
| | (*n* =18) | | (*n* =106) | (*n* =88) | |
| Fruits | 2.3 (1.6) | 1.7 (1.5) | 1.7 (1.4) | 2.3 (1.9) | 0.015 |
| (times/day) | | | | | |
| Vegetables (times/day) | 1.8 (1.4) | 1.8 (1.4) | 1.9 (1.3) | 2.4 (1.8) | 0.019 |
| Total FV[3] (times/day) | 4.1 (2.4) | 3.5 (2.3) | 3.7 (2.3) | 4.8 (3.3) | 0.006 |
| Fish | 2.5 (3.6) | 1.5 (1.4) | 1.8 (1.5) | 2.2 (1.7) | 0.019 |
| (times/week) | | | | | |
| Fast food (times/week)c | 2.2 (2.6) | 2.0 (1.6) | 1.9 (1.2) | 1.9 (1.4) | 0.774 |

*Note.* [1]Results of *strongly disagree* (*n* =1) is added to *disagree* (*n* =17). [2]One-way-ANOVA. [3]FV: fruits and vegetables

**Table 4** **Crude and adjusted regression coefficients of the associations between parents' reports of meal preparation at home and consumption of fruits, vegetables, total fruits and vegetables, fish and fast food**

| | Crude (n = 307)[a] B (95%CI) | p-value | Adjusted (n = 303)[b] B (95%CI) | p-value |
|---|---|---|---|---|
| Fruits (times/day) | 0.18 (-0.02, 0.37) | 0.084 | 0.18 (-0.03, 0.39) | 0.086 |
| Vegetables (times/day) | 0.27 (0.23, 1.70) | 0.004 | 0.28 (0.09, 0.47) | 0.003 |
| Total fruits and vegetables (times/day) | 0.45 (0.112, 0.78) | 0.008 | 0.46 (0.122, 0.80) | 0.008 |
| Fish (times/week) | 0.15 (-0.07, 0.37) | 0.174 | 0.11 (-0-11, 0.34) | 0.322 |
| Fast food (times/week)c | -0.08 (-0.25, 0.10) | 0.38 | -0.10 (-027, 0.08) | 0.247 |

B=Unstandardized regression coefficient.

[a] One parent did not fill in the question on agreement regarding food preparation at home.

[b] Sex and education of mothers and fathers were adjusted.

[c] Fast food is a sum score of: hot dogs, pizza, burgers, and fries

## Discussion

The results of this study indicate that a positive association exists between parental perceptions regarding the extent of home food cooking and the vegetables consumed by adolescents. However, such associations were absent for the consumption of fish or fast food and fruits alone. Previous studies have examined the relationship between food prepared at home and diet quality in relation to young adults (Larson et al., 2006), but not adolescents. Most studies on children and adolescents in this area have focused on their involvement in meal preparation, with the majority concluding that diet quality was better when children and adolescents were involved (Chu et al., 2014). However, not all of the studies reached this conclusion (Laska et al., 2012).

The intake of vegetables is low in the diet of Norwegian adolescents (Øverby & Andersen, 2002). The findings of this study indicate that one way to increase this intake is to promote home food preparation. However, many find home food cooking difficult, and the most frequently reported barriers to home cooking are time constraints and lack of cooking skills (Monsivais, Aggarwal, & Drewnowski, 2014). While low levels of cooking skills have been reported in some countries (Virudachalam et al., 2014; Möser, 2010; Jabs et al., 2007), recent reports from the UK indicate that most adults are confident regarding their cooking skills, although socioeconomic differences do exist (Adams et al., 2015). We do not know these numbers for Norwegian adults. Our results, however, indicate that it might be important for interventions aimed at improving the diets of adolescents to focus on skills and time, as well as on the importance of homemade food.

One hypothesis of this study was that home food preparation would result in an increase in fish intake. However, this was not supported by the results of the regression analysis. In the crude presentation of intake across categories of home food preparation, it seemed that those who disagreed with making food at home had just as high intake as those agreeing. It might be that fish is more often eaten out of home, or that homemade fish are more seldom than one might think. One could speculate that parents find it more difficult to make fish than other dishes, and therefore those not preparing foods themselves have higher intakes. In Norway, both adults and children have a low fish intake (Øverby & Andersen, 2002; Totland et al., 2012). The results of this study may just highlight the occurrence of little variation in fish intake, and, therefore, no association with home food preparation in regression analysis. The results also do not support a lower intake of fast food with increasing reports of food preparation at home. Larson et al. found that young adults who reported frequent food preparation consumed fast food less frequently (Larson et al., 2006). One reason for the lack of an association with fast food may be that food items such as burgers and hot dogs that were included in the questionnaire could be prepared at home in the same way as at a fast food restaurant. However, this needs to be investigated further.

The current study had several limitations. First, all of the data were self-reported. Underreporting is a major problem in dietary studies, especially among adolescents (Livingstone, Robson, & Wallace, 2004; Lioret et al., 2011). In addition, adolescents may be less motivated to report what they eat and drink than adults (Livingstone et al., 2004). Further, the question regarding home food preparation could have been framed more precisely as a question relating to the frequency of

consumption rather than as parents' perceptions of the extent to which they prepared food themselves. Future studies should include more questions on the cooking of food as well as the involvement of adolescents in food preparation. Another limitation concerned the low response rate of parents. While several parents consented to the participation of their children in the study, they did not themselves answer the questionnaire. The reason for this may be that they simply did not want to participate or that they did not see the survey link after recording their consent to participate. Another limitation of this study was its cross-sectional design which could not determine causality. To demonstrate causality, intervention studies are needed.

Despite these limitations, the study had several methodological strengths. It was a population-based study with a relatively high response rate among adolescents, and data were obtained from both adolescents and their parents. The education level of the parents was somewhat higher than that of the general population within this age group. However, the education levels of mothers were comparable with the average for women in this age group, with more than 50% of women aged 25–39 years in Norway having attained a higher level of education (Statistics Norway, 2017). The study was also strengthened by representation of participants from both urban and rural communities, providing variation within the sample.

## Conclusions

In sum, there is a positive association between parents' reporting of food preparation at home and total intake of fruits and vegetables among adolescents in the study. However, intervention studies are necessary to examine whether a causal relationship exists between home food cooking and vegetable intake among adolescents.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# Home economics literacy—What in the world are we saying?

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## Abstract

*Building on previous research which presented a folksonomy of Home Economics (Pendergast, 2013) through the analysis of all refereed papers published in the* International Journal of Home Economics*, this paper presents an updated and more comprehensive analysis extended to consider the presence of the notions of hope and happiness. Content analysis of all publications and the application of Leximancer was employed to identify the major themes in the professional literature of the field. A specific search for the concepts of hope and happiness was also conducted using this methodology. A number of key themes continue to resonate in the field. The prevalence of* hope *and* happiness *is less evident. Statistical insights are shared in this paper. The findings suggest that the explicit connections to hope and happiness may not be evident in our field and this is a strategy for moving the profession into a sustainable position.*

**KEYWORDS: HAPPINESS, HOME ECONOMICS LITERACY, WELL-BEING**

## Literature review

Folksonomy is a vocabulary of tags emerging from the content being analysed and represents a kind of taxonomy of text around a field. In 2010, a study revealed there is an emerging folksonomy of Home Economics. In her search for this folksonomy Pendergast (2010) utilised the concept of tag clouds to explore two important texts of the time produced as artefacts of the centennial celebrations of the profession—the IFHE Position Statement (IFHE, 2008) and the IFHE Congress Proceedings (IFHE, 2008). Using tag clouds to analyse these texts revealed a consistency in the relational aspects of many terms which appeared in the documents. Tag clouds were used to create a visual hierarchy of the text and evidence of frequently used proactive terms was abundant. This study concluded that a high degree of alignment of the terms used in the IFHE Position Statement and the IFHE Congress Proceedings was evident, with five words: *Home Economics* (first and second, respectively), *profession* (second and first), *social* (sixth and third), *life* (seventh and fifth), and *future* (eighth and ninth) appearing in the top ten list for both analyses. These five words dominated in the visual impression presented in the tag clouds (represented by proportional font size), which means they were used abundantly in the texts, suggesting a consistent emphasis on these terms in these artefacts.

The term *family* also had high impact in the tag clouds and was the third most frequent and twelfth most frequent term in the Position Statement and Congress Proceedings, respectively. Other terms associated with the profession's connection with people stood out in the tag clouds, in particular, the words *social* (sixth and third, respectively) and *individual* (fifth and 24th). Also, the word *food*

Pendergast, D. (2017). Home economics literacy—what in the world are we saying?. *International Journal of Home Economics, 10* (1).
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was strongly featured in the IFHE Congress Proceedings tag cloud, appearing in large font as it was the fourth most frequently used term. Interestingly, the following words featured on either or both clouds: *achieve*, *act*, *action*, *advocate*, *challenge*, *change*, *consume*, *develop*, *educate*, *empower*, *facilitate*, *impact*, *improve*, *include*, *lead*, *organize*, *practice*, *produce*, *reflect*, *serve*, *study*, *sustain*, *transform*, *understand*, and *value*. These words reflect an action-oriented field. It is the frequency, consistency and emphasis of these terms that leads to the development of the folksonomy of the profession, the vocabulary that is being produced from the tag clouds that literally build a word picture of the profession. This folksonomy has been collectively produced by the various authors contributing to the written documents, and the tag clouds have extracted the key terms for easy viewing. It is apparent from the analysis of these documents that a folksonomy for Home Economics is likely to feature the terms identified in these two documents. The high degree of consistency suggested at the time that there was a folksonomy emerging, even with the limited analysis conducted at that point. Of note was the predominance of gendered terms which favoured feminine terminology.

In 2013 a further investigation revealed there continued to be an emerging folksonomy of Home Economics evident through the analysis of all refereed papers published in the 11 issues of the *International Journal of Home Economics* (IJHE), from 2008 until mid-2013. In this benchmark study, Pendergast (2013) noted that there was a "consistently developing folksonomy associated with the field of Home Economics" (2013, p. 57). This means there was evident a high degree of predictability about the terms and phrases used by Home Economics professionals in their officially published international journal. The most frequently appearing terms in the journal were, in order: *Home Economics*; *food*; *health*; *education*; and *study*.

Comparing the 2010 and 2013 data sets, in 2010 five words: *Home Economics*; *profession*; *social*; *life* and *future* appeared in the top ten list for the analysis of both the World Congress Proceedings (IFHE, 208) and the IFHE Position Paper (IFHE, 2008). In 2013 these five words again featured prominently in the data, with *Home Economics* again emerging as the most frequently used word, with *profession* (8th), *social* (15th), *life* (18th) and *future* (26th) also appearing in very large numbers throughout the analysis of the journal. It is interesting that note that *food* was prominent in both studies, but more strongly so in the 2013 study.

This study will extend this work by conducting a text frequency analysis and then a thematic content analysis of the text presented in all 14 issues of the *International Journal of Home Economics* (IJHE) from January 2008 to December 2014. This will update and add a more comprehensive understanding of the journal to date. Secondly, the study seeks to explore the presence of the specific concepts of *hope* and *happiness* which are featured at this time as an important focus of the profession, and indeed are the focus for the 2016 World Congress of the International Federation for Home Economics. Specifically, the Congress aims to provide an opportunity for dialogue about the "role of Home Economics in the pursuit of hope and happiness for individuals now and in the future" (IFHE, 2015). This Congress theme emerged out of global interest as reflected in government policies and through the promotion of strategies to enhance hope and happiness for individuals, communities, nations and ultimately the wider global community. With an existing goal of optimising the well-being of individuals and families (IFHE, 2008), exploring the role the field plays in the pursuit of hope and happiness, which are captured in the domain of subjective well-being, is both timely and important for the field as it looks to sustainable practices now and in the future.

## Method

In order to investigate the development of a folksonomy along with the presence of terms *hope* and *happiness* in the Home Economics literature, a text analysis of the peak international publication of the field was undertaken. Initially, a frequency of text analysis is undertaken, then a thematic content analysis employing Leximancer is employed to generate themes and to look at the relationships between the key concepts. The analysis of the IJHE is based in the inductive research methodology of grounded theory, through computer-aided analysis of the content of the entire publication, examining themes and concepts and their relationships.

### The Journal

The *International Journal of Home Economics* (IJHE) is published electronically twice a year by the International Federation of Home Economics (IFHE). Intended to be an international publication to

highlight research and discussion in the field, IJHE utilises a comprehensive peer-review process to ensure relevance and quality of submissions meet an acceptable standard for publication. The focus of the publication is emergent work in all aspects of Home Economics. Table 1 provides a summary of the number of articles published in each of the issues across the seven years of publication to date, along with the word count for each year of publication.

