The Impact of Household Hazardous Waste upon the Environment Pollution

Alaa Noori Sarkees/Assistant Instructor[*]
Dr. Mohammed Fathil Khalifa/ Professor

الخلاصة

الهدف: ١. تحديد تأثير الجوانب ذات العلاقة بالنفايات المنزلية الخطرة على تلوث البيئة.
٢. التعرف على العلاقة بين الصفات الديموغرافية للقائمات على شؤون المنزل والجوانب ذات العلاقة بالنفايات المنزلية الخطرة.

المنهجية: أجريت دراسة وصفية للفترة ما بين ١٤ كانون أول ٢٠٠٤ و٢٠ تشرين أول ٢٠٠٥ وباستخدام أسلوب التقييم. تم اختيار عينة (احتمالية) من (٣٣٦) قائمة على إدارة شؤون المنزل من المناطق المحيطة ب(١٤) مركز رعاية صحية أولية كنقاط تمركز (٨) حضرية و(٦) ريفية لمحافظة بغداد.

جمعت البيانات من خلال استخدام أداة التقييم بعد إجراء المصداقية والثبات لها والتي تكونت من الصفات الديموغرافية للقائمات على شؤون المنزل، والجوانب ذات العلاقة بالنفايات المنزلية الخطرة كالعوامل التي تسبب النفايات المنزلية الخطرة، الوعي تجاه تلك النفايات، وتدبيرها. تم تحليل البيانات من خلال استخدام أسلوبي التحليل الإحصائي الوصفي (التكرارات، النسب المئوية) والإحصاء الاستنتاجي (تحليل التضادد المتعدد ذو الخطوة الواسعة).

النتائج: بينت النتائج أن جانب الوعي تجاه النفايات المنزلية الخطرة كان له التأثير الأكبر على النفايات المنزلية الخطرة من العوامل المسببة في حدوثها وتدبيرها. استنتجت الدراسة بان التعليم المتدني، الوجود مع عائلة ممتدة، العيش بمستوى اجتماعي-اقتصادي متوسط تؤثر على الوعي تجاه تلك النفايات والتعرف على العوامل المساهمة وتدبيرها.

التوصيات: أوصت الدراسة إلى إمكانية تصميم وبناء وتقديم برامج التوعية العامة للقائمات على إدارة شؤون المنزل لزيادة وعيهن تجاه التعرف على العوامل التي تسبب النفايات المنزلية الخطرة وتدبيرها.

Abstract

Objectives: To determine the impact of the household hazardous waste's aspects upon the environment pollution .and to identify the relationship between the households' demographic characteristics and the aspects of household hazardous waste.

Methodology: A descriptive study is conducted between December 14th 2004 to October 20th 2005that uses of an assessment tool. A probability (simple random sampling) of (336) principal's households which is selected from the zones around the (14) primary health care centers as focal points, (8) in the urban and (6) in the rural areas of Baghdad Governorate. After reliability and validity were determined Data are collected through the use of an assessment tool that is consisted of households' demographic characteristics and factors that produce household hazardous waste, awareness towards such waste, and management of this waste.

Data is performed through the use of descriptive statistical approach (frequencies and percentages) and inferential statistics (stepwise multiple regression analysis).

Results: The findings reveal that the aspect of awareness towards household's hazardous waste has a greater impact upon the household hazardous waste than factors that produce this waste and management of such waste. The study concludes that Low-educated, being in extended family and living with moderately oriented socioeconomic status have influenced the households' awareness towards their hazardous waste and identification of factors that contribute to such waste and their management of this waste.

Recommendation: The study recommends that the Public Awareness Programs can be designed, constructed and presented to increase their awareness towards identification of factors that produce such waste and its management.

Key words: Impact, of Household Hazardous Waste, Environment Pollution.

Introduction

The environment plays a key role in the ultimate fate of pollutants. The environment consists of soil, surface water, and the atmosphere; all sources of pollution are initially released or dumped into one of these phases of the ecosystem. As pollutants interact with the environment, they undergo physical and chemical changes and are ultimately incorporated

[*] College of Nursing, University of Baghdad

into the environment. The environment thus acts as a continuum into which all waste materials are placed. The pollutants, in turn, obey the second low of thermodynamics: matter cannot be destroyed; it is merely converted from one to another. Thus, taken together, the way in which substances are added to the environment, the rate at which these waste are added, and the subsequent changes that occur determine the impact of the waste on the environment **(1)**. Virtually, every household produces hazardous waste and many people do not even realize it. Many of products, we use around our house, contain chemicals that can cause harm to our health and our environment if they are not used and disposed off properly. Vapors from paint thinners can cause fumes that are toxic to breathe **(2)**. Many products are found to be potentially hazardous substances in our homes. They consisted of chemical compounds and can poison, corrode, explode, or ignite when they are handled improperly. When they are discarded, these substances are considered household hazardous waste (HHW) and can threaten human and environment health **(3)**.

