



# Knowledge and Attitude Level of Students about Solid Waste Recycling; Kashan University of Medical Sciences

## ARTICLE INFO

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## ABSTRACT

**Aims** Increasing of the population and development of urban areas, has led to solid waste generation increasing which is one of the problems and difficulties that put human and environmental health in danger. The aim of present study was to determine the knowledge and attitude level of Kashan University of Medical Sciences' students about solid waste recycling.

**Instrument & Methods** This cross-sectional study was carried out in the fall of 2012 at the Kashan University of Medical Sciences and all the 250 students studying at nursing, medical, and paramedical schools were participated in it. A researcher-made questionnaire consisting of 20 questions was used to determine the knowledge about and attitude toward solid waste recycling. Data was analyzed by ANOVA, Pearson correlation and independent T test.

**Findings** The knowledge of students was the highest about the definition of recycling (84.4%) and lowest about delivery of recycled materials to badgers (23.6%). Most medical (55.1%) and paramedical (75.3%) students had "weak" and most nursing students (47.1%) had "moderate" knowledge about solid waste recycling. 69.2% of paramedical, 27.3% of medical and 25.5% of nursing students stated that "there is no information about recycling in the university courses".

**Conclusion** Most of the students of Kashan University of Medical Sciences have weak knowledge regarding to solid waste recycling and their knowledge are different among schools.

**Keywords** Knowledge; Attitude; Students; Recycling; Solid Waste

## CITATION LINKS

- [1] Integrated solid waste management: Engineering principles and management issues
- [2] Hazardous waste, impact on health and environment for development of better waste management strategies in future in India
- [3] Investigating households attitude toward recycling of solid waste in Malaysia: A case study
- [4] Household solid waste management in limbecameroun; practices, problems and prospects
- [5] Medical waste management by geographical region in Turkey
- [6] Assess economic and environmental aspects of recycling paper and cardboard waste from the city of Isfahan
- [7] A qualitative and quantitative study the potential recycling of solid wastes in Tehran
- [8] Understanding environmental pollution
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- [10] Medical waste management in Jordan: A study at the King Hussein Medical Center
- [11] Addressing environmental health concerns near Trecatti landfill site, United Kingdom
- [12] Motives as predictors of the public's attitudes toward solid waste issues
- [13] Survey on paper recycling potential in the head offices of Mazandaran province
- [14] Survey of knowledge, attitude and practice of Yazd University of Medical Sciences students about solid wastes disposal and recycling
- [15] Evaluating the quantity and composition of solid waste generated in Kashan during 2009-10
- [16] Evaluation of knowledge of undergraduate students on solid waste management
- [17] Lebanese secondary school students' environmental knowledge and attitudes
- [18] Knowledge, attitude and performance students of shahidsadoughi university of medical sciences-yazd about recycling solid material: A short report
- [19] Survey knowledge and attitudes of students at Zanjan University of Medical Sciences about recycling and separation of solid waste
- [20] A quantitative investigation on recycling attitudes of gifted/talented students
- [21] Evaluating health literacy of Kerman Medical University, School of Public Health students about recycling solid waste
- [22] Exploring secondary school students' understanding and practices of waste management in Ogun State, Nigeria

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## Introduction

Increasing of the population and development of urban areas, has led to solid waste generation increasing which is one of the problems and difficulties that put human and environmental health in danger [1-3]. Not performing the modern methods of collecting and disposal of solid wastes and lack or low level of environmental communities to observe the methods and also numerous types of wastes and executive restrictions in big cities are the main problems of the issue that conquering them can just become possible by increasing the knowledge and attitude level [4-6]. Pollution problems associated with the waste generation have attracted significant attention and a great deal of research has been conducted on these topics [7-10].

A study on landfill wastes in the UK has shown that residents near the landfill complained of odor and health problems [11]. In recycling process, waste materials are changed to new products, which are consumable, by the most effective methods of solid waste recycling [1, 4, 12]. Recycling is one of the best alternatives in solid wastes management [13], which is a closed system with the aim of optimizing the use of resources and to create a greater overall benefit to society by producing less waste. Surveys have shown the importance of management in this process [1, 2, 14]. Organic materials constitute 35-60%, paper and wood 7-9% and plastic 1.5-3.5% of the components of waste materials in Iran [4].