**Table 1 Number of articles across seven years of publication**

| Year | Volume | Issue 1 | Issue 2 | Total | Word count |
|---|---|---|---|---|---|
| (Nvivo) | | | | | |
| 2008 | 1 | 9 | 6 | 15 | 64,938 |
| 2009 | 2 | 7 | 7 | 14 | 76,931 |
| 2010 | 3 | 3 | 3 | 6 | 28,257 |
| 2011 | 4 | 4 | 4 | 8 | 33,750 |
| 2012 | 5 | 6 | 18 | 24 | 106,246 |
| 2013 | 6 | 12 | 12 | 24 | 96,965 |
| 2014 | 7 | 5 | 6 | 11 | 59,226 |
| | | | **Total** | **102** | **466,313** |

For the purpose of this investigation, all papers published in the journal from 2008 to 2014 were included as part of the study. The IJHE has a unique peak body position in the field hence an analysis of elements of the journal provides a useful context for discussions regarding the presence of folksonomy and of notions of hope and happiness in this source of literature.

Across the 102 articles, there were a total of 146 contributors. 126 authors contributed to one article only, while 20 authors contributed to at least two articles, and one particularly prolific author contributed to 11 and always as lead but not always as the only author. This information is presented diagrammatically in Figure 1.

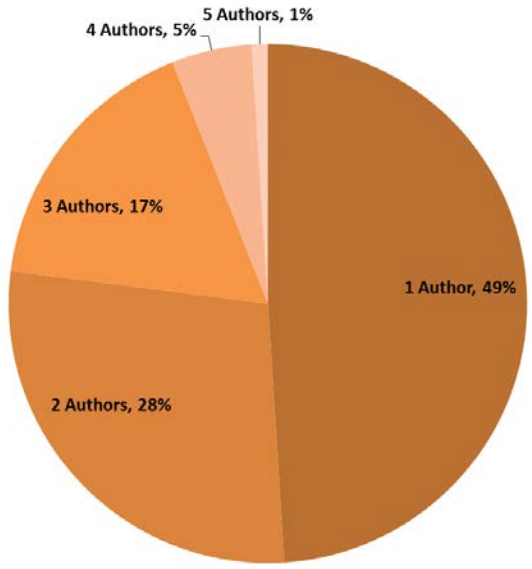


**Figure 1 Article authorship—Number of authors per paper, as percentage of papers**

Interestingly, the nationality of authors suggests the IJHE is seen to be a repository for the field by experts around the world, with authors aligning themselves with 26 countries. The number and proportional word count considered in relation to the nationality of the author is presented in Table 2.

**Table 2 Contribution (word count) by nationality of author**

| Country | IJHE Authors* (n = 143) | % IJHE authors | Word count | Percent total word count |
|---|---|---|---|---|
| USA | 37 | 25.87 | 83976 | 18.27 |
| Canada | 10 | 6.99 | 74110 | 16.13 |
| Nigeria | 14 | 9.79 | 38961 | 8.48 |
| Australia | 6 | 4.20 | 34723 | 7.56 |
| Denmark | 3 | 2.10 | 30965 | 6.74 |
| Finland | 11 | 7.69 | 29167 | 6.35 |
| South Africa | 7 | 4.90 | 23546 | 5.12 |
| UK | 5 | 3.50 | 21595 | 4.70 |
| India | 9 | 6.29 | 17677 | 3.85 |
| Ireland | 6 | 4.20 | 17355 | 3.78 |
| Swaziland | 4 | 2.80 | 12177 | 2.65 |
| Japan | 6 | 4.20 | 10481 | 2.28 |
| The Netherlands | 4 | 2.80 | 8406 | 1.83 |
| Germany | 3 | 2.10 | 7939 | 1.73 |
| Switzerland | 2 | 1.40 | 7375 | 1.60 |
| Kenya | 3 | 2.10 | 6201 | 1.35 |
| Sweden | 1 | 0.70 | 5530 | 1.20 |
| Malta | 2 | 1.40 | 5474 | 1.19 |
| Mauritius | 2 | 1.40 | 5334 | 1.16 |
| Egypt | 2 | 1.40 | 3798 | 0.83 |
| Malaysia | 1 | 0.70 | 2697 | 0.59 |
| Malawi | 1 | 0.70 | 2336 | 0.51 |
| Jamaica | 1 | 0.70 | 1588 | 0.35 |
| Korea | 1 | 0.70 | 1404 | 0.31 |
| Singapore | 1 | 0.70 | 1404 | 0.31 |
| United Arab Emirates | 1 | 0.70 | 1404 | 0.31 |

*Note.* *Thinktank contribution not used as individual authors not known

This data translates into a heat map representation illustrating where the words from the Journal are authored, as presented in Figure 2.

## Data

All 102 articles published in IJHE were converted to Microsoft Word to allow for the removal of headers, footers, references, and other formatting graphics, figures, number-based tables, author details, acknowledgements and notes. Where tables were formatting devices used to layout sentence text in dot points, these were converted to text. Using the data cleansing processes refined previously (see Pendergast, 2010, 2013) and importantly including the removal of the top 100 functional words (e.g., and, but, is the), the frequency of terms was generated across the data set. In addition, the words *happy*, *happiness* and *hope* were also considered for reporting. However, it became apparent in an initial search for the terms *happiness*, *happy* and *hope* that not all appearances of these terms were relevant to the research, namely:

- *Happy* was most often used in the context of the authors' evaluation of a concept, or their perception of others' evaluation of concept, rather than an evaluation of life satisfaction; and
- *Hope* was most often a stylistic device used in writing to engage the reader, rather than referring to a participant's viewpoint.

When *happiness*, *happy* and *hope* were used in any of these ways unrelated to the intended meaning in this study, it was included in the frequency count, but a note related to relevance was made. The findings will be presented with this distinction in place.

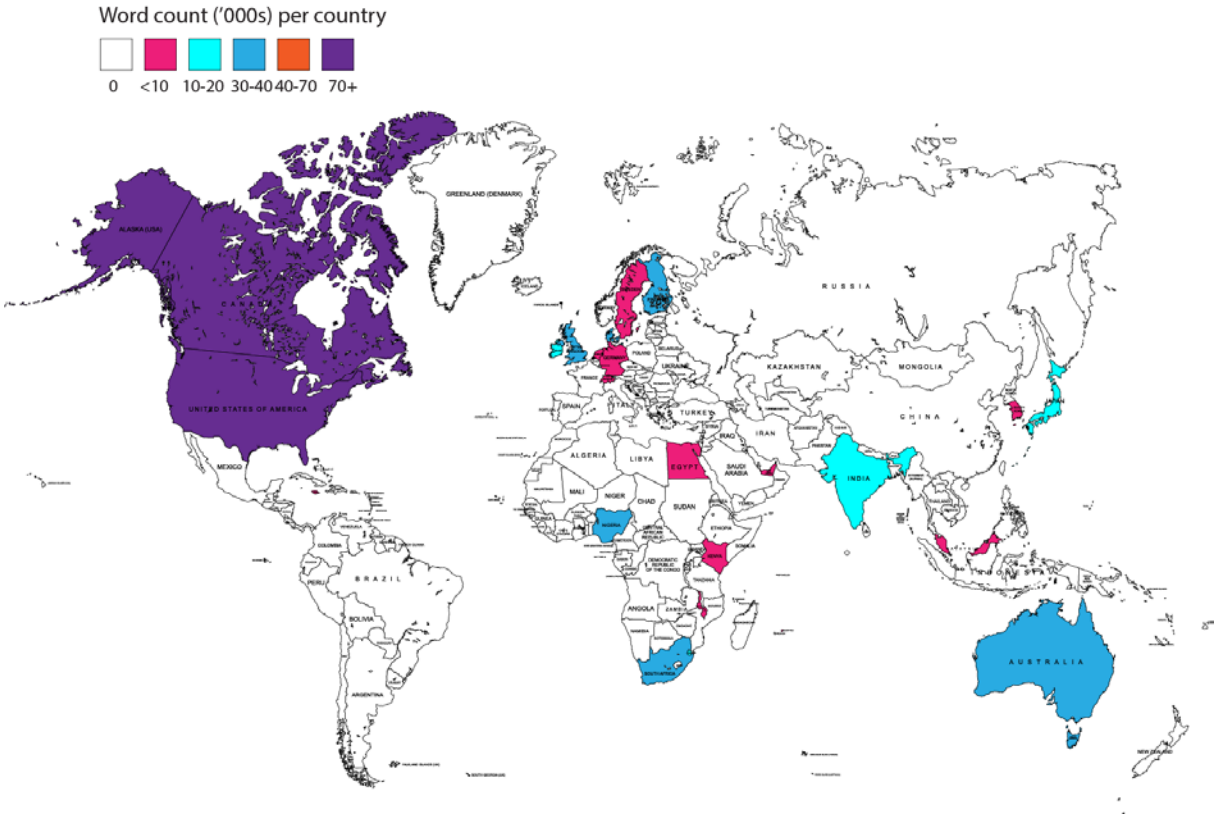


**Figure 2** **Word count per country**

## Findings and discussion

### Most frequent terms

The frequency of the top 50 terms, after removal of functional words and cleansing of the text in the 102 articles is presented in Table 3. Included in this table is the actual number of times the word appears, the percentage of the data set this represents, and the rank in terms of frequency of word use across the entire dataset.

**Table 3 Top 50 words IJHE, 2008—2014**

| Word | F | (%) | Rank |
|---|---|---|---|
| home economics | 1855 | 0.64 | 1 |
| food | 1831 | 0.63 | 2 |
| education | 1248 | 0.43 | 3 |
| health | 1209 | 0.42 | 4 |
| study | 1025 | 0.35 | 5 |
| students | 873 | 0.30 | 6 |
| profession | 867 | 0.30 | 7 |
| human | 764 | 0.26 | 8 |
| life | 764 | 0.26 | 9 |
| family | 763 | 0.26 | 10 |
| social | 748 | 0.26 | 11 |
| people | 744 | 0.26 | 12 |
| research | 725 | 0.25 | 13 |
| consumer | 697 | 0.24 | 14 |
| knowledge | 691 | 0.24 | 15 |
| respondents | 645 | 0.22 | 16 |
| being | 634 | 0.22 | 17 |
| development | 616 | 0.21 | 18 |
| women | 568 | 0.20 | 19 |
| world | 556 | 0.19 | 20 |
| families | 555 | 0.19 | 21 |
| future | 544 | 0.19 | 22 |
| different | 533 | 0.18 | 23 |
| school | 526 | 0.18 | 24 |
| learning | 517 | 0.18 | 25 |

| Word | F | (%) | Rank |
|---|---|---|---|
| professional | 493 | 0.17 | 26 |
| children | 489 | 0.17 | 27 |
| years | 475 | 0.16 | 28 |
| skills | 467 | 0.16 | 29 |
| needs | 462 | 0.16 | 30 |
| literacy | 458 | 0.16 | 31 |
| need | 452 | 0.16 | 32 |
| society | 445 | 0.15 | 33 |
| important | 432 | 0.15 | 34 |
| level | 428 | 0.15 | 35 |
| practice | 406 | 0.14 | 36 |
| consumption | 405 | 0.14 | 37 |
| results | 404 | 0.14 | 38 |
| cooking | 402 | 0.14 | 39 |
| data | 401 | 0.14 | 40 |
| teachers | 397 | 0.14 | 41 |
| change | 390 | 0.13 | 42 |
| dress | 368 | 0.13 | 43 |
| nutrition | 366 | 0.13 | 44 |
| care | 334 | 0.11 | 45 |
| consumers | 334 | 0.11 | 46 |
| reported | 329 | 0.11 | 47 |
| factors | 327 | 0.11 | 48 |
| individual | 324 | 0.11 | 49 |
| values | 320 | 0.11 | 50 |

When comparing the textual frequency analysis across the three studies to date, Table 4 provides a summary of the top five terms used. It is pertinent to note that the 2013 and 2015 studies share a large chunk of data, both being an analysis of the IJHE text, with 79 articles contributing to the 2013 study also included in the 2015 study. Both studies reveal the top five terms to be the same, with *Home Economics* and *food* the two leading terms. The 2010 analysis reveals a different focus, with terms appearing that in 2015 are relegated to lower frequencies in the IJHE, for example, *life* (ranked 9) in 2015 but fourth in 2010. The remaining top five: *profession*, *social* and *future*—all appear after the top 5 50 but in the top 100 of the 2015 IJHE data.

