

IJHE

ISSN 1999-561X

International Journal of Home Economics

Volume 3 Issue 2 2010



IFHE is an international Non Governmental Organisation (INGO) in consultative status with the United Nations (ECOSOC, FAO, UNESCO, UNICEF) and with the Council of Europe

**INTERNATIONAL FEDERATION
FOR HOME ECONOMICS**

This refereed journal is an official publication of the International Federation for Home Economics. Electronic access via IFHE website for subscribers and members only: www.ifhe.org

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ISSN 1999-561X

International Journal of Home Economics

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The International Journal of Home Economics gratefully acknowledges the assistance and support of the Griffith Institute for Educational Research.

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Issue 2, 2010

Dear colleagues

Since I wrote the last editorial, many lives, many homes, many families, many communities have been impacted by natural disasters. It seems lately that there have been many more natural disasters and extreme weather events than usual. For example, recently: New Zealand's city of Christchurch was devastated by an earthquake; Chile too suffered; the US experienced extreme blizzards; Brazil, Pakistan & South Africa flooding; and Bolivia, mudslides. Closer to home, my own state has suffered from flooding and cyclones, with 99% of the state declared a natural disaster area. We watched in fear as homes on the east coast of Australia were devastated by water, while on the west coast, bush fires were sweeping through the countryside and destroying hundreds of houses. The most recent of these natural disasters is the massive earthquake and resulting tsunami tragedy in Japan, reminding us through graphic images that we have little resistance to the huge forces of nature. There is no doubt the wellbeing of individuals and families is paramount at these times. As home economists I believe we have a special role during these difficult times. Our specialist knowledge can transform aid delivery and recovery, and assist in supporting those affected. Importantly, home economics recognises the importance of the basic needs of food, shelter and clothing; and empowers individuals and families to regain a sense of wellbeing. According to the IFHE Position Statement, Home Economics is a "field of study and a profession, situated in the human sciences that draws from a range of disciplines to achieve optimal and sustainable living for individuals, families and communities... The thread or essential ingredient that all subjects, courses of study and professionals identifying as home economists must exhibit has at least three essential dimensions:

- a focus on fundamental needs and practical concerns of individuals and family in everyday life and their importance both at the individual and near community levels, and also at societal and global levels so that wellbeing can be enhanced in an ever changing and ever challenging environment;
- the integration of knowledge, processes and practical skills from multiple disciplines synthesised through interdisciplinary and transdisciplinary inquiry and pertinent paradigms; AND
- demonstrated capacity to take critical/ transformative/ emancipatory action to enhance wellbeing and to advocate for individuals, families and communities at all levels and sectors of society.

There is no doubt there is an important role for Home Economists to regain the balance in our communities.

Donna Pendergast, PhD
Editor, IJHE

**Non dietary exposure:
Family practice during use and storage of domestic pesticides**

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Abstract

The purpose of this study was to investigate the family exposure during use and storage of pesticides in their home environment. A survey of 150 students' families was conducted among rural and urban regions in and around Alexandria. Data were analyzed in the SPSS software program. The results showed that 96.0% of housewives used insecticide products with various trade name and active ingredients for controlling insects at home. The housewives generally reported using at least 2 or 3 types. Around half of the sample's members (51.3%) stored insecticides in the kitchen, followed by bedroom (31.3%). The family member who usually applied or sprayed pesticides was the mother (71.3%). It was found that 35.3% understand the label. More than one third of the respondents depended on the salesman's information in marketing the effective product. Statistical analysis showed that there was significant correlation between using pesticides, non-changing of the clothes after spraying, and the presence of health adverse effect. Also, significant correlation was found between respondents' region and use of malathion. This study revealed that the likelihood of adverse health effects is related to the magnitude, frequency and duration of exposure. It is expected that families are exposed to 27ml of active ingredient per month during summer.

Key words: family practices; household insecticides; label; consumer protection; risk assessment; home management; non dietary exposure; daily activities

Introduction

The use and storage of pesticides in household and agriculture for crop protection and pest control has been associated with environmental contamination and human health problems worldwide (Khan, 1980; Van der Hoek, Konradsen, Athukorala, & Wanigadewa, 1998; Soares, Almeida, & Moro, 2003).

Pesticides are used throughout the community. These chemicals can enter the body through eating, drinking, breathing and absorption through the skin. There has been increasing concern about children's non dietary exposure to pesticides and the potential health effects of such exposure. The literature often suggests that young children are particularly susceptible to exposure to pesticides, and importantly that the majority of children's exposure to pesticides occurs within the home environment (World Health Organization (WHO), 1997). Exposure to household chemicals is affected by the way people handle them in terms of storage, use, and precautions. Thus, it is important to describe these practices, as they define the behavioural components of exposure and allow meaningful exposure

assessment (European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC), 1994). For example, Hakkinen (1993) demonstrated that the different ways of handling a granular detergent product led to different amounts of the product's dust being inhaled by the consumer. If products are used in high concentrations, or are mixed, diluted or used under poor ventilation conditions, a potential health hazard may ensue (Hughson & Aitken, 2004).

Millions of people are exposed to pesticides in the Eastern Mediterranean, an increasingly agricultural region. In Egypt, over 1 million children between the ages of 7 and 12 years help with cotton pest management, exposing them to pesticides. Pesticides were the leading cause of deaths from poisonings in children in Iran, according to a study conducted there (WHO, 2004a). The exposure of young children and agriculture workers to pesticides is the most relevant occupational hazard of pesticide use, primarily in developing countries (van der Hoek et al., 1998 Hurtig et al., 2003). Some scientists think that exposure to pesticides in the uterus may have negative effects on a foetus that may manifest in problems such as growth and behavioural disorders or reduced resistance to pesticide toxicity later in life (BBC, 2007). It is estimated that there are between one million and five million pesticide poisonings each year, resulting in 20 thousand deaths worldwide. The exact number of child poisonings from pesticides is unknown but is assumed to be large (WHO, 2004b). A large range of pesticide products with active pesticide ingredients are available for non agricultural use in the markets: these products include aerosol fly sprays, powders to kill cockroaches and ants, rodenticides, products to kill fleas, and liquids to treat head lice. Special mixed forms are locally and popularly used as insecticides in the region.

The production, trade, use, and release of many synthetic chemicals are now widely recognized as a global threat to human health and the environment. Yet, the world's chemical industries continue to produce and release thousands of chemical compounds every year, in most cases with no or very little testing and understanding of their impacts on people and the environment, the consumer level of knowledge about these synthetic chemicals is low in Alexandria (Abdelgalil, 2004).

There are currently no comprehensive studies of non agricultural pesticides being used in homes and gardens. There have been a number of studies of domestic pesticide use in the USA. In particular, there has been increasing concern about children's non-dietary exposure to pesticides and the potential health effects of such exposure. A number of epidemiological studies, mostly conducted in the USA, have associated the use of pesticides with a variety of alleged adverse effects in children, including cancer, and problems with the nervous system, immune system and reproductive system (Bonvallot & Dor, 2004; Zahm & Ward, 1998, Daniels, Olshan, & Savitz, (1997)). However, little evidence is available on the health effects of long-term, low-level chemical exposure of housewives such as through inhalation of non-volatile components when using spray chemical products (Mergler, 1999; Gauke et al., 2009).

In Egypt, according to a recent report, the percentage of children below 5 years who suffer from acute respiratory diseases is estimated to be 10.7% in urban regions, and 8.1% in rural regions (The Information and Decision Support Center (IDSC), 2005). Certain populations of children, for example, children of agricultural workers, are especially vulnerable to poisoning from pesticides. A foetus can be exposed in the uterus when their mothers use pesticides,

work in a sprayed fields, or work near spraying operations. While breastfeeding is the best choice for infant nutrition, it is possible that mothers exposed to excessively high levels of pesticides can retain chemicals in their breast milk, thereby exposing their children (Yorghos Remvikos 2008).

