RESEARCH ARTICLE

•Arch Hyg Sci 2019;8(4):225-231
•Journal Homepage: http://jhygiene.muq.ac.ir

Evaluation of People's Awareness and Practice of Household Waste Management in 2017: A Case Study of Kermanshah, Iran

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A-R-T-I-C-L-EI-N-F-O

Article Notes:
Received: Jul 16, 2018
Received in revised form: Dec 22, 2019
Accepted: Dec 22, 2019
Available Online: Jan 15, 2019

Keywords:
Awareness
Education
Kermanshah
Reduce
Recycling
Waste management

A-B-S-T-R-A-C-T

Background & Aims of the Study: Solid waste management is one of the most daunting environmental challenges. The present study aimed to investigate the awareness and practice of people about household waste management in Kermanshah, Iran.
Materials and Methods: This cross-sectional descriptive-analytical study was carried out on 150 Kermanshah citizens in 2017. Cluster sampling was performed and the data were collected using a researcher-made questionnaire, including awareness, practice, and resources of education for waste management. Finally, the data were analyzed in SPSS software (version18) using ANOVA and t-test at $\alpha = 0.05$.
Results: Citizens' awareness of waste-related diseases and the impact of waste on the environment, the benefits of recycling and reduction in origin were assessed as moderate up to favorable. Nonetheless, the public's performance in relation to the Recycling Agency and the municipality was not favorable. Citizens demonstrated poor practice in terms of household waste management.
Conclusion: From the results of the present study, it can be concluded that conducting training courses, increasing the level of general knowledge and culture in the field of household waste management can improve public awareness and practice.

Please cite this article as: Fattahi H, Yari AR, Mohammadi M, Almasi A. Evaluation of People's Awareness and Practice of Household Waste Management in 2017: A Case Study of Kermanshah, Iran. Arch Hyg Sci 2019;8(4):225-231

Background

The production of solid waste poses a daunting challenge to the health and environment due to their large volume, corruptibility, and social and economic negative consequences(1). Overcrowding, lack of waste disposal facilities, the reflection of pollution, and waste-borne diseases have directed the authorities' attention to this critical problem. Rapid population growth, industrial development, technological advancement, and human inclination to increase consumption as a result of waste generation are among the issues that have recently caused major economic and social crises in societies (2). Moreover, the hazards of unsanitary landfilling, which are now one of the major problems in Iran, can in turn threaten the health of human societies. Therefore, sustainable health plans and policy formulation can resolve the serious problems

caused by unsanitary landfilling, such as gas production and distribution, leachate generation, and infiltration into groundwater and surface water resources (3). The development of waste management systems is of utmost importance to control the production, consumption, and saving of materials, as well as the process of collection and disposal. Solid waste management must comply with health, economics, and environmental engineering and be consistent with other general conditions of the community. The level of public involvement is one of the most important factors in waste management. It requires awareness of solid waste management and recycling (4). On the other hand, people's participation is the prerequisite for the success of any health program, without which health planning cannot be guaranteed. Babaei et al. (2015) conducted a study on the awareness and performance of 2400 housewives in solid waste management in Abadan in terms of a decrease in origin, separation, and recovery. The results of the mentioned study indicated that the participants had a good awareness of source separation and recycling plan; however, they demonstrated poor performance in this regard (5). In addition, the results of a study performed by Safdari et al. in 2013 revealed that awareness and practice of women about recycling solid material were acceptable. Nonetheless, putting greater emphasis on educational aspects, especially by municipalities, and the creation of collaborative and family-based incentives can lead to better performance on the part of women (6). The most important factor in achieving proper solid waste management is cooperation and public participation. Moreover, women play a leading role in home management regarding this critical issue. Consequently, it is imperative to conduct research on people's awareness and performance in Kermanshah. With this background in mind, the present study was conducted with these priorities.

Materials & Methods

This cross-sectional descriptive-analytical study was conducted in Kermanshah, Iran, in 2017. The participants were selected from five districts of the city: north, south, east, west, center, and 30 subjects were selected from each district by simple random sampling method. The research-made questionnaire contains three sections: demographic information (age, education, marital status, number of children, and occupation), awareness, and practice regarding solid waste management at home. The awareness section (13items) included 5 subject: 1) The most appropriate title to classify waste components, 2) Solid waste impact on human health and environment, 3) The best way to store waste at home, 4) Waste separation at source, and 5) Knowledge of the existence of Urban Recycling Organization. Each correct response was scored 1 and false awareness had a score of 0. Moreover, 5 subjects were evaluated in the performance section (31 items): 1) Use disposable containers, 2) Types of waste produced, 3) Waste separation at source, 4) Timely delivery of waste, and 5) Communication with the Recycling Organization. The correct and false performance had scores of 1 and 0, respectively. Finally, a question was added about the source of information about solid waste management. To rank awareness and practice, >33.3% was regarded as poor, 33.4%-66.6% as moderate, and 66.7%-100% as good. In this questionnaire, tool validity is measured using content validity. In this respect, the questionnaire was presented to 5 faculty members of the Faculty of Health in order to determine the goals, the target population, and the subject of the present research. The test-retest method was used to determine reliability and Cronbach's alpha coefficient was utilized to test the reliability of the questionnaire. The coefficients obtained for each question were within the range of 0.8-1. The questionnaires

were completed by interviewing and self-reporting by a trained expert. Upon the completion of the questionnaires, the data were analyzed in SPSS software (version 18) using ANOVA and t-test at $\alpha = 0.05$.