**Table 4 Comparison of Top five terms in the 3 text analysis studies**

| **Top 5 terms (frequency)** | **2010** | **2013** | **2015** |
|---|---|---|---|
| **Analysis of:** | **2008 World Congress Proceedings; IFHE Position Paper** | **11 issues of IJHE comprised of 79 articles** | **14 Issues of IJHE comprised of 102 articles** |
| 1 | home economics | home economics | home economics |
| 2 | profession | food | food |
| 3 | social | health | education |
| 4 | life | education | health |
| 5 | future | study | study |

### Hope and happiness

This study also sought to identify the frequency and relevance of the concepts of *hope* and *happiness* as evident through the text analysis of IJHE. As previously noted, only the relevant use of the terms was included in this analysis. Table 5 provides a summary of the years and issues where the terms were used textually within articles. Table 6 provides an actual frequency of the use of the terms across the entire data set. Table 6 indicates is that in all cases, the word *happiness* appears 21 times in 13 different papers, always in ways relevant to this study. For the term *happy*, in almost half of the cases in which it is used it does not relate to the study and *hope* has an even smaller number of relevant appearances.

**Table 5 IJHE articles 2008—2014 containing terms happy, happiness and hope used relevantly**

| Year | 2008 | | 2009 | | 2010 | | 2011 | | 2012 | | | | 2013 | | | | 2014 | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Volume | 1 | | 2 | | 3 | | 4 | | 5 | | | | 6 | | | | 7 | | |
| Issue | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | | | 1 | | | 2 | 1 | 2 | |
| Happiness | | ✓ | ✓ | ✓ | ✓ | | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | 13 |
| Happy | | | | | ✓ | ✓ | | | | ✓ | | | | | | ✓ | ✓ | | 5 |
| hope | ✓ | | | | | ✓ | | ✓ | | ✓ | | | | | | ✓ | | | 5 |

**Table 6 Key terms absolute frequency and relevance across entire Journal**

| Word | Frequency | Number of papers in which word appears (of 102) | Frequency of relevant appearance | Relevance % |
|---|---|---|---|---|
| happiness | 21 | 13 | 21 | 100.00% |
| happy | 16 | 10 | 9 | 56.25% |
| hope(d/fully/s/lessness) | 42 | 25 | 5 | 11.90% |

## Content analysis

Leximancer is a concept exploration software tool, created to automatically analyse meaning from bodies of text, through the presence and frequency of words and phrases (Leximancer, 2011). When data are analysed, a map is generated of related concepts (co-occurrence of words, implicit and explicit) where the theme is the most conspicuous concept of clustered concepts. Using this computerised statistical method avoids researcher bias, which is a fundamental challenge for researchers (Pendergast & Twigg, 2015).

The text document for analysis that was generated from the 102 published IJHE articles uploaded into Leximancer with default settings, as the recommended approach to find initial concepts and themes before adjusting the settings to include word variants, compound concepts (for example *children* OR *children's*), adding low semantic-value words to the stoplist (*data*, *different*, *important*, *including*, *use*, *used*, *using*), and increasing the boilerplate cut-off, resulting in a map that included the most common themes. An interpretation of the map serves as an insight into the themes and hence core messages implicit in the Journal.

According to Grimbeek, Bryer, Davies and Bartlett (2005), Leximancer concepts are defined as "…frequently used terms around which other terms cluster". In this way, a relationship between the lead term and other frequently appearing terms can be established. In this analysis, the eight most frequently appearing terms were: *life*, *education*, *food*, *profession*, *women*, *respondents*, *dress* and *water*.

The comprehensive data resulting from the Leximancer analysis may also be used to generate a heat map which reflects the relationship between most frequently appearing concepts. For this study, the automatically generated heat map (see Figure 3) shows the concepts and themes identified across the Journal and their relationships with one another. The most frequent theme identified is the theme *life*, relating to every other theme on the map.

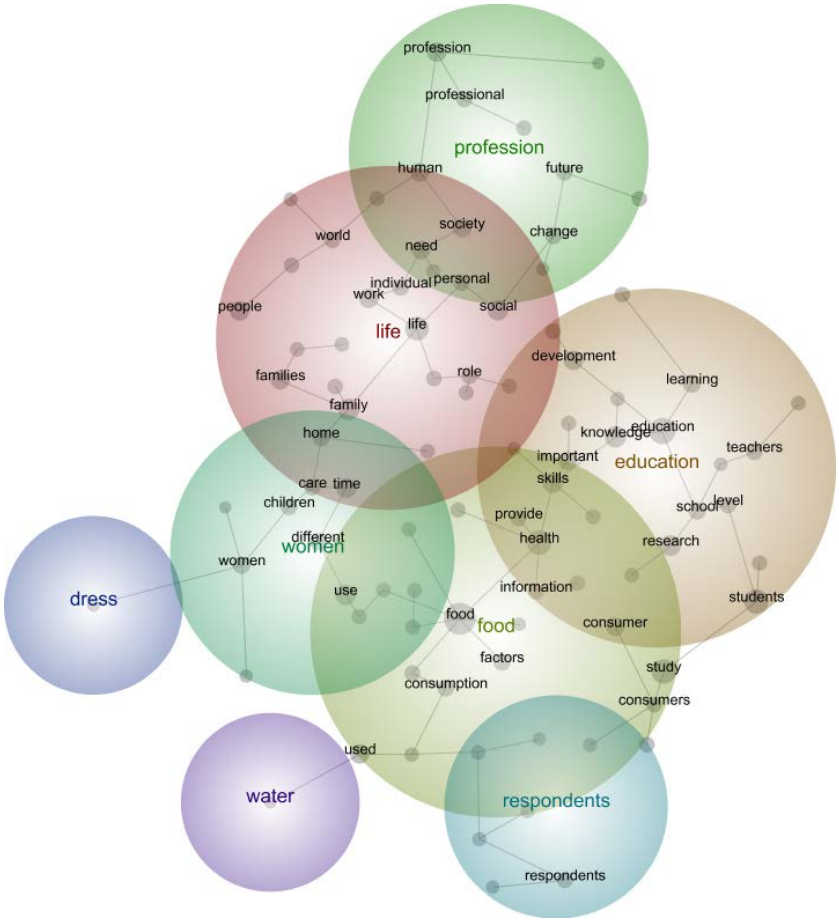


**Figure 3** **Leximancer map themes IJHE 2008—2104**

Within the theme of life, Leximancer generated the following eight themes: life, family, social, time, people, work, families, society, need, home, individual, world, role, personal, community and structured it as follows in Table 7.

**Table 7** **Theme: *Life* sub-themes, connectivity and concepts**

| Theme | Connectivity | Concepts |
|---|---|---|
| Life | 100 | life, family, social, time, people, work, families, society, need, home, individual, world, role, personal, community |
| Education | 85 | education, students, knowledge, research, skills, development, important, learning, school, teachers |
| Food | 84 | food, study, health, use, used, consumer, factors, consumption, provide, consumers, information |
| Profession | 34 | profession, human, change, future, professional |
| Women | 27 | women, different, children, care |
| Respondents | 18 | respondents |
| Dress | 02 | dress |
| Water | 01 | water |

Given IJHE deals with topics that connect with daily living, it is not surprising that *life* is the most salient term in this thematic analysis. A description of the associated concepts for each of the dominant themes now follows.

### Theme 1—Life

The most prominent theme emerging from the data analysis focused on the concept of *life*. Other concepts that were associated with this theme include: *family*, *social*, *people*, *work*, *families* and a

number of other related terms. This is consistent with the 2010 analysis of the 2008 World Congress Proceedings (IFHE, 2008) and the IFHE Position Paper (IFHE, 2008), which identified *life* as the fourth most prominent term used.

### Theme 2—Education

The second most prominent theme emerging from the data, and the one with the strongest association to Theme 1, is that of *education*. This theme could be considered to be the main subject of the Journal. Other key words associated with them included: *students*, *knowledge*, *research*, *skills*, and several other key ideas

### Theme 3—Food

This third prominent theme in generated from the data was that of *food*. Other related concepts revealed the emphasis of the Journal of *food* related to *health*, *use*, *consumer* and *consumption*; and *information*. The collective insights from the studies reveal that *food* is consistently a focus of the IJHE, emerging as second in the text frequency analysis and as a key theme through the Leximancer analysis.

### Theme 4—Profession

Also, a prominent theme generated from the data, the theme of *profession* is strongly evident in IJHE. This theme connects with *human*, *change* and *future* in particular, which would seem to be appropriate given the main theme of the profession.

### Theme 5—Women

The fifth theme the emerged from this analysis was that of *women*. The data analysis revealed this theme was presented in association with the concepts of particularly of: *different*, *children* and *care*. This theme is as expected reflected in the text frequency analysis over time, with the 2015 analysis revealing the word *women* to be the 19th ranked term in the IJHE. Interestingly, the 2010 analysis of the IFHE World Congress Proceedings (IFHE, 2008) and the IFHE Position Paper (IFHE, 2008) also revealed a strongly gendered use of language in those documents.

It is evident from the core themes generated from the data that all fall squarely within the remit of the IJHE as focusing on Home Economics education. What is important to note is the value of these themes in bringing together the data emerging from the frequency analysis. This thematic analysis allows for relational insights to deepen this understanding.

## Summary

This analysis set out to provide a snapshot of the *International Journal of Home Economics* 2008—2014. This was achieved through a thematic content analysis of the fourteen issues (102 papers) of the Journal. Eight dominant themes emerged: *life*, *family*, *social*, *time*, *people*, *work*, *families*, *society*, *need*, *home*, *individual*, *world*, *role*, *personal*, *community*. A frequency analysis of terms was conducted to identify the most frequently appearing terms which in turn contributes to the development of a folksonomy for the Journal. Finally, *happy*, *hope* and *happiness* were considered in the text analysis because they are a current focus of the profession, being the theme for the 2016 World Congress and closely aligned with the focus of the profession to optimise well-being. This study reveals that whilst these words did appear in the IJHE, they were not prominently used. It might be regarded from this analysis that the explicit connections to *hope* and *happiness* may not yet be evident in our field, and this is an exciting strategy for moving the profession into a sustainable position.

## Disclosure statement

No potential conflict of interest was reported by the author.

## Biography

Professor Donna Pendergast, PhD, is Dean of the School of Education and Professional Studies at Griffith University, Brisbane, Australia. Donna researches and writes about Home Economics philosophy, education and practice.

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# Home economics research: Instilling hope, re-directing source of happiness in individuals and families of contemporary society

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## Abstract

*Ninety-four years have passed since the discipline of Home Economics was established in the University of the Philippines (UP) under the College of Education in 1921 and forty-four years since the College of Home Economics (CHE) was established in 1961. At present, the College has five Departments, offers seven undergraduate and ten graduate programs. While many Home Economics institutions around the world have either been disintegrated or changed their names and* identities*, the UP College of Home Economics remained intact and continues to thrive and gain its rightful recognition in the various sectors it was mandated to serve—the academe, the government or general public; industry, individuals, families and households. Research played a key role in all these.*

*Utilising the new economic paradigm of well-being and happiness, this study determined the relevance Home Economics through a systematic review of a total of 1,315 reported research from 2003—2014/15. Themes and methodologies were determined to examine the breadth and depth of their coverage in light of modern day concerns. Results demonstrated the responsiveness and relevance of the studies in the UP CHE in addressing basic needs of individuals and families. Themes that run across the sub-disciplines, signifying their unified ethos and values, revolved around families and individuals in special circumstances, culture, disasters, public health and managing sickness in the home. Centrality of home and family was evident in addressing issues. Except for Food Science, which is generally experimental and quantitative in nature, research methodologies were mainly phenomenological, a crucial approach to quality of life studies.*

**KEYWORDS: HOME ECONOMICS, WELL-BEING, HAPPINESS, RESEARCH, CONTEMPORARY SOCIETY**

## Introduction

Home Economics as an academic discipline had been challenged time and again by the academic community (Stage & Vincenti, 1997) in terms of its relevance in the midst of a rapidly changing world and in terms of the legitimacy of its existence in the scientific community where philosophical and methodological sophistication is required in the pursuit of knowledge. Ninety-four years have passed since the discipline of Home Economics was established in the University of the Philippines (UP) under the College of Education in 1921. Forty years later, in 1961, the College of Home Economics (CHE) was established (Guzman, 1982). Presently the College has five Departments and offers seven undergraduate and ten graduate programs. The study of Roldan (1987) underlined UP CHE's success in breaking the stereotype that Home Economics is only for women as well as in its responsiveness to the needs of the industry, communities and families as reflected in the evolution of its courses. In

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1994, CHE embarked on the monumental Disciplinal Identity Development Project (DIDP) where the essence and parameters of each sub-discipline under the college was defined.