Little is known about pesticides/ insecticides management and its use within the families. No information exists on the intensity and frequency of pesticides application, costs, market options or housewives' knowledge of pesticides application use, storage, precautions and pest biology. There are reports of undesirable effects of pesticides on humans that include acute and chronic health problems through contaminated soil and water. There are numerous pesticides active ingredients and each has a different impact on human health and the environment (Fernandez-Cornejo & Jans, 1995). As a result of the widespread dependence of pesticides and continued problems of pest attacks, a study of current practice in use and storage was carried out in and around Alexandria based on a previous study on the toxicity levels of several organophosphorus pesticides on the market (Kenawy & Abdelgalil, 2008). The author, who lived in a European country for a period of time, and currently is a lecturer of a curriculum titled home tasks management for under and post graduates students and another curriculum titled family health and the environment for under and post-graduate students at the department of home economics, Alexandria University, noticed the enormous amount of pesticides women use compared to their European counterparts.

The major objectives of this study are (i) to obtain comprehensive information on domestic pest control, patterns of pesticide products and the pesticides market, (ii) to investigate the number of pesticides products used and the family practices in using and storing domestic pesticides at urban and rural regions in and around Alexandria, and (iii) to estimate the quantity of active ingredients to which families are exposed in the home environment. This information is needed to evaluate the potential returns of different strategies to reduce the use of pesticides and to decrease chronic exposure and pesticide residues in our domestic environment. It is also essential for an analysis of appropriate points within the non-dietary exposure to monitor and control the flow of residues to consumers.

2. Materials and methods

The methods used in this study were adapted from the model developed by French anthropologist (Desjeux, 1998; Desjeux, Alami, & Moussaoui, 2009) to understand daily life, with a focus on use, practices, and unresolved problems to determine whether a product or service can fit into practices on a micro-social scale.

A questionnaire based on standardized questionnaires used in other studies (Abdelgalil, 2004) was prepared and tested on ten volunteer housewives. Suggestions from this group were included in the final standardized questionnaire, which included items related to housewives' practices in using and storing pesticides.

Participants in the study were 150 housewives who were living in urban and rural regions in and around Alexandria, and who were in charge of household chores; they were selected as they were the mothers and relatives of students. They were observed and questioned using the questionnaire between September and November 2008.

Interviews were carried out by well trained students in the home economics department at Alexandria University, to aid the researcher in the distribution and collection of the data. Observations of real work strategies were complemented by asking the women about the reasons for their observed choices of insecticides. The collected information helped to understand housewives' use and storage of domestic pesticides in different regions. Questions were ordered according to domestic tasks; the questionnaire Reliability Coefficients Alpha = .6247.

Housewives were asked about (i) personal information: age, education level, family size and number of children at home, work status, and the resident region (urban /rural region), (ii) pest control management at home: the types and number of insecticides used to control insect, the storage area at home, reading and understanding of pesticide labels and caution signs, and the role of marketing in choosing the domestic pesticides; (iii) practices and handling of pesticides: who applies or sprays the pesticide, the wearing of a mask and gloves during use, the changing of clothes and washing of hands after application, whether windows are closed or opened during application, and the regularity of application; and (iv) exposure and health effects; whether any family member attended a doctor in regards to symptoms related to the respiratory system, immune system, or nervous system. The amount of pesticides used in each activity was observed and measured in (i) cups if the products in powder form, and (ii) splashes if in liquid or spray form. The amount was later measured at the home management laboratory and converted into milligram or grams depending on the physical state of the product. Raw data from the questionnaires were coded then analysed using SPSS (Statistical Package for Social Science) version 10.0 (SPSS Inc). Data were mainly expressed descriptively as percentages or mean scores. Pearson correlation analysis was used. Statistical significance was set at $p < .05$ and $p < .01$. (Albahei, 1978).

3. Results and discussion

3.1 Participants' profiles

Table (1) presents the demographic and occupational characteristics of the 150 housewives included in the analysis. Almost one third of the participants lived in the urban regions of Alexandria; the majority of respondents (70.7%) lived outside Alexandria in the rural regions of Albehaira Governorate. The age of the housewives ranged from 24 to 59 years ($M = 38$ years). In terms of education, 26.0% had moderate education or completed preparatory school, 43.3% had attained a diploma or completed three years of education after basic education, and 30.7% had attained a university degree or higher level of education. Regarding family size, 50.0% of the families had between 2 and 4 children, and (30.0%) of respondents had more than 4 children. Almost one third of respondents (30.7%) reported working in paid occupations, while 69.3% were not in paid employment.

3.2. Pest control management

The use, number, types, storage, and purchasing of pesticides, in addition to exposure to pesticides and the active ingredients of pesticides, were explored in this study.

Characteristics	Housewives' age				Education attainment			Family size			Work status		Resident region	
	20-29	30-39	40-49	> 50	Moderate	Diploma	Univ'y degree	2-3	4-6	>6	Yes	No	Rural	Urban
N	26	67	51	6	39	65	46	30	75	45	46	104	106	44
%	17.3	44.7	34.0	4.0	26.0	43.3	30.7	20.0	50.0	30.0	30.7	69.3	70.7	29.3
Total	Mean = 38 STD = 8.354 N=150				N=150			Mean=5,173 STD=1.801 N=150			N=150		N=150	

Table 1: Social and demographic characteristics of the housewives in the study

3.2.1. The use of pesticides

The interviews showed that only 4.0% of respondents considered themselves not to be pesticides users; 96.0% of respondents reported the use of several types of pesticide / insecticide products at home. In terms of multiple product use, 26.0% and 40.7% of respondents reported using 2 or 3 types of insecticides at home, respectively, either within the proceeding four months; only 28.3% of respondents use 4 or more types of insecticides (see table 2).

Among the pesticides users, a significant correlation (2-tailed, at 0.01 level of significance) was found between the use of malathion and living in a rural region (.361**). In addition, a significant correlation (2-tailed, at 0.01 level of significance) was found between the frequency of pesticide use and the age of respondents, such that younger housewives used pesticides more frequently than did older housewives (.457**). Further, a significant correlation (2-tailed, at 0.01 level of significance) was found between the use of pesticides and the presence of health problems such as asthma or neurological symptoms, as diagnosed by a doctor (.380**).

Variables	Non users				Users					Total N=
	0	1	2	3	4	5	6	Total		
Number of products used	6	1	39	61	32	10	1	144	150	
% of respondents	4.0	0.7	26.0	40.7	21.3	6.7	0.7	96.0	100	

Table 2: Number and percentage of products used per family

3.2.2. Types and purpose of using pesticides

The types of pesticides used at home depended on the reason for use and consumer preferences. Regarding the form of pesticides, 87.3% and 88.7% of respondents used pesticides as spray and powder, respectively. Some respondents (26.7%) prepared a paste using boric acid to control insects. These respondents considered such a method as effective and safe as, and cheaper than, the pesticide products on the market (table 3).

Types of product	Types of products			Reason for use of pesticide products				
	Spray	Powder	Home-made paste	Head lice	Crawling insects	Flying insects	Ants	Rodents
Number of users	131	133	40	23	113	115	124	21
% of users	87.3	88.7	26.7	15.3	75.3	76.7	82.7	14.0

Table 3: Types and Purpose of using pesticides

3.2.3. Storage of pesticides / insecticides

The respondents reported that they store insecticides in many areas at home. Table (4) shows that 51.3% of respondents stored insecticides in the kitchen, either on the work surface (17.3%) or under the sink (34.0%), and 20.7% of respondents stored pesticides in the bathroom. Some respondents (14.7 %) considered the living room as storage area to avoid contamination of food and for tidiness, while 31.3% of respondents stored pesticides in the bedroom; some believed the bedroom to be the safest storage place in terms of restricting children’s access to pesticides.