Methodology

A descriptive design that is using the assessment approach for the period of December 14th 2004 to October 20th 2005. A simple random sample of (336) principal's household is selected throughout the probability sampling approach. These households have become subjects for the study when a clustering technique is employed by which zone is specified around each Health Care Center as being considered the focal point for such technique. Six households are selected from each of the (4) directions of the Health Care Center as North, South, East and West. The whole sample is representing two groups of (192) urban households and (144) rural households with respect to their residential distribution in Baghdad Governorate's Sectors. An assessment tool is designed and constructed through extensive review of relevant literature to the problem that is underlying the study. The tool is comprised of (4) main parts that are presented as demographic Characteristics of households, factors that produce household hazardous waste, awareness towards household hazardous waste and management of such waste. Data are collected through the use of the assessment tool and the employment of the structured interview with each household on individual basis when home-visit is taking place. Test-retest reliability is determined through the computation of Pearson correlation coefficient and Content validity of the instrument is determined through a penal of (11) experts. The data of the present study are analyzed through the application of two statistical approaches; Descriptive Statistical Data Analysis Approach which includes the measurement of Frequencies and Percentages and Inferential Statistical

Data Analysis Approach which presented as Stepwise Multiple Regression Analysis **(4)**.

Results

Table 1. Distribution of the households' Demographic Characteristics of Urban Area

Demographic Characteristics	Frequency	Percentage
1. Age		
15-24	15	7.8
25-34	47	24.5
35-44	49	25.5
45-54	52	27.1
55-64	21	10.9
65-74	5	2.6
75-84	3	1.6
Total	192	100.0
2. Household's Education		
Unable to read and write	19	9.9
Able to read and write	13	6.8
Primary school graduate	46	24.0
Intermediate school graduate	32	16.7
High school graduate	28	14.6
Institute graduate	27	14.1
Collage graduate	26	13.5
Post graduate	1	0.5
Total	192	100.0
3. Type of family		
Nuclear	161	83.9
Extended	31	16.1
Total	192	100.0
4. Socioeconomic status		
Low	16	8.3
Moderate	94	49.0
High	82	42.7
Total	192	100.0

This table reveals that the large number of households of urban area is accounted for middle age (27.1%) (45-54) year, primary school graduates (24%), living with nuclear family (83.9%) and having moderate socioeconomic status (49%).

Table 2. Distribution of the Households' Demographic Characteristics of Rural Area

Demographic Characteristics	Frequency	Percentage
Age		
15-24	12	8.3
25-34	36	25.0
35-44	41	28.5
45-54	30	20.8
55-64	16	11.1
65-74	7	4.9
75-84	2	1.4
Total	144	100.0
2. Household's Education		
Unable to read and write	30	20.8
Able to read and write	27	18.8
Primary school graduate	42	29.2
Intermediate school graduate	22	15.3
High school graduate	9	6.3
Institute graduate	9	6.3
Collage graduate	5	3.5
Post graduate	0	0.0
Total	144	100.0
3. Type of family		
Nuclear	91	63.2
Extended	53	36.8
Total	144	100.0
4. Socioeconomic status		
Low	23	16.0
Moderate	87	60.4
High	34	23.6
Total	144	100.0

This table reveals that the large number of households of rural area is accounted for late young age (28.5%) (35-44) year, primary school graduates (29.2%), living with nuclear family (63.2%) and having moderate socioeconomic status (60.4%).

Table 3. Stepwise multiple regression for the relationship between household's hazardous waste and its aspects

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1. Awareness towards household's hazardous waste	1.167	0.072	0.662	16.152	0.000
2. Factors that produce household's hazardous waste	1.012	0.053	0.543	19.122	0.000
3. Management of household's hazardous waste	1.000	0.000	0.538	17.862	0.000

The findings out of this table reveal that the aspect of awareness towards household's hazardous waste has a greater role to impact upon the household hazardous waste than factors that produce household's hazardous waste and management of such waste.

Table 4. Stepwise multiple regression for the relationship between factors that produce household's hazardous waste and the demographic characteristics of a household's age, education, residential area, type of family, and socioeconomic status

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1. Education	-0.191	0.061	-0.174	-3.128	0.002
2. Type of family	0.730	0.252	0.158	2.897	0.004
3. Residential area	0.481	0.226	0.119	2.131	0.034
4. Age	0.179	0.079	0.118	2.258	0.025

This table depicts that household education, type of family, residential area and age have a significant impact upon factors that produce households hazardous waste.