This study examined the role of Home Economics as an academic discipline through a systematic review of various researches conducted in UP CHE during the past twelve years. This undertaking aimed to provide empirical evidence of the importance and relevance of Home Economics in contemporary, post-modern society, to a world that seems to be getting bigger and smaller, colder and hotter, richer and poorer in the aspects of redirecting goals, experiencing happiness and instilling hope—a new paradigm that insists on the importance of a qualitative approach in evaluating the manner by which growth and development in the world must be viewed.

## Hope and happiness

Hope and happiness are important elements of life—providing vital inputs to motivation, energy, well-being and meaning. Theories related to hope are mainly psychological. They are either focused on hopelessness and depression caused by internal attributions (Abramson, Metalsky, & Alloy, 1989) or positively, following Snyder's (1994) theory, on hope's ability to impact various aspects of life such as health, well-being, spirituality and work, (Snyder, 1994). This study would mainly utilise the positive theory on hope where research on Home Economics on individual, family and environmental circumstances may play a role in providing options to mitigate or alleviate situations.

Happiness in this study follows the Veenhoven's (2013) definition where it is regarded as synonymous with *quality of life* or *well-being* and further clarified into four dimensions following distinctions between *inner and outer quality* and *life chances and results*. These four dimensions of quality of life are *livability of environment*, *life-ability of the person*, *utility of life* and *satisfaction* (Figure 1). Taking on the perspectives of ecologists and sociologists, *livability of the environment*, parallel to the term *welfare* of economists, refers explicitly to the characteristic of the environment, a condition for happiness rather than happiness per se. The *life ability of the person*, in other fields referred to as adaptive potential (Biology) or health (Medicine), is the ability and capacity of an individual to cope with life's problems. *Utility of life* refers to usefulness, higher value of life that attends to bigger purposes such as protection of environmental, while *satisfaction of life* refers to the inner, subjective view of outcomes of life commonly referred to as *well-being*, *satisfaction* or *happiness*.

| | **Outer qualities** | **Inner qualities** |
|---|---|---|
| Life-chances | Livability of environment | Life-ability of the person |
| Life-results | Utility of life | Satisfaction |

**Figure 1 Four Dimensions of Quality of Life (Veenhoven, R., 2000)**

A nation-wide study on the measurement of well-being of Filipinos (Sycip, Asis, & Luna, 2000) revealed that the most important components to their well-being are:

1. respect from family,
2. faith in God,
3. being Filipino,
4. prayer and reflection,
5. love of parents and siblings,
6. regular food,
7. house ownership,
8. security from crime,
9. unity of Filipinos,
10. love of children,
11. long life,
12. peace of mind,

13. doing good to others,
14. good marital relations,
15. being with children,
16. nutritious food,
17. love of spouse,
18. regular water,
19. clean surrounding and
20. share in decision-making.

Significantly, at least of these top twenty components of well-being for Filipinos neatly fall under Home Economics turf. This serves as a solid backdrop for this study.

## Methodology

A systematic review of reported faculty and student research 2003—2014/15 was undertaken to determine the relevance and posture of Home Economics as an academic discipline in contemporary society. Initially, studies conducted by the faculty were the only ones surveyed—but preliminary results did not produce enough themes to come up with meaningful results as studies were further segregated according to the seven sub-disciplines in CHE namely: Clothing Technology (CT), Community Nutrition (CN), Family Life and Child Development (FLCD), Food Science and Technology (FST), Interior Design, (ID) Home Economics Education (HEED) and Hotel, Restaurant and Institution Management (HRIM). Consequently, theses of students from both the graduate (G) and undergraduate (UG) levels were included. All of the sub-disciplines, except for the CT have masters program, and three have a PhD program: FS, N and Home Economics. Undergraduate programs, except for CN, have a thesis requirement from their students in their final year.

The premise of this move to include all students' theses in the review was that each student, whether graduate or undergraduate, goes through the rigors of work required of a good scientific study under the mentorship of a faculty adviser and is required to defend a proposal at the beginning and present the results at the end of the thesis project to a panel of at least two other faculty members. The inclusion of the students' theses would also provide insight into current disciplinal perspectives, interests and probable directions of the next generation of Home Economists.

Themes, implied purposes and utilisation were determined from the review of abstracts of the studies where actual manuscripts were sought when needed. Themes were developed from raw data gathered, going beyond the usual, traditional divisions amongst the sub-disciplines. The studies were further examined in terms of methodologies used. The studies were essentially examined in light of modern day concerns such as mass production of goods and consumerism; nutrition, health and food safety; the welfare of children, elderlies and strengthening of families; care of environment, sustainability of development and the realities of natural disasters and calamities frequently experienced in the country.

## Results

A total of 1,315 studies from 2013—2014/15 were surveyed, 62 (4.7%) from the faculty, 152 (11.6%) from graduate theses and dissertations and 1,101 (83.7%) from undergraduate students' theses Of the total studies reported, FST has the most (29.4%), followed by ID (22.1%). FLCD ranks third (17.8%), followed by CT (14.5%) and by HEED (13.1%). Nutrition (1.9%) and HRIM (1.2%) has the least, obviously due to the fact that theses are not required in their undergraduate programs (Table 1 and Figure 2).

The subsequent presentation of results is by sub-discipline. As sub-disciplines may be regarded in various ways, a definition of each is first presented to clarify parameters by which they are treated in the UPCHE. This is followed by the presentation of the various themes that surfaced from the survey and a brief description of main methodologies used.

**Table 1 Studies reported across sub-disciplines by proponent (2003—2014/15)**

| UPCHE Sub-Disciplines | Faculty | Students | | Total | % |
|---|---|---|---|---|---|
| | | G | UG | | |
| Clothing Technology | 2 | - | 189 | 191 | 14.5 |
| Family Life and Child Development | 9 | 91 | 134 | 234 | 17.8 |
| Food Science and Technology | 23 | 12 | 351 | 386 | 29.4 |
| Home Economics Education | 7 | 17 | 149 | 173 | 13.1 |
| Hotel Restaurant & Institution Management | 12 | 4 | - | 16 | 1.2 |
| Interior Design | 6 | 6 | 278 | 290 | 22.1 |
| Nutrition | 3 | 22 | - | 25 | 1.9 |
| **Total** | **62 (4.70%)** | **152 (11.60%)** | **1101 (83.70%)** | **1315** | **100** |

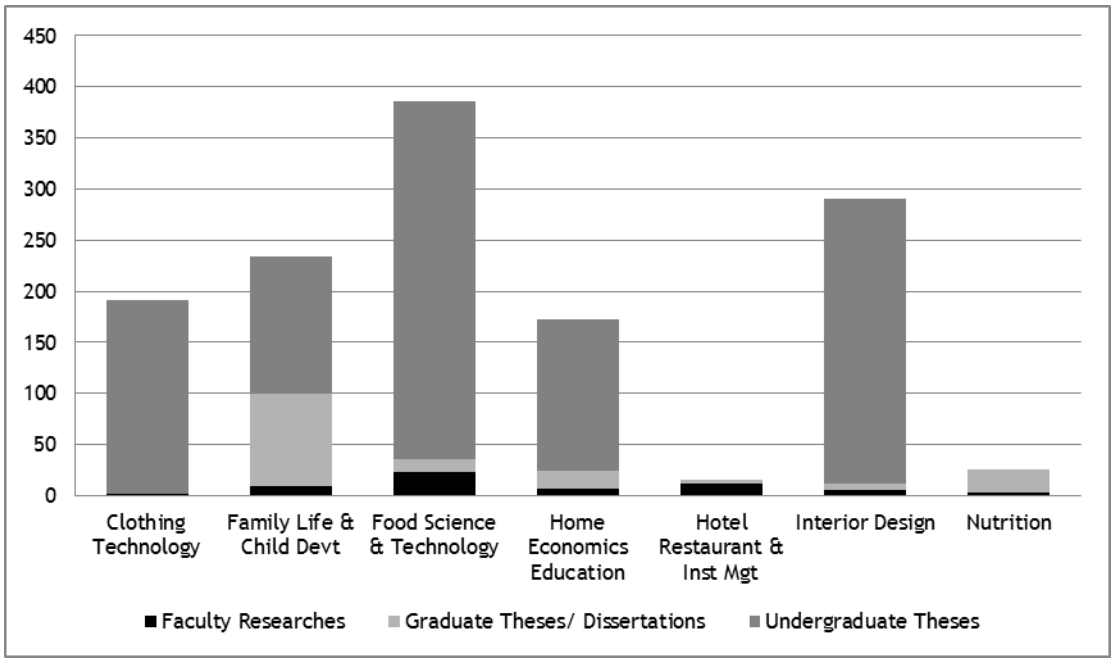


**Figure 2 Profile of studies reviewed by program and proponent 2003—2014/15**

**Clothing Technology (CT)** is the study of design, materials, equipment and processes for the production and distribution of clothing to meet the needs of individuals, families and institutions. It addresses the aesthetic, social, cultural, economics, managerial and environmental concerns in clothing. (CHE Catalogue, 2006—2010). Clothing Technology is the only sub-discipline in the College that does not have a graduate program, but it requires all its undergraduate students to undertake a thesis on a topic of their own choice as a final requirement before they graduate. The ten different themes that emerged from the 191 CT studies surveyed were: merchandising, fashion and design, production of apparel, textile production and weaving, accessories, clothing care and management, gender, culture, design for special needs, and practice of the profession and curriculum development. When themes of the students' theses were divided into the first half and second half of the 12-year span, it may be observed that there was a distinct drop in interest in the production of apparel and accessories, where the latter was already actually low in frequency during the first half. The apparent increase in interest amongst the undergraduate students in the second half was on culture and on the design of clothing for special needs. Special clothing needs studies included those on children with autism spectrum disorder, Down syndrome, cerebral palsy; women who are obese, pregnant, breastfeeding; students with scoliosis and the elderly population. Studies in CT were mainly phenomenological and qualitative in nature (see Table 2).

**Table 2 Themes in Clothing Technology studies by proponent (2003—2014/15)**

| Themes | Faculty | Undergraduate | | Total | % |
|---|---|---|---|---|---|
| | | 2003—08 | 2009—14/15 | | |
| Merchandising | - | 25 | 37 | 62 | 32.5 |
| Design / Fashion | - | 11 | 11 | 22 | 11.5 |
| Production of Apparel | - | 17 | 10 | 27 | 14.1 |
| Textile Production / Weaving | - | 8 | 9 | 17 | 8.9 |
| Accessories | - | 2 | 0 | 2 | 1 |
| Clothing Care & Management | - | 5 | 6 | 11 | 5.8 |
| Gender | - | 5 | 6 | 11 | 5.8 |
| Culture | - | 2 | 10 | 12 | 6.3 |
| Design for Special Needs | - | 1 | 8 | 9 | 4.7 |
| Curriculum/Professional Practice | 2 | 7 | 9 | 18 | 9.4 |
| **Total** | **2** | **83** | **106** | **191** | **100** |

**Family Life and Child Development (FLCD)** is the study of the individual and collective development of family members and their relationships. It focuses on the interaction of family members as they address their materials and relational needs. The discipline takes into account issues and challenges facing families and societal developments, both local and global (CHE Catalogue, 2006—2010). The Master in FLCD (MFLCD) has two tracks students can choose from—the Comprehensive Exam track or the Thesis track. The thesis is, therefore, an option and is not undertaken by all MFLCD students. For the undergraduate program, Bachelor of Science in FLCD (BSFLCD), only started to require a thesis in 2004 and the first submission of undergraduate theses, therefore, was in 2008 (see Table 3).