Storage area	Kitchen			Bathroom	Living room	Bedroom
	Kitchen	Work surface	Under the sink			
Number of users	77	26	51	31	22	47
% of users	51.3	17.3	34.0	20.7	14.7	31.3

n= 150

Table 4: Insecticides storage area

3.2.4. Shopping and purchasing practice

Reading and understanding label

Table 5 shows that 50.0% of respondents reported reading pesticide labels and believed that the labels’ information was important; however, only 35.3% of respondents understood the label contents. Pesticide labels use the terms caution, warning, or danger; despite the low

rate of understanding of the labels, almost all interviewees considered insecticides to be harmful or dangerous.

Some families (34.0%) depended on the product’s marketing in deciding on the most effective and suitable product, and the method of application. Only 12.7% of the respondents specify a part of the family budget for purchasing domestic insecticides.

	Reading label	Reading precaution	Under-standing label	Depend on marketing information	Specify part of budget
Number of users	75	78	53	51	19
% of users	50.0	52.0	35.3	34.0	12.7

Table 5: Shopping and purchasing practices

3.3. Family practices in using pesticides

Exposure to a range of pollutants was examined by asking respondents about their practices regarding the application of pesticides. Such practices included protective measures such as wearing masks and gloves during application, washing hands and changing clothes after application, opening windows during application, and the regularity of application.

All respondents considered pesticides to be harmful, and all users reported washing their hands after use. A significant correlation (2-tailed, at 0.01 level of significance) was found between the existence of medical symptoms and changing clothes after pesticide use (.251**), and the presence of the children at home during spraying (.775**).

	Person using pesticide			Washing hands after application	Wear-ing mask	Wearing Gloves	Chang-ing clothes	Opening windows during spray-ing	Closing windows during spraying	Exist-ence of symp-toms
	Mother	Father	Other							
N	107	62	47	144	5	6	13	36	108	87
%	71.3	41.3	31.3	96.0	3.3	4.0	8.7	24.0	72.0	58.0
Educ’n				0.372*						

Table 6: Family practices during pesticide use

3.4 Exposure to pesticides and health effect:

Chronic, low-level exposure to pesticide can affect the skin, eyes, nervous system, cardiovascular system, respiratory system, gastrointestinal tract, liver, kidneys, reproductive system and blood. Recent research has examined the effect that some pesticides may have on

the endocrine (hormone) systems of children. Such endocrine-disrupting chemicals can inhibit normal hormones, which may affect the physical and neurological development of children and adolescents (WHO, 2004).

3.4.1 Regularity of application

More than half (57.3%) of respondents reported that they used insecticides regularly, and usually applied several types of insecticides during a month. Table 7 shows the percentage of participants using pesticides daily (30.0%), weekly (30.7%), and monthly (35.3%). Although it was difficult to arrive at precise estimates, it was generally recognized that a considerable number of people continue to be exposed to and affected by pesticides.

	Regularity of application			Spraying or application			
	Regular application	Not regular	Total	Daily	Weekly	Monthly	Total
Number of respondents	86	58	144	45	46	53	144
% of respondents	57.3	38.7	96.0	30.0	30.7	35.3	96.0

Table 7: Regularity of application or spraying

3.4.2. Active ingredient

Observation and the questionnaire revealed that different insecticides were used by respondents at home; some products have the same active ingredients but were marketed under different trade names. Table 8 presents the active ingredient listed on the containers' label. There is only one family of respondents reported using two kg malathion 5% per year for using in farm and house.

It was found that the capacity of the most commonly used pressurized containers is 300ml liquid or 250gm powder per container. The most commonly used active ingredients are organophosphate and pyrethroid, and some insecticides contained two or more kinds of active ingredients. Nearly half (46.7%) of the respondents used malathion 5% concentrate, which is used in rural zones as weed killer and as insecticide for controlling ants, while 44.7% of respondents used insecticides containing a mixture of active ingredients classified as organophosphate and pyrethroid, or a mixture of two types of pyrethroid, in addition to other chemical agents such as solvents, propellants, or deodorized kerosene.

3.4.3. Estimating the quantity of active ingredients to which families were exposed

Observation revealed that exposure of family members to insecticides happened in the home when insecticide powder was placed on work surfaces, or on the floor in the corners of the rooms or kitchen. Children at home may have been in contact with contaminated surfaces such as furniture or play equipment because of spraying insecticides daily, sometimes more than once a day with different amounts of splashes. The three most frequently used products were considered when trying to estimate the quantity of active ingredients to which families

were exposed daily, weekly or monthly. A simple calculation method was used to determine the quantity of active ingredients used per month and per season (table 9).

Product	Active Ingredients (A.I.)		Action	Chemical class	% of users
	Name	% of A. I. into the container			
1	Sumithion	3.0	Insecticide	Organophosphate	5.3
2	Deltamethrin 98%	0.02	Insecticide	Pyrethroid	39.7
	Sumithrin	0.5	Chemical agent		
	Butane	45.0			
	Deodorized kerosene	53.88			
3	Imiprothrin 50.5%	0.2	Insecticide	Pyrethroid	33.3
	Deltamethrin 98%	0.025			
4	Tetramethrin	0.2	Insecticide	Pyrethroid	44.7
	Malathion	1.0	Weed killer	Organophosphate	
5	D-allethrin 92%	0.136	Insecticide	Pyrethroid	32.7
	Tetramethrin 95%	0.368	Insecticide	Pyrethroid	
	P.B.O	0.500			
6	Imiprothrin 50%	0.20	Insecticide	Pyrethroid	39.3
	Deltamethrin	0.02	Insecticide		
		55.0	Chemicals		
7	Malathion	5.0	Insecticide	Organophosphate	46.7
			Weed killer		
8	Pyrethroid	0.325	Insecticide	Pyrethroid	35.3
		99.175	Chemical agent		

Table 8 Pesticides most used by the housewives, and the pesticides' active ingredients

Product	Active ingredient	% of Active ingredient	Active ingredient/ container	Daily exposure	Weekly exposure	Monthly exposure	Per Season (3 month)
1	Malathion 5%	5.0		12.5gm	12.5	50gm	150gm
2	Pyrethroid	0.3s25	0.975ml	0.975ml	6.825ml.	27.3ml.	81.9ml.
3	Tetramethrin	0.2	0.5	0.5	0.5gm	2gm	6gm
	Malathion	1.0	2.5	2.5	2.5gm	10gm	30gm

Table 9: Percentage of active ingredients to which families were exposed

The likelihood of adverse health effects is related to the magnitude, frequency and duration of exposure to these chemicals. Some participants reported using products containing a mixture of active ingredients, and reported using the entire container in each application. Thus, regular use may result in families being exposed to 81.9ml of pyrethroid during a 3-

month period, for example, during summer when products are used frequently to control flies.

The respondents in this study reported that they have never been previously diagnosed with pesticide poisoning or medically treated for any exposure to any pesticide.

3.4.4. Existence of symptoms

Table 6 shows that more than half (58.0%) of the respondents reported that at least one family member was diagnosed by a doctor as suffering from symptoms relating to the nervous system, or from asthma. Several researchers (Morgan, 1982; Meister, 1984; Haug & Hoffman, 1990; WHO, 2004) state that cold burning and numbness of the skin are experienced in people exposed to 5-12mg deltamethrin per cubic meter of air; in addition, headache, heartburn and skin spots were reported, and these symptoms were dependent on the time of the year.