Results

The study population consisted of 150 individuals with a mean age of 30.51±2.4 years. 61.33% of subjects were married and 88% of them were housewives. In terms of education, 4% of subjects were illiterate and 32% had a diploma. Demographic characteristics are presented in Table 1.

Table 2 illustrate the awareness and practice of citizen about solid waste management by demographic Specification.

As illustrated by the results of the study, in the awareness section, 37 participants identified the most suitable category for waste components as "wet and dry", 25 subjects as " putrescible and non- putrescible", 69 respondents as "recyclable and non- recyclable ", and 16 women had no comments. Moreover, 45.33% of people regarded unsanitary waste disposal as the cause of intestinal parasites, bloody diarrhea, polio, and tetanus. In addition, 71.33% of them added other negative consequences, such as groundwater and surface water contamination, as well as soil, air, and aquatic death. 66.33% of participants considered gated containers with garbage bag the best method of waste storage at home. According to the obtained results, 66% of the respondents reported the benefits of household waste separation as less land allocation for waste disposal, lower economic costs, less energy consumption in crop production, and reduced water, soil, and air pollution. In addition, 47.33% of subjects were unaware of the existence of a recycling organization in Kermanshah and 10% of them reported that there is no urban recycling organization in Kermanshah. 62%, 45.33%, and 52% of respondents demonstrated extensive knowledge of the benefits of paper, glass, and plastic, respectively. In addition, 54.66% of subjects believed that solid waste, such as paper, cardboard, plastic, and metals should be separated at home, while 30% considered waste collection machines the best place for waste separation. In general, people's awareness was reported to be at a good level (79%).

Table 1) Demographic characteristics of participants in Kermanshah

Parameter		Percent
Marital status	Single	61.33
	Married	38.67
Education	Illiterate	4
	Under diploma	20
	Diploma	32
	Post graduate diploma	7.33
	Bachelor degree	28
	Master degree	8
Job	Employment	34
	Unemployment	66
No. Children	1-3	41
	4-6	6
	7-9	3

In the practice section, 58.66% of people occasionally or rarely used disposable dishes, and only 5.33% always used these dishes. Based on the result, 39.33% of respondents always or most of the time make waste separation, whereas 8.66% of them never separate solid waste. Moreover, 33.23% of subjects always or often received money or goods for separated wastes; nonetheless, 45% of them never did so. In addition, 38% of women reported that separated wastes were collected at their house by recycling agency; however, the response was negative in 40% of cases. Furthermore, 51.33% of subjects occasionally or rarely kept segregated garbage in different colored bags, while 11.33% of them never did so. It is worthy to note that 56% of subjects delivered the waste to the waste

Table 2) Awareness and practice of citizen about household waste management by demographic characteristics

Variable	Parameters	Sig.	Standard error
Age	Awareness Practice	0.031 0.124	0.145
Education	Awareness Practice	0.000 0.046	1.245
Marital status	Awareness Practice	0.251 0.356	0.895
Job	Awareness Practice	0.048 0.115	0.994
Number of children	Awareness Practice	0.384 0.451	2.57

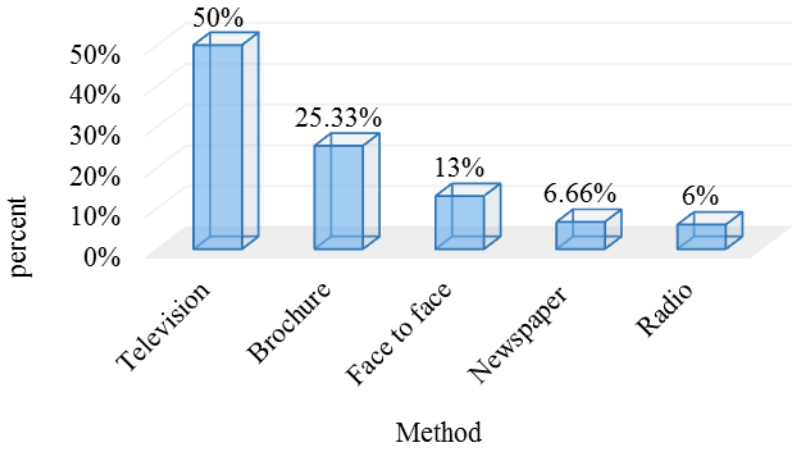

Figure 1) Methods available to the citizen for obtaining information (percent)

collection services on time. In addition, 50.66% of women always wash or disinfect the trash after dumping, while 34.66% do so once or twice a week. Figure 1 illustrates the ways in which women can be educated about solid waste management at home. In a broad sense, the practice of women was poor in the present study. There was a significant difference between awareness and practice.