**Table 3 Themes in the FLCD Research by proponent group**

| Themes | Faculty (2003—14/15) | Students | | Total | % |
|---|---|---|---|---|---|
| | | G (2003—14/15) | UG (2008—14/15) | | |
| Child Development | 1 | 20 | 17 | 38 | 16.2 |
| Early Childhood Education | 3 | 17 | 7 | 27 | 11.5 |
| Parenting | 2 | 19 | 26 | 47 | 20.1 |
| Husband-Wife Dyad | - | 9 | 4 | 13 | 5.6 |
| Sibling Positions, Relationships | - | - | 9 | 9 | 3.8 |
| Family Life Management | - | 3 | 8 | 11 | 4.7 |
| Adolescence | - | 6 | 43 | 49 | 20.9 |
| Young Adulthood | - | 1 | 7 | 8 | 3.4 |
| Middle Adulthood | - | 1 | 1 | 2 | 0.9 |
| Elderlyhood, Grandparenting | - | 3 | 8 | 11 | 4.7 |
| Families & Children in Special Circumstances, in Disasters | 1 | 3 | 3 | 7 | 3 |
| Gender, Culture, Society | - | 1 | 1 | 2 | 0.9 |
| Families, Sickness, Health and Nutrition of Individuals | 2 | 8 | - | 10 | 4.3 |
| **Total** | **9** | **91** | **134** | **234** | **100** |

There were thirteen themes identified in the survey of 234 FLCD studies. When scrutinised more closely, it may be observed that the age or generation to which a proponent group belongs to factors into their topics of interest. For example, graduate students and faculty study more topics on child development, early childhood education, parenting and the husband-wife dyad. The undergraduate students, on the other hand, are more interested in understanding themselves and/or their peers,

siblings and parents. Parenting is a theme that cuts across generations. The considerable number of studies undertaken on parenting and adolescence had themes on parenting young children and adolescents, single parenting, parenting in Overseas Filipino Workers' (OFW) families, gender identity sexual and sexuality, student life and career preparations amongst adolescents. Interests in grand-parenting and elderhood, on disasters, sickness and health in families are gaining their momentum. While many of the studies in FLCD are qualitative in nature, some use a combination of quantitative and qualitative approach in their studies.

**Food Science and Technology (FST).** Food Technology is the application of food science and related fields in post-harvest handling, processing, packaging, storage and distribution for the improvement of food security and well-being of individuals, families and institutions. It includes the social, cultural, economic, managerial and environmental aspects of food systems. (CHE Catalogue, 2006—2010). The Food Science definition adapted by the FST faculty from the Institute of Food Technologist:

- **Food Science** is a discipline in which the chemical, biological and physical sciences and engineering are used to study the nature of foods, the causes of deterioration, the principles underlying food processing and the improvement of foods for the consuming public.
- **Food Technology** is the sub-discipline of the undergraduate program, while Food Science is for the graduate programs.

The major themes that emerged from the studies in FST were those that may be regarded as the usual areas of the sub-discipline. In the order of their quantity, these were food microbiology and food safety, sensory evaluation, product development, quality control, shelf life and storage, packaging, public health, profession and curriculum development. Studies on microbiology and food safety that ranked the highest focused food safety, microbiology in product development and integrity and measuring efficacies and various treatments (see Table 4).

**Table 4 Themes in the Food Science and Technology Studies by proponent (2003—2014/15)**

| Themes | Faculty | Students | | Total | % |
|---|---|---|---|---|---|
| | | G | UG | | |
| **Food microbiology, food safety** | **5** | **7** | **105** | **117** | **30.3** |
| Microbiology & Food safety | 2 | 2 | 21 | 25 | |
| Microbiology & product devt/integrity | 1 | 1 | 33 | 35 | |
| Measuring efficacies of treatments | 2 | 1 | 22 | 25 | |
| Antimicrobial activities & treatments | - | - | 18 | 18 | |
| Microbial characteristics & functions | - | 3 | 11 | 14 | |
| **Sensory Evaluation** | **2** | **-** | **89** | **91** | **23.6** |
| Thermal Behavior | - | - | 29 | 29 | |
| Color: pigments, parameters | - | - | 9 | 9 | |
| Sensory & physiochemical properties | 1 | - | 39 | 40 | |
| Smell/Taste: aroma, rancidity, etc | 1 | - | 12 | 13 | |
| **Product Development** | **5** | **1** | **56** | **62** | **16.1** |
| Preservation of local produce | 2 | 1 | 22 | 25 | |
| For health & nutrition benefits | 2 | - | 21 | 23 | |
| For crisis, emergencies, calamities | 1 | - | 13 | 14 | |
| **Quality Control** | **1** | **2** | **52** | **55** | **14.2** |
| Shelf-life, Storage | - | - | 28 | 28 | 7.3 |
| Packaging | 1 | 2 | 21 | 24 | 6.2 |
| Public Health, food insecurity | 5 | - | - | 5 | 1.3 |
| Profession/Curriculum Devt | 4 | - | - | 4 | 1 |
| **Total** | **23** | **12** | **351** | **386** | **100** |

There were three major purposes identified in product development: for the preservation of local produce; for health and nutrition benefits, and for crisis, emergencies and calamities. These purposes may be regarded as indicators of responsiveness of the proponents to the challenges of the people, as well as a reflection of the values promoted by Home Economics such as efficiency, sustainability and accessibility. Public health was a new theme that emerged in the FST studies. While most of the studies were experimental in their approach, phenomenological studies have started to gain ground in the studies in FST.

**Home Economics Education (HEED)** is a field of study which integrates concepts, skills, principles and theories of different fundamental subjects of Home Economics namely: foods and nutrition, housing and interiors, clothing, crafts, family life and child development, for teaching and life application. (CHE Catalogue, 2006—2010). HEED emphasises skills in decision-making and household resource management, taking into consideration the interaction between the material and relational aspects of, as well as the use of science and technology in day-to-day living. Five major themes surfaced in the survey of studies from HEED: human development and family life, consumerism, resource management, roles and performance in household management, and entrepreneurship in the home front. Other themes from relatively fewer studies were on food safety, waste management, disaster risk management, health and nutrition in the school setting, and the Home Economics profession and curriculum development. Disaster risk management was a new theme that emerged more recently as a response to the grave effects brought about by storm surges, strong typhoons and colossal floods experienced by the country during the past decade (see Table 5).

**Table 5 Themes in Home Economics Education Research (2003—2014/15)**

| Themes | Faculty | Students | | Total | % |
|---|---|---|---|---|---|
| | | G | UG | | |
| Human Development and Family Life | 1 | 3 | 50 | 54 | 31.2 |
| Consumerism | - | 1 | 39 | 40 | 23.1 |
| Resource Management | - | 5 | 29 | 34 | 19.7 |
| Household Management and Roles | 1 | 1 | 10 | 12 | 6.9 |
| Entrepreneurship in the Home front | 1 | 3 | 8 | 12 | 6.9 |
| Food Safety | - | - | 3 | 3 | 1.7 |
| Waste Management | 1 | 1 | 2 | 4 | 2.3 |
| Disaster Risk Management | 1 | - | 1 | 2 | 1.2 |
| Health and Nutrition in School Setting | - | 2 | - | 2 | 1.2 |
| Profession and Curriculum Development | 2 | 1 | 7 | 10 | 5.8 |
| **Total** | **7** | **17** | **149** | **173** | **100** |

**Hotel Restaurant and Institution Management (HRIM)** is concerned with the provision of food and accommodation services to individuals, families and groups away from home. It integrates and utilises knowledge from the areas of Home Economics, business and related fields of study. It includes the managerial, economic, social, cultural, environmental, health and aesthetic aspects of hospitality service. (CHE Catalogue, 2006—2010). Reported studies from the HRIM are the fewest across the seven sub-disciplines. The most probable explanation for this is that thesis is not required in its undergraduate BSHRIM program. The six themes that surfaced in the HRIM studies were quality of service, food quality and food preferences, food and culture, food service innovations, waste management, the HRIM profession and curriculum development. Even though the curriculum of HRIM has subjects on accounting and finance, it may be observed from the list of themes, the absence of any topic directly related to finance or profit. The themes focused instead on preferences of end-users, culture and waste management (see Table 6).

**Table 6 Themes in the HRIM Research by proponent (2003—2014/15)**

| Themes | Faculty | Graduate Students | Total | % |
|---|---|---|---|---|
| Quality of Service | 3 | 2 | 5 | 31.3 |
| Health, Food Quality & Preferences | 2 | 1 | 3 | 18.7 |
| Food and Culture | 2 | - | 2 | 12.5 |
| Food Service Innovations | - | 1 | 1 | 6.3 |
| Waste Management | 2 | - | 2 | 12.5 |
| Profession and Curriculum Development | 3 | - | 3 | 18.7 |
| **Total** | **12** | **4** | **16** | **100** |

**Interior Design (ID)** is the shaping and treatment of space to meet the needs of individuals, families and institutions. It considers functional, aesthetic, socio-economic, cultural and environmental aspects of daily living. (CHE Catalogue, 2006—2010) The Interior Design in the University of the Philippines is the only one in the country that is offered in the College of Home Economics. The program is under the College of Architecture in other Universities. The program also prides itself for having topped the last board exam (2014) with five occupying the top ten and with a 100% passing rate (see Table 7).

**Table 7 Themes in the Interior Design research by proponent sector**

| Themes | Faculty (2003—14/15) | Students | | Total | % |
|---|---|---|---|---|---|
| | | G (2004—14/15) | UG(2005—14/15) | | |
| Home and Family Life | 2 | 2 | 77 | 81 | 27.9 |
| Adapting & utilizing spaces | - | - | 16 | | |
| Values, culture, tradition, religion | - | 2 | 16 | | |
| Middle-income families' housing | - | - | 17 | | |
| Developmental and special needs | - | - | 15 | | |
| Low-income families' housing | - | - | 5 | | |
| Disaster, security-related concerns | - | - | 5 | | |
| Institutional homes | - | - | 3 | | |
| Shopping Malls, Stores, Restaurants | - | - | 52 | 52 | 17.9 |
| Classroom, Academic Environment | 1 | 1 | 36 | 38 | 13.1 |
| Professional Practice, Tools | - | - | 23 | 23 | 7.9 |
| Office, Work Environment | - | - | 20 | 20 | 6.9 |
| University dormitories, boarding houses | - | 1 | 17 | 18 | 6.2 |
| Church, religion and interiors | 1 | 1 | 17 | 19 | 6.6 |
| Hospital (public health) | - | - | 4 | 4 | 1.4 |
| Culture | 2 | - | - | 2 | 0.7 |
| Profession, Curriculum Development | - | 1 | 32 | 33 | 11.4 |
| **Total** | **6** | **6** | **278** | **290** | **100** |

The main themes that emerged from the ID studies were home and family life (27.9%), shopping malls, stores, restaurants (17.9%), classroom and academic environment (13.1%). The other themes were on professional practice and tools, office and work environment, university dormitories and boarding houses, church, religion and interiors, hospital, culture, profession and curriculum development. Topics under home and family life such as adapting and utilising spaces, values and culture, low and middle-income families' homes, designing homes for individuals with special needs, and disaster and security-related needs in the home, reveal values that are promoted in the ID program. There is a bias for the preservation of culture and tradition and for catering to the disadvantaged and those with special needs.

**Nutrition (N).** Community Nutrition is the utilisation of knowledge in nutrition and related fields of study to promote the nutritional well-being of individuals and groups within the framework of family and community life. It includes promotive, preventive, therapeutic and rehabilitative aspects of the delivery of nutritional services and embraces both dietetics and public health nutrition. (CHE Catalogue, 2006—2010). Community Nutrition is the name of the program for the undergraduate as Nutrition is at the graduate level. The Bachelor of Science in Community Nutrition does not have a thesis requirement (see Table 8).

**Table 8 Themes in Nutrition research by proponent sector (2003—2014/15)**

| Themes | Faculty | Graduate Students | Total | % |
|---|---|---|---|---|
| Nutrition Supplement | - | 8 | 8 | 32 |
| Food and Diet | 1 | 6 | 7 | 28 |
| Public and Family Health | 1 | 4 | 5 | 20 |
| Mother and Child | | 2 | 2 | 8 |
| Food Safety | | 1 | 1 | 4 |
| Profession & Curriculum Development | 1 | 1 | 2 | 8 |
| **Total** | **3** | **22** | **25** | **100** |

Reported studies in Nutrition came from the faculty and the students from the graduate level. There were a total 25 studies in Nutrition where six themes surfaced: nutrition supplement, food and diet, public and family health, mother and child, food safety and professional practice and curriculum development. The first three highest in ranking were studies on nutrition supplement, food and diet, and public and family health. Other themes were on mother and child, food safety and profession and curriculum development.