Significant correlation between resident region, product use, and person applying product

	Resident region e	Ragon	Malathion	Insecticide powder	Rodenticides	The mother
Resident region	1.000	.223**	-.361**	.167*	.168*	.274**

** Correlation is significant at 0.01 level (2 tailed)

* Correlation is significant at 0.05 level (2 tailed)

Discussion

Estimates of the potential dermal intake of organophosphate and pyrethroid by children from contaminated surfaces suggested that risks of acute and chronic effects are not slight, since exposures may occur for moderately long periods at intervals of approximately several days before cleaning or removing the dust of powder insecticides (Lu & Fenske, 1999). Pyrethroid was the most common active ingredient in the insecticides used by the participants. Deltamethrin is a synthetic insecticide based structurally on natural pyrethrins, which rapidly paralyse the insect nervous system giving a quick knockdown effect (Haug & Hoffman, 1990). There is no degradation of deltamethrin in storage for 6 months at 40C°. It is extremely stable to atmospheric oxygen (Kidd & James, 1991). Recently, in South Africa, residues of deltamethrin were found in breast milk, together with DDT, in an area that used DDT treatment for malaria control, as well as pyrethroid in small-scale agriculture (Bouwman, Sereda, & Meinhardt, 2006).

The aerial application of malathion and pyrethroid and its derivatives, a widely used organophosphate and pyrethroid insecticides, has raised our concerns about potential adverse health effects.

Exposure to deltamethrin during its manufacture over 7-8 years resulted in transient cutaneous and mucous membrane irritation, which could be prevented by use of gloves and face masks. No other ill effects were seen (Hayes & Laws, 1990).

Farmers who used agricultural insecticides experienced increased neurological symptoms, even when they were no longer using the products. National Institute of Health reported that data from 18,782 North Carolina and Iowa farmers linked use of insecticides, including organophosphates and organochlorines, to reports of reoccurring headache, fatigue, insomnia, dizziness, nausea, hand tremors, numbness and other neurological symptoms (NIH News 2005). Very young children explore, taste and touch objects and crawl on the ground, thereby they ingest and absorb pesticides if the areas and items they explore are contaminated. As children begin to walk, develop climbing skills and grasp objects, pesticides left within their reach pose a danger. Children who have a tendency to eat non-food items are at particular risk of ingestion of pesticides in contaminated items, such as soil or other objects that they tend to eat. A child's size and weight affect pesticide poisonings because, relative to their size, children eat, drink and breathe more than adults. The central nervous system undergoes its period of most rapid development from the foetal stage through the first six years of life, so young children are especially vulnerable to pesticides that act as neurotoxins. The dermal area of an infant per unit of body weight is greater than that of an adult, allowing for greater vulnerability to dermal absorption. Children's breathing zones are closer to the ground, exposing them to inhalation of pesticides that linger at floor level. The use of acutely toxic pesticides associated with a weak or absent legislative framework regulating pesticide use is one of the major reasons for the high incidence of poisoning in some developing countries.

Additional factors such as lack of information, low education levels in the rural region, poor and inadequate working conditions, inadequate protection during pesticide application, and inappropriate spraying technology have also been shown to play important roles in exposing families to hazards. In order to reduce the exposure of human to insecticides, it is necessary to reduce the level of active ingredients in products, and to raise awareness among families about how to handle pesticides and domestic insecticides during application and storing. This is because all family members in every home is exposed to insecticides, for instance when insecticides are applied to work surfaces, to the floor, and in the corners of rooms including the kitchen. Children are at risk of exposure through coming into contact with contaminated play equipment.

Recommendations

Programs of pesticide safety education and pesticide application regulation must be designed to protect the families from pesticide misuse. However, reducing the use of pesticides and choosing less toxic pesticides may reduce risks faced by society and the environment as a result of pesticide use.

Acknowledgements

The authors are grateful to Professor Isis Nawar for her advice and comments.

Biography

Dr Mona Sharaf, lecturer of household management, Alexandria University is a PhD through joint channel Franco Egyptian in agricultural sciences. Her PhD was about the knowledge and attitudes of Egyptian and French consumer towards the Genetically Modified Foods in the markets. She is the Faculty Coordinator of university project Management Information System, faculty focal point for European projects and FP7. Prior to this appointment, she served seven years as a lecturer and Head of the Department of Home Economics at the Faculty of Education, Kingdom of Saudi Arabia. Sharaf lectures, researches, and writes about Home Economics education, household consumption, family resources management. Email:mon_abdelgalil@hotmail.fr

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De-fogging the philosophical, professional mirror: Insights from a light-hearted Metaphor

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Abstract

This paper employs the metaphor of a foggy mirror to gain fresh insights into how the profession of home economics can ensure philosophical well-being. After describing the science of foggy mirrors, the discussion turns to three options available to the profession to augment professional self-esteem, philosophical alignment and integrity: (1) custom-design a non-fogging professional mirror, ensured by a global dialogue and consensus on a core professional philosophy and set of competencies; (2) treat our current professional mirror to reduce how often it fogs up, appreciating that temporary professional insights and clarity are preferable but not sufficient; and (3) periodically swipe a permanently fogged mirror creating undesirable, permanent professional smears, with nominal clarity and vision. We argue that the best strategy is the first and we make a case for the necessity of an agreed-to philosophy of practice. Our hope is that, eventually, each person looking in the mirror will embody the agreed-to philosophical core of the profession.

Keywords: home economics, human ecology, family and consumer sciences, philosophical well-being, professional self-esteem, integrity, professional image

Around the world, members of the profession (home economics, human ecology, family and consumer sciences (FCS), and human sciences) are celebrating the beginning of a new century of influence and professional growth. As anticipated, our 100th birthday celebration has led to “an intensive re-examination of where it has been and where it is going” (Goldsmith, 1993, p. 48). To illustrate, the theme for the 2010 101st American conference was a New Century for FCS: *New Challenges, New Solutions*. The theme for the 2010 International Federation for Home Economics (IFHE) Council in Ireland was *Vision 2020: Home Economics, Changing Perspectives in a Changing Environment*.

As the profession moves through the 21st century, it is experiencing a convergence, a blending of the old with the new, deeply influenced by how we see ourselves, what we do and how others see us (McGregor, 2007a; Pendergast, 2009). Homes and families are the core social institution of all cultures. They are being re-defined as they struggle to change in order to cope with changes in other social institutions (e.g., economies, labour markets, governments, faith institutions) (McGregor, 2009a). For the sake of responsibly fulfilling multidimensional individual and family well-being (McGregor & Goldsmith, 1998), it is paramount that home economists own what they do and stand behind it (Goldsmith, 1993, 2009). However, this aspect of our professional practice currently is compromised because of

ebbing philosophical well-being and lack of alignment between personal and professional philosophy. The profession needs fresh insights into philosophical well-being because it affects our professional self-esteem (McGregor, 2006).

Regarding professional self-esteem, what do we see when we look in the proverbial mirror? How do we feel about that image? How philosophically-well are we, as professionals and as a profession? The purpose of this paper is to begin to explore these questions by employing a light-hearted (playful) metaphor of a foggy mirror. We assert that by using this metaphor, we can learn about ourselves, personally and as a profession.

To that end, the next section shares an overview of the science of foggy mirrors, followed with an application of this metaphor to help strategize about how to enhance philosophical well-being, professional self-esteem and philosophical alignment. We believe that the distorted reflection in a foggy mirror (or the reflection from a clear mirror) affects what we conclude about ourselves and our professional future. We examine what can be done to create a new mirror or de-fog a regular mirror so we are not continually staring at self-induced and externally generated professional smears, created as we swipe at the surface to temporarily remove the fog to gain vision and clarity. Our hope is that, eventually, each person looking in the mirror will embody the agreed-to philosophical core of the profession.

The science of fog and mirrors

As a caveat, we recognize that the word “science” is complicated and often taken to mean natural science. As we employ this metaphor, we opt to first explain the natural, empirical science of a foggy mirror, anticipating that readers are familiar with the assumption that all sciences—natural, human and social—are germane to home economics practice. We believe this metaphor is a useful tool for crossing the borders of the academy, professional practices (generalized and specialized), business, and everyday life. By stretching our points of view (stretching our horizons), we can better relate to others, thereby enabling us to see the whole picture—a philosophically-well profession.