Table 5. Stepwise multiple regression for the relationship between awareness towards household's hazardous waste and the demographic characteristics of a household's age, education, residential area, type of family, and socioeconomic status

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1. Type of family	1.012	0.263	0.206	3.852	0.000

This table reveals that type of family has only the greater impact upon the household awareness towards hazardous waste.

Table 6. Stepwise multiple regression for the relationship between management of household's hazardous waste and the demographic characteristics of a household's age, education, residential area, type of family, and socioeconomic status

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1. Socioeconomic status	-0.678	0.164	-0.218	-4.127	0.000
2. Residential area	0.839	0.212	0.209	3.952	0.000
3. Education	-0.176	0.060	-0.162	-2.941	0.004

This table indicates that the household's socioeconomic status, residential area and education influence management of household hazardous waste.

Discussion

1. Discussion of the households' demographic characteristics

Analysis of such characteristics presents that the large number of the urban area households are in their middle age (27.1%) (45-54) year and those of the rural area are in their late young age (28.5%) (35-44) year (Table 1 and 2). Household, naturally, starts the role and takes the responsibility throughout her life span when she is and mostly in the middle age for those who are urban area residents. In contrast, rural area households start such a role when mothers and mothers in law would like them to be part of this responsibility at their early age.

In regard to their education the greater number of households' education of both residential areas is primary school graduates (24%) urban and (29.2%) rural ones (Table 1 and 2). Nationwide, most women do not have the opportunity to continue their education due to cultural issues (i.e., sex discrimination) and being married at early age, therefore, they end up with a low level of education, particularly, those in the rural area because they are largely involved in either farming or early marriage.

Relative to their type of family, most of the households of both residential areas are living with nuclear families (83.9%) urban and (63.2%) rural ones (Table 1 and 2). A large number of households prefer not to have extended families due to socioeconomic factors and cultural issues, except, cases of the rural area, who have violated such issues, to generate extended families.

With respect to their socioeconomic status, the large number of the households of both residential areas has an experienced moderate level of socioeconomic status (49%) urban and (60.4%) rural ones (Table 1 and 2). This result has proved that the predominant level of such a state is a moderate one or below that. It represents the nature of our society and is emerging due to the fact that these households may have a single breadwinner.

2. Discussion of the impact of the household hazardous waste's aspect upon environment pollution

Determination of such an impact is examined. Throughout such examination, the findings have indicated that households' awareness towards hazardous waste has a major impact upon the environment pollution (Table 3). This finding presents supportive evidence in which that any increase in the household's awareness towards hazardous waste will definitely promote their capacity to identify factors that produce such waste and efficiently manage this waste. Then, the environment as a whole context will become safe place for living. The relationship between awareness and the environment pollution is supported through that awareness of both kinds of pollution (local pollution and global pollution), among other things, has led to the environmentalism movement, which seeks to limit the human impact on the environment **(5)**.

The next coming aspect that has an impact upon environment pollution is determined as factors that produce households' hazardous waste as being examined in the study (Table 3). This relationship presents the fact that even minimum number of factors that produce household's hazardous waste the probability of creating polluted environment may increase due to the significant and risky impact of these factors. In regard to factors that produce hazardous waste, it is reported that when leftover paints, pesticides, used oil, pool chemicals, or any other product which is containing potentially dangerous materials are thrown away, they become "household hazardous wastes" **(6)**.

The last coming aspect that can create an impact upon environment pollution is identified as management of household's hazardous waste as being valued in the study (Table 3). It is obvious out of this relationship that management of such hazardous waste can contribute to the phenomenon of environment pollution. This management can be employed through three main methods which include reduce, reuse and recycle. These methods play a major role in

the minimization of environment pollution that results from such waste. It is found that dangers of using household hazardous products may not be a major issue in the public health and environmental health arena, but it does deserve recognition. Improper use, storage, or disposal of hazardous products in the home can cause risks of injury, illness, or even death. To protect not only themselves from harm, but also others and the environment, consumers must take time to learn about the products they use and about how to use them safely [(7)].

3. Discussion of the relationship between factors that produce household hazardous waste and the households' demographic characteristics

Analysis of such a relationship has depicted that the household's education has a major impact upon these factors (Table 4). This presents an evidence in which well-educated households can play a critical role in avoiding such factors from producing hazardous waste as well-oriented individuals toward the risk of this waste. It is noted that improved education on the subject will bring awareness in the rural areas. It will definitely reduce the negative impact of pollution on the ecosystem [(8)].

Nuclear family may produce less household hazardous waste than extended family as it is noted in the study (Table 4). The larger is the family size the higher is the possibility to consume materials that produce such waste.