## Synthesis and discussions

Each sub-discipline in the UPCHE, with their articulated definitions, has a distinct focus though inter-phasing with other sub-disciplines in many ways. The definitions clearly articulated a common thrust,—the concern for the well-being of individuals and families. While the studies touched on topics in the usual categories of the sub-disciplines, some delved into new areas or fresh issues. Examples of these are clothing requirements of plus size women and children with special needs for CT, homosexuality, grand-parenting and families of Overseas Filipino Workers (OFW) for FLCD, product development for crisis, emergencies and calamities for FST, entrepreneurship and disaster risk management for HEED, waste management and food service innovations for HRIM, designing low income families' houses and institutional homes for ID, and family health and food safety for nutrition. All these demonstrate the *responsiveness* and *relevance* of Home Economics and its various sub-disciplines to *contemporary living*.

There were themes observed to cut across the sub-disciplines. These were themes on families and individuals in special circumstances (CT, FLCD and ID); on culture (CT, FLCD, ID and N); on disasters (FLCD, FST, ID and HEED); and public health and sickness in individuals and families (across all sub-disciplines except CT). These are clear indicators of unified ethos and values of the sub-disciplines in UPCHE.

### On the research methodologies

There was a balance in the methodological approaches, that is, of experimental, phenomenological, quantitative and qualitative in the research surveyed. A closer look though would reveal that FST tends be positivist in its approach. When well-being, quality of life, sustainability and happiness are regarded as the new measures of true development, phenomenology may need to take its rightful place in the scientific community. Phenomenology gives high regard to people's actual experience and gives due respect to their perceptions. Heinillä (2012) has a rich discussion of this, where she regards phenomenology as an attitude and a way of keeping track of and sharing people's actual experiences—a most crucial approach in studying quality of life.

**Relevance** of the studies in terms of attending to happiness and well-being in the Philippine context is another quality that can be observed. With the backdrop of the twenty dimensions identified to be most important to the well-being of Filipinos in the study of Sycip et al. (2000), fifteen were covered in the studies: respect from family (FLCD), love of parents and siblings (FLCD & HEED), regular food (FST and N), house ownership (ID), security from crime (ID), long life (FLCD, HEED and N), love of children (CT, FLCD, HEED, ID, N), good marital relations (FLCD), being with children (FLCD), nutritious food (FST, HRIM and N), love of spouse (FLCD), regular water (HEED), clean surroundings (HEED, HRIM) and share in decision-making (FLCD, HEED).

These results could further be extended to the wider global community as discussions on the measure of national growth through GDP (quantitative) has expanded to well-being, happiness and sustainability (qualitative) during the 2011 UN General Assembly (Wiseman, 2012). Home Economics has a crucial role in this movement as the key indicators they have identified are precisely what the discipline of Home Economics promote. The four dimensions of the quality of life identified by Veenhoven (2013), that is, liveability of environment, life-ability of the person, utility of life and satisfaction, further validates the vital role Home Economics in developing policies and shaping the world in the 21st century.

Even as most of the sub-disciplines in the UPCHE, in its evolution together with the wider societal developments, have moved to the market and/or to industry, the studies demonstrated the centrality and the continuing relevance of the home and the family in attending to basic human needs, that is, food, shelter, clothing, nurture and intimacy. Furthermore, it is in the family where the thresholds of the human senses are developed; where minds, attitudes and lifestyles are shaped and transformed.

## Conclusion

This systematic study of over a thousand studies has empirically proven the relevance and significance of Home Economics as an academic discipline as it steers discussions in the academic and international community on what is important. The breadth and depth of the studies demonstrated the responsiveness of Home Economics to the current concerns of individuals and families, instilling hope and re-directing happiness, a new economic paradigm in determining growth and development among nations. The research has shown the centrality of home and family to strategically and ethically address these, even in the Philippine context—concerns that actually, are inherently, sensitively and profoundly studied in Home Economics.

## Disclosure statement

No potential conflict of interest was reported by the author.

## Acknowledgements

All abstracts of theses of graduate and undergraduate students of the U.P. College of Home Economics reviewed in this study are available at www.ilib.upd.edu.ph

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INTERNATIONAL FEDERATION FOR HOME ECONOMICS

RESEARCH ARTICLE

# A perfect storm or never say die: Home Economics education in British Columbia

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## Abstract

*This paper uses data gathered by the Teachers of Home Economics Specialist Association (THESA, 2011) with the assistance of the British Columbia Teachers' Federation (BCTF). The data suggest that factors in the province of British Columbia (BC) could have created a perfect storm to decimate Home Economics education. Despite overwhelming events such as the dismantling of tertiary level Home Economics programs and budget cuts to secondary school Home Economics (up to grade 12), Home Economics educators have consistently risen to the challenge of ensuring that education for everyday life and family living continues to be offered in BC. We attribute this to the "never say die" attitude of the community of BC Home Economics teachers, and describe their resolve as social resilience that makes them less vulnerable to factors that threaten the existence of their subject area. As a case study, this paper may provide insights for other jurisdictions facing similar circumstances and act as a point in time from which to discuss relevancy to contemporary educational events. The research project is described, and data from the project are analysed and discussed.*

**KEYWORDS: BRITISH COLUMBIA, HOME ECONOMICS TEACHERS, TRENDS IN HOME ECONOMICS EDUCATION**

## Part I A Perfect Storm

This section of this report uses data from research undertaken in BC over a two-year period ending in January 2010. The research involved an inquiry group of Home Economics teachers who were members of the Teachers of Home Economics Specialist Association (THESA), university personnel, and support staff from the British Columbia Teachers' Federation (BCTF) research branch. It will be referred to as the Home Economics Teacher Inquiry Project (HETIP). The research included an online survey of 240 Home Economics teachers from 41 school districts, a telephone survey of school district personnel officers; and interviews with a representative sample of Home Economics teacher (THESA, 2011); a literature review of local and global developments in Home Economics including current socio/political/cultural/economic data that provided a rationale for the support of Home Economics education (Smith & de Zwart, 2010). The purpose of the study was to understand the work of Home Economics teachers and the state of Home Economics education in the province. These multiple data provide a rich picture of the lives of Home Economics teachers and current issues and concerns that have implications for the future of the subject area.

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**Research model**

The consequences of dismantling and restructuring of tertiary Home Economics and Home Economics related programs, the Home Economics teacher shortage in the province and other policy decisions that have impacted Home Economics programs at all levels, for example the elimination of a Home Economics degree from the only university in the province thereby reducing the supply of Home Economics teachers, have been discussed at many Home Economics teachers' conferences, executive meetings, regional meetings, and department meetings since the mid-1990s (see for example, de Zwart, 2001). However, no systematic documentation had ever been gathered. The members of Teachers of Home Economics Specialist Association (THESA) frequently called for action, such as lobbying the provincial government or other organizations for support, but without empirical evidence to substantiate claims, executive members were reluctant to meet with ministries of education, health, and higher education or with faculties of education at universities within BC.

In the fall of 2007, the THESA president applied for a grant for a teacher inquiry project from the Research and Technology Division of the BCTF. For the past two decades, the BCTF has supported teacher inquiry as professional development in the belief that it builds teacher autonomy and teacher leadership and connects the BCTF to what teachers care about most—teaching and learning. Through the BCTF a number of Teacher inquiry groups have been created where several teachers collaborate and work together to do the research (see *The BCTF Teacher Inquiry Program*, n.d.). THESA's application was successful, and HETIG was formed. Invitations to join HETIG were extended to THESA executive, THESA members, and the Home Economics Education Coordinator in the Faculty of Education at the University of British Columbia (UBC). A group of eight was formed with the authors of this paper being two of the members. The inquiry group consisted of Home Economics teachers from throughout the province, executive members of THESA, one representative from the BCTF professional development branch, and one representative from the UBC teacher education program. The grant paid for teacher release, travel and accommodation for some face to face meetings. The BCTF research department also set up a PBWiki Site for ongoing communication, collaboration and discussion. After initial work by the group, the BCTF research department took responsibility for finalising, administering and analysing the survey instrument and preparing a final report.

**Research questions**

HETIG identified the following question as a central guiding question for the research project: What is it like to be a Home Economics teacher in the province?

Sub-questions were:

- What are the provincial trends in Home Economics education?
- What factors have influenced the current state of Home Economics in the province? (e.g., historical, political, social, cultural, economic)

**Theoretical framework**

This research drew its conceptual framework from two overlapping bodies of literature: action research and mixed methods. Teacher inquiry located in action research and mixed methods research offered the best opportunities to answer our research questions. Both methods of research are underpinned philosophically by pragmatism, was deemed the best methodological paradigm for this research as it holds the belief that ideas must be looked at in terms of their practical effects and consequences. The root of pragmatism is *pragma*, the same root as practice and practical. Pragmatists hold that either or both observable phenomena and subjective meanings can provide acceptable knowledge and that reality is both external and multiple (Pansiri, 2005).

The German-American psychologist Kurt Lewin (1890—1947) is often credited with originating the term *action research* which he viewed as a process that "gives credence to development of powers of reflective thought, discussion, decision and action by ordinary people participating in collective research on 'private troubles' that they have in common" (Adelman, 1993,as cited in Mills, 2003, p. 5). Action research has been advocated as a methodology for Home Economics (e.g., Peterat, 1997; Peterat & Smith, 2001; Sikora & Alexander, 2004) because it is so closely linked to practical action, the orientation of Home Economics. It resonates with the focus of Home Economics on daily life and hands-on experiential education and its roots in the progressive education movement and the work of John Dewey (Peterat & de Zwart, 1991).

"Mixed methods" implies using more than one method to gather evidence on the state of Home Economics education. Mixed methods research has been defined by Johnson and Onwuegbuzie (2004) as "the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study" (p. 17).

Figure 1, based on Johnson and Onwuegbuzie (2004) outlines the research design. The research involved collecting data from a variety of sources such as records (enrolment figures, historical records, literature); using survey research (online survey of 240 Home Economics teachers from 41 school districts), and gathering qualitative data (open ended questions, telephone surveys, interviews). These data were then analysed and interpreted and summarised and transformed into graphs, timelines, a literature review, and contextualised material. The quantitative data were statistically analysed by the technical research team of the BCTF. The qualitative data were discussed by the research group at face to face meetings where members worked to explain, give meaning to and generally make sense of the data, teasing out themes related to the research questions. This involved making assertions about the statistical data and coding the qualitative data to find patterns and meaning. The results were then synthesised into two final reports (Smith & de Zwart, 2010; THESA, 2011). For the purposes of this paper, we use the information available in those two final reports to discuss the research questions.

## Results

### What is it like to be a Home Economics teacher in British Columbia?

From the information obtained during HETIP it was possible to create a portrait of what it is like to be a Home Economics teacher in BC and how Home Economics teachers differed from and were similar to other groups of teachers. The research group categorised the data according to these themes: demographics; policy decisions; teacher shortages; and demands of the work.

### Demographic data: Female, older, well educated, experienced

The survey revealed that the typical Home Economics teacher in 2010 was female, 45—54 years old, who had been teaching more than 10 years, with a full time continuing contract, who was content with her current teaching assignment, who would probably retire within ten years (35% of respondents plan to retire within 5 years while 46% of respondents plan to retire within 8 years), who was well educated with a Home Economics major and often graduate level studies, and who participated in Home Economics related professional development (THESA, 2011).

### Discussion of demographic data

Home Economics continues to be a female dominated field. Retirement is a looming issue. Almost half of the teachers of Home Economics who responded to this survey expected to finish their teaching career by 2017. The number of respondents to the survey with over 20 years of experience was double the provincial average of teachers in general. The combination of age and experience is a concern, as substantially more Home Economics teachers may be closer to retirement than most teachers in the BC school system, and replacing these experienced teachers may become problematic. There was concern that many teachers new to Home Economics have less pre-service education directly linked to Home Economics. Other teachers have no pre-service Home Economics education and are transitioning from teaching other subject areas. They may lack mentors to guide their professional development. This also points to the need for Home Economics education programs at higher levels such as university certificate/diploma program, masters' and doctorate degree.

In general, the data from this survey give a picture of Home Economics teachers who are ageing, and not being replaced by teachers with the same professional background. This brings up concerns about the future of Home Economics programs (if the teachers are not replaced) and the integrity of the courses offered (if they are delivered in a watered-down fashion by teachers who are not qualified in Home Economics). Additionally, the gendered nature of the profession has not changed, and progress has not been made in attracting and retaining males in the profession.