Furthermore, we assume that professional, philosophical clarity is a combination of the nature of the person and the nature of the mirror. Regarding the latter, the coating on the mirror represents our level of agreement about a philosophical core. Any reflection of the viewer bounces back off of this coating, in addition to reflecting the viewer’s inner philosophical essence (the nature of the person). All home economists have some degree of philosophical well-being and some degree of alignment with the existing philosophical core (Vaines, 1990). A mirror forms an image by reflecting light. This metaphor suggests that the mirror reflects back the inner light (the philosophical wellness) of each home economist and does so by bouncing the image off of its existing philosophical coating (whether agreed-to or not). If the mirror is clear, it reflects back whatever is inside the person and does so from the level of current philosophical agreement of the profession. From an unfogged surface, the viewer gains clarity about inner and outer philosophical alignment. At least with a clear reflection, people can make choices. To that end, the paper is about the significance of having an agreed-to philosophical core and about how to achieve alignment between personal and professional philosophies of what it means to be a home economist.

Everyone is familiar with glass mirrors used in bathrooms and with the fog that can build up with too much moisture and condensation. Let us look at the science of foggy mirrors. A mirror is any object that is smooth enough to form an image. Glass is mostly sand. Glass becomes a mirror when, through a detailed process, a reflective substance (usually silver or aluminium) is applied to the back. Sometimes a protective overcoat is applied to the glass to prevent oxidation of the reflective coating (to mitigate cloudiness).

The creation of fog on a mirror results from a physical reaction between water vapour (water in its gaseous state) and temperature of the air. The hot temperature of the water in the bath or shower reacts to the cooler temperature of the air in the bathroom, forming evaporation. This process causes people to see the foggy steam. The steam then sticks to the mirror. The resultant fog is a layer of moisture; that is, the water vapour is made visible. Fog is actually millions of little beads of water that collect on the surface of the mirror creating a sheet of water that scatters light, producing the distorted image in the reflection.

Fog obscures what is on the surface of the mirror or glass. It dims the image, clouds reality and conceals the truth. Clarity is blurred, leading to uncertainty, confusion and vagueness. With such reduced visibility, it is hard to really see what is staring back at people from the mirror. Actually, everything in the room is 'foggy' as well, but only the mirror 'shows it.' Touch the walls and ceiling and they are wet, too. Everything is wet because of surface tension. Water adheres strongly to itself and weakly to the mirror's surface; hence, the water clusters into drops. Because of the reduced tension between the surface of one water molecule to another, the tiny beads of water stick together on surfaces rather than spreading out. When enough droplets come together to form a dense surface (condense), fog is created, blocking one's ability to see the real surface. The fog is real, but it creates the feeling of an illusion. Reality is still there, just not clearly visible. It is obscured because the heavy mist reduces visibility (see Figure 1 used with permission, Wright, 2005).

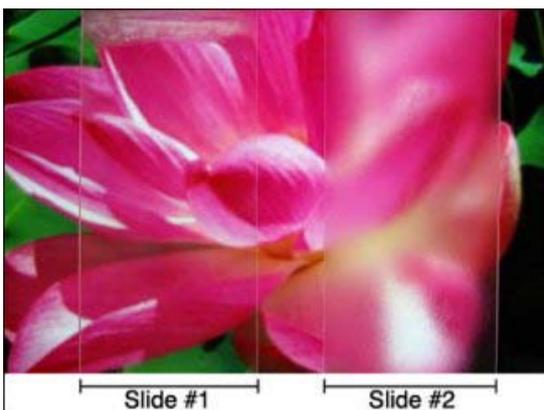


Figure 1

Mirrors that do not fog up have been designed. These mirrors are coated with a product that reduces the surface tension between the water droplets and the glass. There are also systems that heat mirrors from the back, thus reducing their tendency to fog up. Finally, people have found creative ways to temporarily remove the fog build up on regular mirrors, including

swiping the mirror with their hands or a special cloth, using a bathroom fan, or leaving the bathroom window open while showering.

Learning from the foggy mirror metaphor

Using this light-hearted metaphor (a combination of technical how-to and scientific know-how), we now explore what we can learn about practitioners' opinions of themselves when they gaze into their professional mirror. Basically, the metaphor tells us that we can (a) design our own mirror so that it *never* fogs up, (b) work tirelessly to mitigate unavoidable fogging of a regular mirror that has received a temporary treatment, or (c) let the mirror stay fogged up, swiping it clean when we need clarity. What would each of these strategies look like, and which is preferred to ensure philosophical well-being?

Custom-designed non-fogging professional mirror

Custom-designed non-fogging professional mirror

Professional integrity means one has to deeply respect the person who stares back from the mirror (McGregor & Gentzler, 2009). Imagine waking each morning of one's professional life and looking into a professional mirror that reflects back a healthy image of professional self-esteem and philosophical well-being. There is never any fog *because* there is philosophical well-being and alignment. Philosophical well-being is defined as always considering how one's practice might need to change to reflect the insights gained from constantly improving one's wisdom through deep, thorough and mature understandings of life. A philosophically-well home economist will have become a philosopher, a person who seeks reason and truth by thinking, meditating, deliberating about and celebrating life (McGregor, 2004, 2006).

An improved attitude or philosophical well-being *can* happen if we socialize (or re-socialize) members of the profession to a common philosophical core, one that holds regardless of areas of specialization or subfields that have emerged over the past 100 years (see McGregor, 2009c, 2010c; McGregor & MacCleave, 2007). We have to custom-design our own non-fogging professional mirror. This process entails respecting the tension between the profession's philosophical core and each practitioners' personal professional core, such that when they come into contact, they sheet off each other leaving a clear surface, indicative of philosophical alignment (e.g., Vaines, 1990). Through global dialogue, we can create this non-fogging mirror, akin to the breath of cool, fresh air that draws moisture away from the mirror, bringing clarity and focus to practice (McGregor, 2010c).

Mitigate unavoidable fogging

If, as a profession, we do not design our own professional mirror, and instead engage in remedial strategies to slow down the eventual fogging of a regular mirror, we end up creating a fall back plan. Most of the time, we are comfortable with what stares back at us in the mirror. We are relatively secure in our awareness and acceptance of a philosophical core for the profession and its imperfect alignment with our personal philosophies, including how we see ourselves as home economists and how others see us. This temporary comfort is possible because we took steps to slow down philosophical angst knowing that it would eventually materialize (the mirror *will* fog up). We would anticipate that when things get rough, our vision would be impaired by the clouding of the mirror (philosophical misalignment). There

would be anticipated, periodic philosophical roadblocks that would warrant our attention. We would not be able to regain clarity unless we undertook another treatment of the mirror (philosophical reflections), knowing that this too is temporary. Nonetheless, this temporary treatment is better than the remaining option, which is living with a perpetually fogged professional mirror that can only be temporarily cleared with technical, quick-fix treatments—often too little, too late, if at all.

Periodically swipe a perpetually fogged mirror

With a perpetually fogged professional mirror, unless the professional home economist swipes the mirror, she cannot see her image in the mirror. All that reflects back is a blurred, obscured, hazy professional image. This repeated lack of clarity can lead to low professional self-esteem and unsatisfactory, misaligned philosophical well-being. Simply swiping the

mirror with one's hand or cloth will smear the mirror and this smear will reappear the next time the mirror fogs up. It is not philosophically healthy to keep staring at a professional smear. Even if someone were to write something positive on a foggy mirror (e.g., "*I am proud to be a home economist*"), that message will only appear when the mirror fogs up again; otherwise, it cannot be discerned. There is no constant reinforcement of this professional validation. Also, the message disappears very quickly, meaning the professional and philosophical reinforcement is not lasting.

In truth, any message written on a mirror will continue to reappear until the mirror is cleaned or a new coating is applied to the back. So, if the image or message that emerges when the mirror fogs up is "*I am not sure about being a home economist*", this message never goes away and provides little professional solace. The result is that home economists avoid looking in the professional mirror and run the risk of becoming (remaining) philosophically unwell. In a series of short-term, quick fixes, they end up having to continually clean the surface of the mirror, always struggling with the nature of the messages that emerge when the mirror eventually fogs up again. This temporary fix to philosophical misalignment and low self-esteem is very labour and psychologically intensive.