Discussion

As mentioned earlier, women perform a leading role with regard to household waste management, protection of natural resources, and reduction of environmental pollution. The current study investigated women's awareness and practice regarding solid waste management. The obtained results indicated that the level of respondents' awareness was moderate to good; nonetheless, their performance turned out to be poor.

In the present study, the educational level was statistically correlated with the awareness and practice of participants. In the study conducted by Kheradpisheh et al. (2013) on Bandar Abbas citizens (7), the awareness of municipal solid waste management was statistically correlated with education which is in line with the current study. Paying attention to the positive role of educational level in the promotion of community literacy is an effective way to improve community culture and solid

waste management. Ehrampoosh et al. (2011) conducted a study on knowledge, attitude, and practice of Ramsheh regional about solid waste management (8). The results of their study revealed a significant relationship between awareness and educational level. In a similar vein, a study performed in Sistan and Baluchistan (9) also found a statistically significant relationship between awareness and educational level that confirms the results of the present study. Regarding the age of women in the current study, it can be concluded that there is a statistically significant relationship between age and their level of awareness. Over the past decades, people have experienced no educational restriction in Iran. Contrary to the poor conditions of people over the age of 40, young people have had access to education and training. Due to the differences in lifestyle, young people consider this issue as a matter of personality in society and do not deal with such socially abusive behaviors. They play a more effective role in protecting the environment and the level of awareness in this age range is high.

Nowadays, recycling is recognized as the best way to reduce the amount of waste, reduce general waste disposal costs, and save energy and natural resources. The findings indicated that the performance of Kermanshah Citizens in segregation (bread, paper, plastic, glass, metal, and household hazardous waste) ranged from very poor to moderate which was consistent with the results of the study conducted by Mehdinejad (10). In his study, Abbasi reported that 79% of women did not separate wastes (11), and this value was estimated to be 90% in the study performed by Qonadzadeh et al. in Arak (12). In the studies conducted in Urmia, 77.5% of participants agreed to waste disposal at home (13). In all of these studies, the separation rate at the origin was reported to be greater than the current study. However, there was no segregation in the houses in Khorramabad (14). Impressive results are expected to be achieved by educating and encouraging individuals to appropriately separate waste at source and cooperate with recycling organizations. To this end, it is necessary to educate people, especially housewives, on the proper method of segregation and introduce or provide the necessary facilities. In the present study, 56% of women delivered household waste to waste collection machines on time. The findings of the study performed by Bahrami et al. (15) indicate that 81 people in Rafsanjan performed well in the management of municipal solid waste in terms of timely domestic waste delivery (15). In a study carried out by Mehdinejad et al., it was reported that people in Gorgan, Gonbad, and Aliabad Katol demonstrated moderate to high performance in the timely delivery of household waste (10). The public's involvement and role in these cases will prevent the spread of waste in public passages by animals and different people, thereby promoting public health and reducing waste collection costs (16). Concerning women's information sources, the results demonstrated that the majority of them received their information via television which could be due to their daytime hours and easy access to this source of information. However, the newspaper and radio poorly contributed to waste management education. Continuation of public educational programs plays a significant role in changing social misconduct and encouraging people to observe proper waste management techniques. To this end, appropriate approaches, such as educational technologies, cyberspace, and collective media, should be applied in public education programs. Among the collective media, the internet and television have considerable potential for educating people and require special attention.

Conclusion

In the current study, the participants' level of education was reported to be the most influential parameter in household waste

management; in other words, those with higher education demonstrated better performance. Nonetheless, it was revealed that responsible organizations did not provide sufficient support and training programs. As evidenced by the results of the present study, the majority of participants demonstrated extensive knowledge about waste management; however, their performance was reported to be lower. In addition, it was found that although the municipality had programs to educate people on waste management, these programs were not sufficient and needed to be improved in quantity and content. In addition, the municipality should expand the facilities needed for public participation. Other responsible bodies, especially the Environmental Protection Agency, the Recycling Agency, and the media should also improve their activities in waste management training.

Footnotes

Acknowledgements

Our deepest appreciation and thanks go to the authorities of Kermanshah University of Medical Sciences for their support. Moreover, we extend our special thanks to "Social Development and Health Promotion Research Center", Kermanshah University of Medical Sciences, for making the conduction of this research possible by the provision of invaluable guidance and a research center.

Funding

This work was financially supported by grant: (96266) from Kermanshah University of Medical Sciences.

Conflict of Interest

The authors declare that they have no conflict of interest regarding the publication of this article.

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