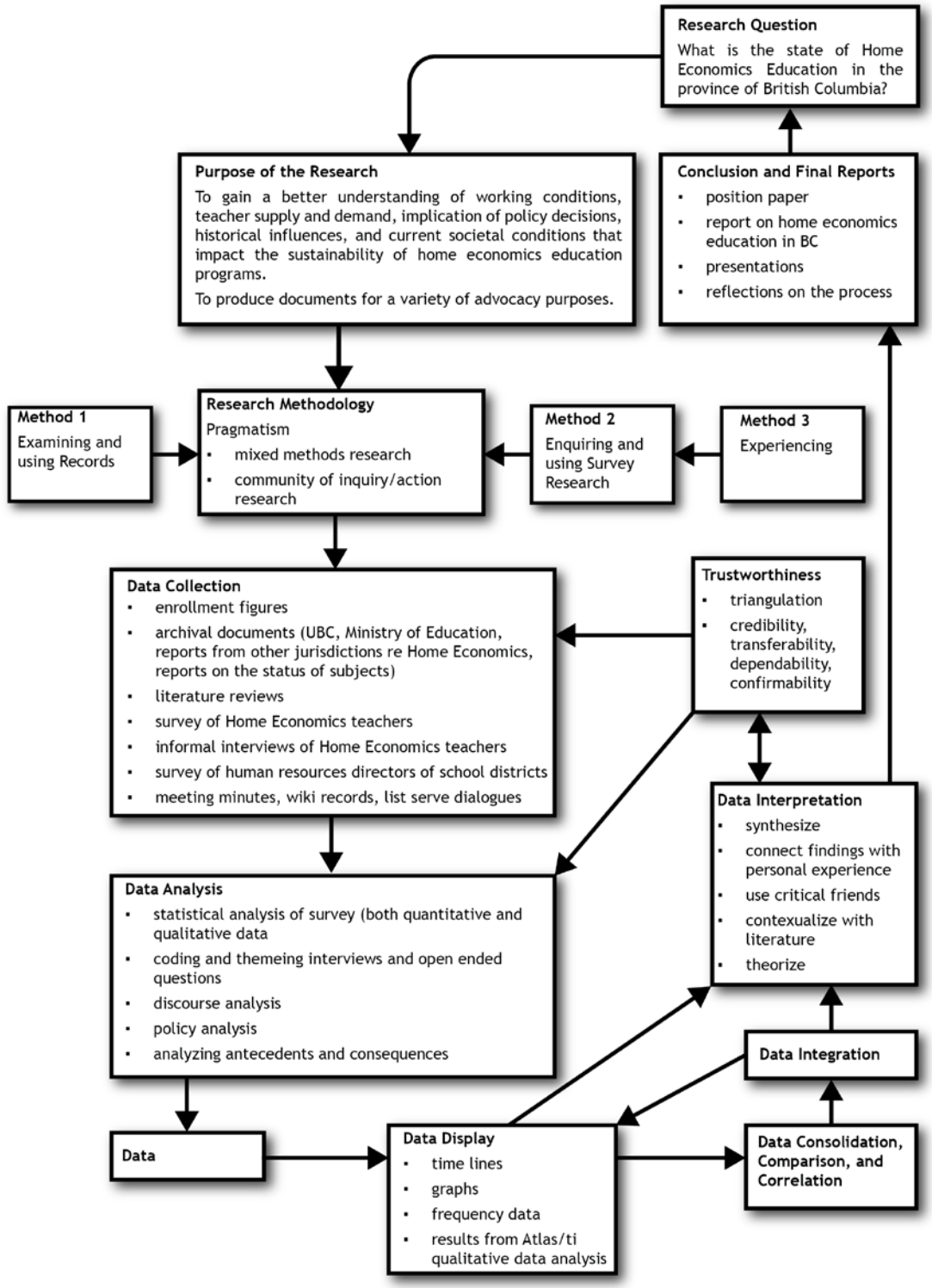


**Figure 1** **Home Economics Teacher Inquiry Project (HETIP)**

## Policy Decisions

Education is a provincial responsibility in Canada. BC provincial education policy decisions (and one legal decision) have required Home Economics teachers to respond constantly to changes that have influenced enrollment in their courses and workplace conditions.

The timeline in Table 1 outlines the impact of policy decisions and one legal decision made by Ministry of Education over the past twenty-five years that have impacted Home Economics programs in the province.

**Table 1 Implications of policy decisions taken by the BC Ministry of Education**

| Date | Ministry of Education | What Happened | Implications |
|---|---|---|---|
| 1988 | Report of the Royal Commission on Education (Sullivan, 1988), A Legacy for Learners. Recommended a broad liberal general education for K to 10. Home Economics was part of the common curriculum. | Enthusiastic response by home economics community as it recognised the importance of the subject.<br>Increased opportunities to expand to the elementary level. | An elementary curriculum document was created but never approved by the Ministry of Education. The grade 8 to 12 curriculum revision took 10 years from 1988 to 1998 (BC Ministry of Education, 1998) to be finalised for implementation. |
| 1995 | Graduation requirements changed to include 2-credits of Applied Skills and 2-credits Fine Arts mandatory. (BC Ministry of Education, 1995). | Home Economics courses qualify as Applied Skills | Home Economics benefited as it rose in status from being just an elective to be mandatory. But, this required teachers to develop 2 credit courses (all existing courses were 4 credits). |
| 1997 | A Health course called Career and Personal Planning [CAPP] K-12 was mandated for all students. (BC Ministry of Education, 1997) | Removed one elective from students' timetables.<br>Reduced opportunities for students to elect Home Economics courses. | Some CAPP content overlapped with Family Studies and Food Studies lowering the demand for those courses. Some home economics teachers moved to teaching CAPP |
| 1998 | New Home Economics curriculum released (BC Ministry of Education, 1998). | "There are no prerequisites for entry to any home economics course at any level in grades 8 to 12." (p. 4). | Removal of prerequisites for secondary courses meant that classes often had a huge range of abilities and experience levels, with the teacher having to adapt or modify programs for a large percentage of the class. |
| 2001 | New provincial government enacts Bill 18 declares education and health care "essential services" (BCPSEA, 2010). | Removed the right to strike. Funding for health care and education was tightened. | Some home economics budgets were frozen or even reduced. |
| 2002 | Government enacts Bill 27, Education Services Collective Agreement and Bill 28, Public Education Flexibility and Choice Act (BCPSEA, 2010). | Instituted province wide bargaining, and stripped all class-size and composition limits from contracts (BCTF, n.d.). | Larger classes presented safety and pedagogical concerns for home economics teachers. |
| 2003 | Government enacts Bill 51, the Teaching Profession Amendment Act (BCCT, 2004)<br>Government takes over the College of Teachers and establishes the Ministry of Education Teacher Regulation Branch. | New standards of competence and conduct of educators includes Standard 6. "Educators have a broad knowledge base and understand the subject areas they teach. Educators understand the curricular, conceptual and methodological foundations of education and of the subject areas they teach" | Without a home economics degree available in BC, concern increased about how home economics teachers could obtain sufficient background knowledge in the subject area. |
| 2004 | New graduation requirements. Only 2 credits in either AS or FA required for graduation. | | Potential decrease in student enrollment in four-credit senior home economics courses was foreseen. |
| 2006 | Lawsuit won by John Young, Victoria School Trustee, about inequity and inequality of school fees results in provincial prohibition against charging school fees (BCTF, n.d.). | Ministry of Education indicates that no extra funding is available to cover the loss of fees. | Many schools depended on fees to maintain programs (particularly foods), and some programs were modified to reduce "hands-on" practical activities because there was not enough money to buy supplies. |
| 2006 | Bill 33 limits class size to 30 and no more than 3 students with IEP's (BCTF, n.d.). | No extra funding to implement these limits. | Continued concern about safety and learning conditions especially in home economics classrooms that were built for 24. |
| 2007 | Planning 10, a new mandatory four-credit course for Grade 10 students was instituted (British Columbia Ministry of Education, Skills, and Training, 2007). | Removed one elective from students timetables<br>Reduced opportunities for students to elect Home Economics courses. | Some home economics teachers moved to teaching Planning 10 |
| 2012 | Bill 22, enacted by the government, blocked teachers from negotiating class size and composition. (BCTF, n.d.). | Reinforced the removal of class size and composition limits from contracts. | Larger classes continued to present safety and pedagogical concerns for home economics teachers. |

In addition to policy decisions at the ministry of education level, Home Economics teachers have been faced with policy decisions at the university level as well. The School of Family and Nutritional Sciences that housed the Home Economics program at the UBC was dismantled, and the last Home Economics degree was conferred in 2002. The Faculty of Education continues to accept students in Home Economics education, but the prospective students have to cobble together courses in Home Economic-related fields in order to gain entry and enrollment numbers have been dwindling. In March of 2007, the Dean of Education at UBC arbitrarily closed the Home Economics Education program one week before the application deadline. This could easily have ended the Home Economics program at UBC and ended the supply of Home Economics teachers. It would have gone unnoticed if a prospective registrant had not alerted her former Home Economics teacher who emailed three or four of her colleagues and wrote a letter of complaint to the Dean. The provincial Teachers of Home Economics Specialist Association [THESA] was informed, but the THESA executive weren't immediately able to respond. In the meantime, a grassroots-generated protest was organised through an email list serve of about 300 Home Economics teachers in the province of British Columbia. Teachers sent emails, wrote letters to the UBC Dean of Education, the President and Provost of the University, British Columbia Teachers' Federation officials, appeared on provincial radio shows, wrote to newspapers and members of the provincial legislature, and contacted principals, students, parents and school boards. The program was re-instated.

**Discussion arising from policy decisions**

The survey documented the ways Home Economics teachers have had to modify their programs in response to these policy decisions. Home economics teachers expressed concern regarding developing and implementing a quality program with less financial support, increased diversity in class composition, classroom overcrowding and coping with the stress this policy decision had created.

Almost half of the teachers reported that the number of English as a Second Language (ESL) students in their classes had increased, 68% reported increased numbers of students with Individual Education Plans (IEPs) and 61% indicated increases in class sizes. More than 60% *strongly agreed* or *agreed* with the following statements:

- I have changed my Home Economics curriculum because of the cost of supplies has increased
- I have changed my Home Economics curriculum because of the decision not to charge fees
- My program has changed because prerequisites were removed.

This was elaborated with comments such as:

> I am getting very tired/frustrated with budget cuts, increasing enrollment of special needs, LD [Learning Disabled] and ESL kids without support for them.

Less financial support from government funding cutbacks and the inability to charge fees for consumable supplies had implications for the practical hands-on learning that typically occurs in Home Economics. Many Home Economics teachers had to change the curriculum of their programs because the cost of supplies was no longer sustainable. Teachers said:

> Budget cuts are greatly impacting Home Economics. [Having] fewer labs save money but I believe that lab work is where some important learning occurs. Equipment breaks down and there is no money to replace it. The elimination of student fees is one more blow to these programs.

The removal of class size regulation was another blow to Home Economics programs. In the past, most Home Economics classrooms in the province had been built to hold 24 students and previously the teaching contract contained language that ensured that the maximum size for Home Economics classes would be 24. There had also been a limit to the number of students designated as ESL or with IEPs. Larger classes with increased diversity raised issues of safety, classroom management and unsuitable learning environment. For example, teachers wrote:

> Student safety is also a concern because of the numbers of students in the classroom and too many needy students without enough support.

> Class size. Too many students!! The students are literally sitting on top of each other. I cannot walk between the tables because there is no room....and I'm a petite person.
>
> Large class sizes result in little help from the teacher. When there is only one teacher in a huge class, students get frustrated and impatient when they can't get the one-on-one help that they need.

The removal of prerequisites meant students could enrol in any course at any grade level with no prior knowledge of the subject area. For example, a student could enrol in Foods Studies 12 or Textile Studies 12 with no previous experience or lower level study in the area. This made teaching Home Economics very challenging; one teacher expressed it this way:

> I am also frustrated by the "no prerequisite" ruling. This makes for "watered down" courses and cheats the students of time and techniques who have fulfilled the previously required prerequisite courses.

The removal of prerequisites for secondary courses also meant that classes often have a huge range of abilities and experience levels, with the teacher having to adapt or modify programs for a large percentage of the class requiring extra planning and additional stress. The academic integrity of programs was often compromised as teachers could not assume a common level of background knowledge or competence.

All of these policy decisions have contributed to teacher stress and burn out. The policy decisions at the university level had implications for the supply of Home Economics teachers that are discussed next.