Controlling the fog (philosophical alignment)

The authors asked themselves, "Do we fog up the mirror ourselves or does it get fogged up by external factors?" We concluded that the answer may be a bit of both. Regarding the former, if there is no intentional, coordinated effort to ensure world-wide global agreement of a professional philosophical core, we are to blame for fogging our mirror, for perpetuating professional angst and personal dissatisfaction with being a home economist. We can control this situation by building a custom-designed mirror that never fogs up, using a specially designed back coating (see below); that is, agree to a common philosophical core and advocate for personal and professional philosophical alignment.

Sometimes, the mirror becomes foggy because of external factors, such as the state of the economy. Who can deny the impact of the recent global recession on educational budget cuts? Smith and de Zwart (2010, p.26) observe that "[i]n the past twenty-five years, home economics has been buffeted by policy changes at the post-secondary and governmental

levels, which has [sic] shaken any preconceived notions about the permanency of its status as a school subject.”

The authors maintain that the main external factor that fogs our mirror is the public’s misunderstood, misconstrued understandings of home economics and what it is about, informed by prevailing world views. In such instances, we have to accept that we cannot directly control another person’s ideology or world view. We *can* understand that, usually, people hold (mis)conceptions of home economics due to past encounters with professionals in the field, and with more deeply entrenched, powerful ideological stances of what is important and valued in the world. Prevailing world views do not value families or the home except when they fulfil the roles of consumers, producers, and employees or labourers. If our *raison d’être* is families and homes, it stands to reason that we will not be valued as a profession by others who embrace these prevailing world views. We have to take a stand and push back against these mindsets (Goldsmith, 2009; McGregor, 2007a; McGregor, Pendergast, Seniuk, Eghan & Engberg, 2008; Pendergast & McGregor, 2007).

We can no longer downplay our century-long focus on home and family. The profession’s contribution to the world is too unique and too significant to be marginalized and ignored (McGregor, 2007b, 2010a; Pendergast & McGregor, 2007). Smith and de Zwart (2010) suggest as solutions more lobbying to maintain and promote existing home economics related degrees and the development of certification programs, more mentoring of teachers and professionals already out there, more dialogue, and above all promoting the value of the field. Although we appreciate and support these efforts, we take a different stance in this paper, arguing that we need to build each of philosophical well-being, personal and professional alignment, and professional self-esteem that are not readily compromised. Only then can we feel confident that we are assuming a solid philosophical stance as we collectively approach the solution of practical perennial problems faced by individuals and families around the world.

In particular, we need to open another space for home economics where we can engage in behaviour that challenges the ideological status quo (Pendergast & McGregor, 2007; McGregor 2009b). In the process of creating our own custom-designed, crystal-clear professional mirror, and in striving for personal and professional philosophical alignment, we have to re-conceive and use power in ways that are consistent with the needs of humanity, not the market or global economies. When we finally free ourselves of the weight of a smaller vision of ourselves (the image reflecting back from that cloudy mirror), we will enable each other to move closer to each other and connect professionally and with humanity (reduce the surface tension). It is time to come out from under the shadows and the distortions that may come from a flawed mirror (i.e., an ill-thought out philosophical core and/or misalignment of personal and professional philosophies).

Conclusions

From its beginnings, the profession has been focused on the human condition, lived out on a daily basis in families and homes (Brown & Paolucci, 1978; McGregor, 2010b). The profession has a rich history of addressing human needs in the home, community and work force

(Goldsmith, 2010b). It is an honourable calling. The good of humanity depends on families and homes and, by association, on home economists (East, 1979). But, we need to be philosophically-well and in alignment in order to meet this challenge.

Members of the profession need to free themselves from their old views and align themselves with new ideas (i.e., a new, custom-designed philosophical core). As more and more of us become philosophically well, we can become professionally assertive, grounded in a solid, agreed-to philosophy of practice and personal and professional alignment. Philosophy means friendship (*philo*) and wisdom (*sophia*) (McGregor, 2004, 2007b). With more philosophically inspired leadership, we would better ensure a highly sustainable discipline and profession (Goldsmith, 2010a), and a stronger family base for humanity. We would continue to emphasize more informed judgments and effective decisions (DeVaney, 2010), grounded in an agreed-to philosophical core.

Ellen Swallow Richards stood for education, for advancement, for fairness, and for a belief in human goodness and progress. To follow in her laudable footsteps, we need to own what we do and to stand behind it. We need to re-claim our place at the table from a position of collective philosophical alignment and power (Goldsmith, 2009; Pendergast & McGregor, 2007). If we all embraced this line of thinking, we would not hesitate to look in the mirror anymore; rather, we would design a philosophically sound mirror (core) and then relish and welcome the clear, certain reflection of ourselves (philosophical alignment), and of this outstanding profession.

Biography

Sue L.T. McGregor is a Canadian home economist at Mount Saint Vincent University. Her intellectual work pushes the boundaries of consumer studies/home economics philosophy and leadership from integral, transdisciplinary and moral imperatives. A member of the IFHE's Research Committee, she also chairs IFHE's Leadership and Philosophy Committee. She is a Kappa Omicron Nu Research Fellow. Affiliated with 20 professional journals, she is Associate Editor of three home economics journals. Sue has delivered 35 keynotes/invited talks in 10 countries and published over 120 peer-reviewed publications, 11 book chapters, five monographs. She published 'Transformative Practice.' 'Consumer Moral Leadership' was published in 2010.

Elizabeth B. Goldsmith, Ph.D., is a Fulbright Scholar and former White House policy advisor on women's and girls' economic education under the Clinton administration. She is professor of Family Financial Analysis in the College of Human Sciences at Florida State University and serves as a mentor for the U.S. Dept. of Labor's Wi\$eUp program for women ages 22-35. She has published 50 journal articles and given 18 international presentations from Brazil to Japan. She is the author of several college textbooks including Consumer Economics: Issues and Behavior, 2nd edition and Resource Management for Individuals and Families, 4th edition, both with Pearson.

Dr. Goldsmith is Co-Principal Investigator of a \$341,511 grant entitled "The Development of Superior Personal Investing Performance" from the Financial Industry Regulatory Investor Education Foundation. The objective of the study is to identify differences in financial and

investing practices of householders nearing retirement who differ markedly in terms of current household wealth but had similar opportunities to build household wealth during their lifetime.

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Maternal and child health education: a panacea to maternal mortality

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Abstract

This paper focuses on maternal and child health education as a panacea to maternal and child mortality and morbidity in Africa and in Nigeria in particular. Maternal and child mortality and morbidity were reviewed, with its effects on families and communities. Recommendations were made for reducing the maternal and infant mortality rates.

Keywords: Maternal mortality, morbidity, mortality, education.

Introduction

Provision of Maternal and Child Health (MCH) involves the meeting of health needs of women and their children. It focuses on good nutrition, clean environment, personal hygiene, adequate health facilities, good shelter, immunization against diseases, and good drinking water (Federal Ministry of Health (FMOH), 2000). MCH education demands that women should be trained in MCH practices which would enhance their health and that of their children. The health of the woman before and during pregnancy is a potential force that determines the health of the fetus (Imogie, 2000). Epidemiological studies all over the world have shown very strong correlations between the health of pregnant women and the outcome of pregnancies. Healthy pregnant women tend to have healthy babies. Very ill or malnourished women on the other hand are more likely to have problems during pregnancy and delivery and consequently the fetal well-being is affected (Ellis & Castello, 2002).