Crowded, over-crowded and high-density populated area become at a greater risk of developing problem of household hazardous waste because the greater the number of heterogeneous residents the higher the possibility to create a problem of this nature as a result of their life style, attitude and behaviors (Table 4). It is reported that pollutants can be mostly developed as a result of urbanization, modernization, industrialization, and due to the results of human activities. The basic factor in controlling the pollution in Pakistan is the control of population growth, and control the pressure of urbanization [(8)].

Young households may have a greater opportunity than-do old ones in terms of having access to a variety of factors that may produce hazardous waste throughout this segment of their life (Table 4). A study was designed to examine safety concerns and behaviors about the use of hazardous household chemical products such as automotive, cleaning, paint, and pesticide products among residents of a medium-sized, central Illinois town. Safety concern and safety-behavior scores for 350 subjects were based on their responses to questionnaire items relating these products. Residents were only slightly concerned about using hazardous products in the home and do not exhibit safe behaviors with regard to using these products. Statistical analysis showed that younger residents (ages 18-29) were more concerned about the safety of using hazardous products, age had no bearing on behavior [(7)].

4. Discussion of the relationship between awareness towards household hazardous waste and the households demographic characteristics

As a result of such analysis, the type of family is determined to have major impact upon the households' awareness towards such phenomenon (Table 5). This indicates that extended family may share various experiences as being involved in wide-range activities through which their orientation towards this problem is extended.

5. Discussion of the relationship between management of household hazardous waste and the households demographic characteristics

Households' socioeconomic status is found to have a greater impact upon such waste (Table 6). This result presents that households with moderate to low socioeconomic status, particularly, those at poverty level are unable to use appliances or materials or articles that produce wastes which can not be easily managed.

Households, who are living in under crowded areas, are more fortunate to manage such waste appropriately (Table 6). Such a finding is supported by MT [(9)], which reported that the growing waste management problem in the Kingdom of Swaziland could be seen as a symptom of many factors. Consumer patterns, urbanization and population growth should be considered as only one perspective.

In fact, well-educated households are more capable of managing this waste because their opportunity to be informed about this problem is greater than others (Table 6). It is stated in the literature that overtime, these and other barriers will be eliminated through education, partnership initiatives and a strong commitment to pollution prevention. As a society, we can accomplish the most in preventing pollution by educating ourselves and working cooperatively [(10)].

Conclusions

According to discussion and interpretation of the study findings, the study can conclude that Low-educated, being in extended family and living with moderately oriented socioeconomic status has influenced the households' awareness towards households' hazardous waste, identification of factors that contribute to such waste and their management of this waste. Furthermore a confirmation is made with respect to the impact of aspect of households' hazardous waste upon environment pollution as being prioritized as awareness towards household's hazardous waste, factors that produce such waste and management of this waste. Therefore, the study instrument should reformed to be adequate assessment.

Recommendations

Upon the previously stated conclusions, the study recommends that the Public awareness programs can be designed, constructed and presented to households at risk of hazardous waste to increase their awareness towards identification of factors that produce households' hazardous waste and its management. Furthermore Environment pollution programs should be forwarded to low-educated, living in high-density residential area and having low-standardized socioeconomic status households.

References

1. Pepper, L.; Gerba, C. and Brusseau, M.: **Pollution Science**, 1st ed, United Kingdom: Academic Press, 1996, P. 4.
2. Young, J.: **Improving Storage and Handling of Household Hazardous Waste**, North Carolina Cooperative Extension Service, 2000, P. 1.
3. Household Hazardous Waste Collection Facility (HHWCF): **Pollution Prevention: Frequently Asked Questions**, Central Contra Costa Sanitary District, 2003, P. 3.
4. Polit, D. and Hungler, B.: **Nursing Research Principles and Method**, 6th ed, Philadelphia, Lippincott Company, 1999, P.P. 336, 419.
5. Farlex Inc: **Encyclopedia Article about Environmental Pollution**: Hutchinson Encyclopedia, Columbia, 2005, P.1.
6. Household Hazardous Waste Collection Facility (HHWCF): **Pollution Prevention: Household Hazardous Waste**, Central Contra Costa Sanitary District, 2001, P.P. 1-2.
7. Agency for Toxic Substances and Disease Registry (ASTDR): **The International Congress on Hazardous Waste**, Georgia, 1995, P.P. 25-26.
8. Panhwar, F.: **Environmental Pollution in Sindh, Pakistan**, Ecosystem Consulting of Services International, 2005, P.P. 2-17.

9. Ministry of Tourism (MT): **Solid Waste Management Strategy**, Volume 1, Swaziland: Environmental Authority, 2004, P. 8.
10. Office of Compliance Assistance and Pollution Prevention(OCAPP): **What is Pollution Prevention**? Ohio Environmental Protection Agency, 1997, P.P. 1-6.