**The shortage of Home Economics qualified teachers and teachers on call**

The problem of the declining supply of Home Economics teachers is a worldwide phenomenon. Over the last twenty years, this has been reported by scholarly papers in the United States (Werhan & Way, 2006), Australia (HEIA, 2000), the Sudan (Shommo, 1995), Botswana (Bennell & Molwane, 2007), and Canada (Grimmett & Echols, 2000, 2001; Smith & Dryden, 2005). It has been acknowledged in the popular media in the United States (Maldonado, 2008; Zehr, 1998), Scotland (Schofield, 2005), New Zealand (TVNZ, 2007), and Estonia, Latvia, and Lithuania (Lamber, 1999). British Columbia is no different. Close to 90% of the BC Home Economics teachers surveyed *strongly agreed* or *agreed* with the statement:

- My school/workplace has experienced difficulties finding Teachers on Call (TOCs, also known as substitute teachers or supply teachers) who have Home Economics qualifications.

Two-thirds also *strongly agreed* or *agreed* with:

- My school/workplace has experienced difficulties in getting qualified Home Economics Teachers to fill staff vacancies.

The following comment sums it up.

> Definitely a shortage of trained home ec teachers for jobs and TOCs [teachers on call]. I get emails all the time asking if I know any home ec teacher that can do long-term subbing or a mat leave or even for a job. The home ec TOC list is very sparse and most of the home ec teachers will prep as if there is no home ec TOC to prevent chaos and safety concerns. Students even complain about the lack of home ec TOCs.

In telephone and direct interviews conducted during this study, several district human resource personnel reported difficulty in filling vacant positions with Home Economics qualified specialists. One comment from a Human Resources Director is shared below:

> We aren't anticipating a shortage—it's already here!

Of the teachers participating in the survey, thirty percent indicated that they had no Home Economics specialisation in their teacher training.

**Discussion of Home Economics teacher shortage**

In most districts when a Home Economics-educated teacher is not available, the position is filled by a teacher without Home Economics qualifications. The data appeared to indicate that almost one-third of the people teaching Home Economics did not have a pre-service education that included Home Economics subjects. This is a direct result of the dissolution of the only BC university program that offered a Home Economics degree. Coupled with the provincial education requirement where an undergraduate degree in a teachable subject is followed by a Bachelor Education degree in order to become a qualified teacher (Home Economics or other), the route to becoming a Home Economics teacher was effectively blocked. Since that time potential Home Economics teachers have had to put together Home Economics-related degrees in Arts or Science faculties. But only the most determined are doing this, and the numbers entering Home Economics education have been declining. They were so low in 2007 that the Dean of Education arbitrarily and without consultation cancelled the program. This happened about the same time as the only tenure-tracked Home Economics professor in the Faculty of Education retired. The decision was later rescinded, but the damage was done. Even now many people still think the Home Economics education program has been eliminated. From 2007 to 2014 the coordination of the Home Economics teacher education program was done by sessional lecturers and seconded teachers.

Often Home Economics teachers are reluctant to stay home when they are sick because no Home Economics qualified TOCs are available to replace them. They also constantly mentor non-Home Economics educated teachers who are assigned to teach Home Economics. This can be a frustrating experience as time has to be spent with the mentees, who may well leave the subject area as soon as an opening comes available in the areas for which they are qualified. Home Economics teachers responding to the survey expressed their frustration this way:

> Home Economics programs have been fractured between numerous post-secondary schools and faculties. There is no clear path to becoming a Home Ec. teacher.
>
> There are disjointed university course offerings here and there—was lucky to have my degree from the OLD School of Home Economics at UBC!
>
> 34 years has done nothing to change the shortfall in qualified Home Ec teachers. I have become an endangered species!

**Working twice as hard outside the classroom**

Home economics teachers work in classrooms that are not the norm. The teaching spaces are specialised rooms resourced for lab-based teaching and learning. The teacher is responsible for ensuring all equipment is maintained and in good working order, and also must regularly replenish the consumable supplies used in the labs. For teachers in foods labs, this means preparing market orders and often doing the grocery shopping and transporting the supplies themselves, at least once a week and unpacking and storing the items. Depending on storage capabilities in the facility, daily shopping is sometimes required. Work in a textiles lab also requires shopping for resources, but it is limited to a few times a term. Mostly, this shopping is done out of school hours. The additional time over and above teaching averaged 13.15 hours per week. When asked about this aspect of their work, only 4% of teachers said that they have a paid assistant to help with the work. Many made comments such as:

> Be prepared to be very organised and willing to do more than just teaching. Grocery shop(ping), cater(ing), and look(ing) for innovative ways to make ends meet with your budget.
>
> The shopping and constant cleaning, replacing equipment, evaluating, is so time-consuming and class size at 30 is too large.
>
> The cost of materials is steadily climbing, but budgets are relatively static meaning less hands-on experiences for students. I spend a great deal of time finding community partnerships to stretch my budget, that is, catering for PAC [Parent Advisory Council] events, making salsa for the hot lunch program, donations of fruit/vegetables from local gardens, donations of material…

**Discussion of working twice as hard outside the classroom**

A recent study by the BCTF found that the average teacher spends 6.63 hours per week outside of school preparing for their classes (Naylor & Malcolmson, 2003). On average, Home Economics teachers spend an additional 6.5 hours per week, over and above what is normally done by teachers. This is a disproportionately large amount of time per week, double the amount of an average teacher.

Stress is a main concern linked to the work-related tasks done by Home Economics teachers outside the classroom. Other concerns include wear and tear on teachers' own vehicles, not being reimbursed for mileage, and no Workers' Compensation coverage should anything happen to them because they are not officially at work. The burden of acquiring daily supplies often contributes to Home Economics teachers either leaving the profession altogether or choosing to teach other subjects that are less time demanding.

> I am finding that teaching Home Economics is exhausting. It requires a great amount of energy, not only teaching the classes but also ensuring the groceries are on hand and trying to stay within the budget. There are many challenges in this area and I certainly understand why some Home Economics teachers choose to move on to other areas after time spent in this one.

**Summary Part 1 A Perfect Storm**

For this section of the paper, we used *A Perfect Storm* from the book by Sebastian Junger (1997) that inspired the movie of the same name. The *perfect storm* was defined as a tempest that may happen only once in a century, a storm created by so rare a combination of factors that it could not possibly have been worse. The term has come to mean any combination of negative events of patterns that exacerbate a situation. We use it here to explain the events that under normal circumstance would indicate the impending demise of Home Economics programs.: the UBC School of Family and Nutritional Sciences disbanded; Home Economics Bachelor Degree discontinued; tenure track position in Home Economics Education not filled; attempt by Dean of Education to close Home Economics teacher education program; candidates for Home Economics teacher education programs having difficulty acquiring the requisite background knowledge and skills; Home Economics teacher shortage; budget shortfalls that impacted programs; Ministry of Education removing class size limitations and requirements for pre-requisites; and a legal decision forcing cancellation of course fees.

So what does it mean to be a Home Economics teacher in this province? Home economics teachers are: female, older, well educated, and experienced; constantly responding to policy decisions that have negatively impacted their programs and working conditions (e.g., class size and composition; ability to collect fees for consumables; no course prerequisites); concerned about the lack of qualified Home Economics teachers and TOCs; constantly mentoring non-Home Economics teachers who are assigned to teach Home Economics; and working six hours a week more than the average teacher in order to obtain supplies and maintain equipment and do other tasks that are subject specific. Teachers made the following comments about issues in Home Economics:

> Class sizes, budget cuts, increasing costs, increase stress is going to cause "good" teachers to leave or "burn out".

> The teaching situation in Home Economics classes has become untenable.

## Part II Never Say Die

The factors described in Part I make the future of Home Economics in this province look dismal, but despite this gloomy data, Home Economics programs in most schools are thriving (Smith & de Zwart, 2010). To explain this, we returned to the survey data, and a number of actions have been taken since then to turn the situation around. We use the expression, "never say die", and the concept of social resilience to discuss these findings. The word *resilience* comes from a French verb meaning *to rebound*. In modern terms, it has come to mean the capacity to deal with change and continue to develop (Online Etymological dictionary, n.d.). "Social resilience concerns social entities—be they individuals, organisations or communities—and their abilities or capacities to tolerate, absorb, cope with and adjust to environmental and social threats of various kinds" (Keck & Sakdapolrak, 2013, p. 8). Resilience in societies is crucial in maintaining options for future human development. How have

Home Economics educators been able to withstand the shocks, and anticipate and plan for the future? What sustains Home Economics teachers? What actions can sustain Home Economics programs?

**Passionate about Home Economics and students.**

The first section of this paper focused on trying conditions for Home Economics teachers. Yet 72% of the Home Economics teachers responding to the survey indicated that they were not considering leaving Home Economics for other teaching areas.

Despite working twice as hard as the average teacher and constantly juggling course content due to policy decisions on class size, fees, prerequisites and the like, the group of Home Economics teachers who responded to this survey appear to be individuals who believe in the relevance of their subject area and frequently used the word *love* to describe their work.

> I can teach a subject area that I love, teaching an important life skill gives satisfaction—students that don't excel in academics have great success in home and so on
>
> I love to see my students becoming more independent and ready to leave school prepared to handle the simple life skills of preparing nutritional meals for themselves and creating clothing that is functional and fashionable as well as become a more discerning consumer.
>
> The only reason I'm teaching Home Ec is because I don't want it to die out (oh and I do love it)…

The love they have for the subject area is the kind of love that helps Home Economics teachers resist the temptation to fall into despair. The survey respondents indicated that they teach the subject area because they find it personally and professionally rewarding to teach something they are passionate about. They derive pleasure and satisfaction from teaching Home Economics. Teachers wrote about the rewards of Home Economics classroom:

> After many years the most rewarding part is seeing the look on a student's face when they achieve something they did not think they were capable of doing.
>
> What a privilege it is to teach in a subject area where parents are always grateful that you are teaching their child such valuable life skills.
>
> I love watching my students prepare meals for themselves. I have had students come back from university and tell me they learned to cook in my class.

When people are passionate, they take action to protect and advance their cause.

**From reactive to proactive**

Since the shock of 2007, sessional and seconded instructors with the support of THESA, a new Dean and Department Head in the Faculty of Education at UBC have been able to strengthen the program. With the cooperation of the Department of Professional Development and Community Engagement [PDCE] (the outreach arm of the Faculty of Education), an existing ten-course Home Economics diploma program was strengthened with the addition of five online courses. This enabled teachers throughout BC and other parts of Canada to upgrade their Home Economics knowledge through distance learning. The success of these courses inspired the sessional and seconded instructor to propose an online Master of Education program that was approved by the Faculty of Graduate Studies. To date (January, 2017) thirty-three students from across Canada have earned their Master of Education in Home Economics Education. Up to 150 teachers have enrolled in the Home Economics diploma since 2008 (the number of completions is difficult to determine since teachers have five years to complete the program). The success of these initiatives led to the hiring of a tenure tracked professor in Home Economics education which has given the program greater stability.

Since 2002, the BCTF has been fighting in the courts the BC government's decision to eliminate class size and composition restrictions [provincially-legislated Bills 28 and 22]. All Home Economics teachers are members of the BCTF and the information gained by the HETIG inquiry group indicates

how education was compromised by these decisions. It took 15 years and a series of legal challenges and appeals for the case to be brought to the Supreme Court of Canada in 2016. The Supreme Court ruled that Bills 28 and 22 were unconstitutional ("Victory at the Supreme Court of Canada", 2017). This was a landmark decision requiring the provincial government to rescind those Bills and adequately fund education in BC. Many of the concerns expressed by Home Economics teachers in this study related to class size and compositions will now be addressed.

#### Discussion of Part II Never Say Die

Keck and Sakdapolrak (2013) determined that social resilience is comprised of three dimensions: coping capacities; adaptive capacities; and transformative capacities. The Home Economics teachers in this study provide examples of all three of these capacities. They coped with and adjusted their teaching so that they could maintain and even increase the enrollment in Home Economics programs despite a general decline in school enrollments. They took action that prevented the Home Economics teacher education from being cancelled. They supported the transformation of the diploma and masters programs at UBC. As members of the BCTF they supported the Supreme Court challenge to legislation regarding class size and composition. In general, they fostered developments that would sustain Home Economic education in the province.

## Concluding comments

We have used the metaphor of a *perfect storm* to explore the socio/political/cultural/economic events that have impacted Home Economics programs in the province. Despite events that frequently seemed overwhelming, Home Economics educators consistently rose to the challenge of ensuring that education for everyday life and family living continues to be offered in the province. Home economics education in British Columbia has a "stormy" history, but this research shows the social resiliency of the Home Economics education community. As demonstrated, the Home Economics community in BC refused to say "die". It took intentional action to enhance the personal and collective capacity of its members and institutions to respond to and influence the course of change. Perhaps others in similar circumstances will benefit from our experience.

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