In order to achieve positive health outcomes the children should be protected against diseases such as tuberculosis, poliomyelitis, whooping cough, diphtheria, tetanus, malaria fever, measles, yellow fever and cerebrospinal meningitis through immunization, which should be timely and maintained. In addition, adequate breastfeeding, good nutrition, and protection against environmental conditions are essential in order to reduce infant death and morbidity. It is reasonable to assume that mothers can acquire appropriate knowledge and skills for meeting the needs of their children through MCH education. MCH education can be acquired through antenatal and postnatal clinics, family planning clinics, agricultural extension services, and community health services (Ingalls & Salerno, 1991).

In order to accomplish the goal of reducing levels of maternal and child mortality and morbidity in Sub-Saharan Africa (SSA), the Safe Motherhood Initiative (SMI) was launched by World Health Organization (WHO) globally in 1987; and the Society of Gynecology and Obstetrics of Nigeria (SOGON) launched the SMI in Nigeria in 1990. The initiative was implemented because it was determined that the dangers women face during pregnancy and

childbirth are closely connected with their ignorance, lack of education and poverty. Some United Nations (UN) organizations such as the United Nations Children Emergency Fund (UNICEF) and the United Nations Agency for International Development Services (UNAIDS) are also committed to reducing levels of maternal and child mortality and morbidity in SSA (Berer & Ravindran, 1999).

Maternal and child health education is vital for the reduction of maternal and child mortality and morbidity. It is expected to be a regular feature of antenatal and postnatal clinics in Nigeria. However, at the dawn of the 21st century, maternal mortality is still unacceptably high in Nigeria (FMOH, 2000). For every 100,000 live births in Nigeria, about 1500 women die in the process of bringing these babies into the world (FMOH, 2000). This means that out of about 27 million women of reproductive age, 2 million will not survive either pregnancy or childbirth (FMOH, 2000). When this situation is compared with Europe and North America, which have maternal mortality rates (MMR) of 28 and 11 deaths respectively for every 100,000 live births (WHO, UNICEF, United Nations Fund for Population Activities (UNFPA), 2001), one would see that Nigeria's maternal mortality figures rank very high. It has also been noted that the increase in infant mortality rate from 87 per 1,000 births in 1989 to 114 per 1,000 births in 1996 reflected, among other things, the health and health education status of the mothers (FMOH, 2000).

Most of the obstetric causes of death are preventable and result from poverty, ignorance, poor hygiene, and lack of education and information on the part of mothers (FMOH, 2000). This situation applies to all states in Nigeria. Okereke, Kanu, Nwachukwu, Anyanwu, Ehiri, and Merrick (2005) also noted that in Nigeria, infants and maternal health prospects is a controversial issue, because of the laissez-faires attitude of government and the general populace. This problem stems from such factors as ignorance, apathy, poverty, lack of commitment, illiteracy and corruption. Yet, at this time there are few or no functional and well organized programs of MCH education administered at the antenatal and postnatal clinics in Nigeria.

Chamberlain (1997) reported a survey conducted on the health education given to expectant mothers and fathers. The aims were to prepare the couples for childbirth and childrearing. Formal antenatal and postnatal education classes addressed signs and symptoms of pregnancy, complications of pregnancy and delivery, stages in labor, personal hygiene, immunization, child health, family planning methods, and sexually transmitted diseases including HIV/AIDS, and included many excellent videos. Many good books about pregnancy and childbirth were also made available. Evaluation activities included asking women questions about what they learnt at each antenatal visit; conducting demographic studies on MMR and IMR; and the multigravidas educating the primigravidas. The conclusion of the study was that in the UK, women attend antenatal care because they believe it and they have been brought up to believe that antenatal care is the best way of looking after themselves and their unborn children.

Turan, Nalbant, Bulut, and Sahip (2001) reported a study on a clinic-based antenatal program for couples in Istanbul, Turkey. The program was designed to meet couples' expressed needs for information about health topics. Emphasis was placed not only on providing factual

information, but also on describing the important role that fathers can play in supporting women during pregnancy, during delivery and post-partum. The main components of the program were group educational sessions, a booklet and a telephone counseling service. Topics of the educational sessions were pregnancy, childbirth, infant feeding and care, post-partum women's health and family planning. Interviews revealed that participants improved their knowledge on topics related to pregnancy, birth, infant health, infant feeding and post-partum contraception.

Turan et al. (2001) also reported a study on a community-based program for expectant fathers and expectant mothers. The study focused on the effects of antenatal education not only on post-partum health behaviors but also on health, knowledge, attitudes and behaviors during pregnancy and childbirth. The programs were offered free of charge. Health personnel presented information and used participatory techniques such as large- and small-group discussions, demonstrations, role play, games and question-answer sessions. Booklets and brochures were also provided on topics such as pregnancy nutrition, preparing for childbirth, post-partum women's health, infant care, breastfeeding and contraceptive methods. Videos on preparing for parenthood, infant care and breastfeeding were also shown and discussed. Positive effects were seen in the areas of infant health and feeding, spousal communication and support. The researchers indicated that antenatal education programs for expectant mothers as well as expectant fathers can have positive effects on their reproductive health, knowledge, attitudes and behaviors. This would in turn reduce maternal and child mortality and morbidity. There is a need, therefore, for functional MCH education programs in antenatal and postnatal clinics for expectant and nursing mothers in Nigeria, in order to reduce the unacceptable rate of maternal and child mortality and morbidity.

However, some government policies, such as the National Health Insurance Scheme, have contributed much to the prospect of infant and maternal health in Nigeria. The scheme, if well managed, can result in an 80% improvement in the health status of all Nigerians. Another health policy by the Nigerian government involved the establishment of Primary Health Care (PHC) in villages and communities. This has helped to bring health services nearer to the people (Okereke et al., 2005).

Maternal and Child Mortality and Morbidity

Maternal death, according to WHO (1997), is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy. WHO consider that maternal death can be caused by any related or aggravated problem of pregnancy or its management but not from exact cause of death of a pregnant or recently pregnant woman particularly when deaths occur outside health facilities. For this reason, WHO and others working in this field often use the broader term "pregnancy-related death" while discussing maternal death.

The terminology

Maternal Mortality Ratio (MMR) as defined by WHO, UNICEF, UNFPA (2001) is the ratio of maternal or pregnancy-related deaths to total live births, expressed per 100,000 live births.

According to WHO, UNICEF, UNFPA (2001), maternal mortality is notoriously difficult to measure for both conceptual and practical reasons. Maternal deaths are hard to identify precisely.

The maternal mortality rate in the African region is the highest in the world. In some countries, the rate is as high as 2000 deaths per 100,000 births (WHO, 1998). Abouzahr (1999) observed that maternal mortality was a neglected issue during the 1970s and early 1980s, less because health professionals in developing countries were unaware of the problem than because they lacked the tools to quantify and analyze it. Countries with the ability to measure maternal mortality were precisely those where levels were low and vice versa. UNFPA (2000) reported that ninety-nine per cent of the approximately 500,000 maternal deaths each year are in developing countries, where complications of pregnancy and childbirth take the life of about 1 out of every 48 women. It is not uncommon for women in Africa, when about to give birth, to bid their older children farewell. In the United Republic of Tanzania, mothers have a saying: "I am going to the sea to fetch a new baby, but the journey is long and dangerous and I may not return (Aoyama, 2001).

As noted by Aoyama (2001), the current major reproductive health problems in the Middle East and North Africa (MENA) region include: high maternal mortality in several countries; high fertility and a slowing of the decline in fertility rates; early marriage and high teenage fertility; increasing prevalence of Sexually Transmitted Diseases (STDs) including HIV/AIDS; and female genital cutting in Egypt and Yemen. The MMR remain high in Yemen, Egypt and Morocco. Overall, a leading cause of death among women of reproductive age is pregnancy-related illness. The major causes of maternal mortality are bleeding, infection, and pregnancy-induced hypertension; about 25-30 per cent of maternal deaths are attributable to severe bleeding.

According to WHO (1986), in Uganda, maternal mortality was studied by Rexistne Short, who reported a rate of 13.7 deaths per 1000 births at Mulago Hospital in 1961. There was a short lived decline of MMR recorded in Mulago Hospital to 2.3 and 1.2 per 1000 live births in 1969 and 1972 respectively. By 1986, MMR had risen to 4.6 per 1000 live births. Mauritius is probably the only African country which has national data available since 1954, when MMR was 349/100,000; this has gradually decreased to 117/100,000. Other population-based data come from Machakos, Kenya, where MMR was 86/100,000. In Addis Ababa, it is 457/100,000; Gambia 1025/100,000; and Tanzania hospital report 1972-73 showed a rate of 4-8/1000. Most of these studies have confirmed that infection/sepsis, obstetric haemorrhage, ruptured uterus, obstructed labour and eclampsia remain the leading cause of maternal deaths.

Maine (1999) stated that there are at least three ways in which maternal mortality is special: first, its magnitude; second, its epidemiologic nature; and third, its programmatic requirements. One of the crucial characteristics of maternal deaths is that women run this risk every time they become pregnant, and this risk adds up over their lifetime. There is little mystery about the complications that kill pregnant women, and surprisingly little difference in causes between developed and developing countries.

Abouzahr and Berer (1999) noted that community studies from around the world have found that most maternal deaths take place during delivery or in the immediate post-partum period. Almost half of post-partum deaths take place within one day of delivery and some 70 per cent occur within the first week. In other words, there is a mismatch between women's need for maternal health care and the current patterns of provision and utilization of care in developing countries where women are not, in fact, getting the care they need at the time they most need it. As stated by Abouzahr and Berer (1999), the main causes of maternal deaths can be divided according to when they arise and why:

- (i) those which occur very early in pregnancy, such as ectopic pregnancy;
- (ii) those which arise from the complications of abortion, that is, retained products of conception, haemorrhage, sepsis and perforated uterus, mostly due to the use of unsafe or outdated procedures;
- (iii) those which arise mostly during late pregnancy, such as hypertensive disorders of pregnancy leading to eclampsia;
- (iv) those which arise during labour and delivery including prolonged or obstructed labour, retained placenta, vaginal or cervical lacerations, uterine rupture or inversion, which often arise due to poor or inadequate care;
- (v) those which arise from events in labour and delivery but which manifest in the first hours, days or weeks post-partum, including haemorrhage and sepsis, which are often the result of poor or inadequate care; and
- (vi) those which are true post-partum complications, such as thromboembolic disease.

According to Starrs (1987) and Okafor and Olukoya (1990), for every woman who dies in childbirth, many more survive but suffer long-term damage to their health. Starrs (1987) further stated that incontinence, uterine prolapse, infertility, and other illnesses caused by complications in pregnancy and childbirth contribute to the persistent suffering and poor quality of life experienced by millions of women. He also reported that for many women, complications during pregnancy, or infection from unclean hands or unsterile instruments, can lead to pelvic inflammatory disease which, apart from pain and suffering, can lead to infertility. This is a major problem in Africa, where it affects 15 to 20 per cent of all women and is often caused by sexually transmitted infections or the complications of pregnancy.

As stated by Berer (1999), the number of health problems (morbidity) reported by women in the first months after delivery is high. Problems include anaemia and nutritional depletion exacerbated by serious blood loss and breastfeeding, backache, urinary incontinence, frequent headaches, mastitis and other breast problems, hemorrhoids, constipation, depression and anxiety, pain in the perineum and vulva following from poor repair of episiotomy and perineal tears, and unrepaired fistula or uterine prolapse, which

in turn may lead to other forms of morbidity, such as constant irritation or tissue and genital infections.

Effects of maternal deaths and illnesses on members of the family

Maternal morbidity is in some cases so devastating to the personal, marital and social life of the woman that she may wish she had not survived. Maternal morbidity can thus be almost as damaging to women and their families as maternal mortality. UNFPA (2000) noted that infants and children also suffer as a result of poor maternal health. The same factors that cause maternal mortality and morbidity, including complications and the associated poor management of pregnancy and childbirth, contribute to an estimated 8 million still births and new born deaths each year.

The cost of a lost life cannot be sensibly calculated. Maternal deaths and illnesses affect women, children, spouses, extended families and communities in many ways. The economic costs of a mother's death include her lost contributions (monetary and non-monetary) to the family and its survival, increased mortality among her children, increased burden of home maintenance and child care to her survivors, and additional impacts on communities and society. UNFPA (2000) also stated that a woman's death also has a bigger negative impact on children's growth, and on school enrolment rates, particularly in poor families; younger children enroll later, and those aged 15-19 drop out earlier.

Maternal and child health education

Maternal health refers to the health of women during pregnancy, childbirth and the postpartum period (WHO, 2011). Child health is closely related to maternal health, as nutrition during pregnancy, birth conditions, birth spacing, and health status of the mother impact the health of the child prior to, during and after birth. Children represent the future, and ensuring their healthy growth and development ought to be a prime concern of all societies. MCH education includes knowledge about conception and pregnancy, prenatal growth and development of the baby, child delivery, the impact of birth experience on the child, hospital and home care experiences of the baby, feeding patterns for the baby, growth and development of the child and problems of child development (Olaitan & Akpan, 2003). The MCH education is essentially preventive and partly curative in nature, and is necessary for the good health of the mother and her child. Quality MCH education is important in preventing newborn deaths and morbidity. Addressing the complex challenge of maternal and newborn deaths and morbidity requires fully functioning health care services that give high priority to pregnancies and their outcomes. Besides this, interventions are needed at the community and policy levels to ensure that pregnancies are wanted and that women have access to the care and health education they need when they need it.

Recommendations

The care of pregnant women, mothers and their children deserves the highest priority in every community. Pregnant women and children represent high risk groups within the population. The situation is particularly serious in developing countries where the

statistics show very high mortality and morbidity in these groups as compared with the rest of the population. Nigeria, the largest country in Sub-Saharan Africa (SSA), is currently estimated to have some of the most acute population and reproductive health problems in Africa. Its need for comprehensive MCH education programs to be administered in antenatal and postnatal clinics surpasses those of many countries in SSA. So in light of the above:

- (i) All pregnant women must be sensitized to attend the antenatal and postnatal clinics for thorough examination.
- (ii) There should be appropriate health education with respect to impact, prevention and treatment of morbidities of women in health facilities at any opportunity.
- (iii) Women should be taught nutrition education for vitamin deficiencies and anaemia.
- (iv) Women should be educated about family planning services.
- (v) Women should be taught about prevention of sexually transmitted diseases, including HIV/AIDS.
- (vi) Women should be enlightened about adequate breastfeeding.
- (vii) Enlightenment campaigns on immunization should be carried out.
- (viii) Provision of accessible, affordable, well-staffed and well-equipped health facilities at all levels for use by women should be ensured by the government.
- (ix) The use of audio and visual aids (slides, posters, film clips, video), and handouts on MCH at the antenatal and postnatal clinics should be ensured.
- (x) MCH education should be taught in local dialect to illiterate mothers.
- (xi) Home Economists should incorporate the topics/issues of the content of maternal and child health education into the curriculum of Home Economics at the various levels of education.
- (xii) Education of the public on danger signs of prolonged labor and regular retraining of health personnel on intrapartum care in addition to upgrading neonatal facilities are important measures necessary to reduce the currently high perinatal mortality rate in Nigeria.

Conclusion

This article has reviewed maternal and child health; maternal and child mortality and morbidity; and maternal and child health education in Africa and in Nigeria in particular. In light of the rapid population growth, ignorance, lack of education (especially on the part of women), poverty, apathy, lack of commitment (on the part of the government), corruption and increased risks of adverse environmental health exposures, maternal and child health faces many problems. It is therefore believed that a serious and objective maternal and child health education program should be called for in order to prevent any health catastrophe. It is envisaged that concrete and practical maternal and child health education sessions in

antenatal and postnatal clinics could bring significant improvement in the health of Nigerian mothers and children.

Biography

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ISSN 1999-561X