The mean grade of knowledge in boy and girl students of Shahid Sadoughi University of Medical Sciences, Yazd, Iran, was reported 13.53 and 12.38 (out of 20), respectively which has a significant difference and the knowledge of students, as whole, was not appropriate [14]. Solid waste management in areas with dry climates such as Kashan City, Iran, which has low rainfall and groundwater levels, has been neglected. Quantity of the landfill waste of Kashan City, Iran, in 2009 was about 185 tons per day that according to its population is equal to 638g per person per day. About 75% of waste materials of Kashan City, Iran, are corruptible, 11% plastic, and about 5% paper [15].

As the student of universities are the makers of the future of the country and Health system students has the main role of future population health, their knowledge and

attitude about solid waste recycling is very important. To plan well for the future it is necessary to have correct estimate of current situation and due to this it is important to do surveys [16, 17].

The aim of present study was to determine the knowledge and attitude level of Kashan University of Medical Sciences' students about solid waste recycling.

## Instrument & Methods

This cross-sectional study was carried out in the fall of 2012 at the Kashan University of Medical Sciences and all the 250 students studying at nursing, medical, and paramedical schools were participated in it.

A researcher-made questionnaire consisting of 20 questions was used to determine the knowledge (10 questions) about and attitude (10 questions) toward solid waste recycling. Each knowledge question has 1 point. 8 and more points was considered as "good", 5 to 8 points as "moderate" and less than 5 points as "weak". 10 experts and faculty members confirmed validity and reliability was confirmed in a pilot study with 20 students by Cronbach's alpha method as 0.75.

The questionnaires were distributed among all students of each school and were collected after completion.

Data analysis was done in SPSS 20 software using analysis of variance (ANOVA), Pearson correlation and independent T tests.

## Findings

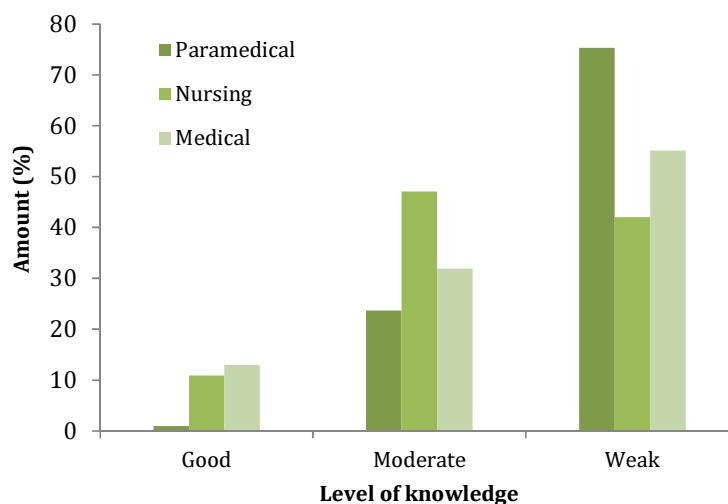
The study sample consisted of 27 males and 223 females with the mean age of 20.4±6.3 years. 92 students were studied at paramedical, 81 at nursing and 77 at medical schools.

84.4% of the students defined the recycling properly, 61.2% were aware of the importance of recycling, and 83% believed that recycling helps the economy. The knowledge of students was the highest about the definition of recycling (84.4%) and lowest about delivery of recycled materials to badgers (23.6%), both not significant between the students of different schools (Figure 1).

Most medical (55.1%) and paramedical (75.3%) students had "weak" and most nursing students (47.1%) had "moderate" knowledge about solid waste recycling ( $p < 0.05$ ; Figure 2).

**Figure 1)** The frequency of correct answers to 10 questions of knowledge about recycling (Numbers in parentheses are percent)

Knowledge Questions	Med.	Nurs.	Paramed.	Total	P Value
1- What is the definition of recycling?	64 (84)	66 (82)	81 (88)	211 (84.4)	0.46
2- What is the importance of recycling aspects?	49 (64)	56 (69)	48 (53)	153 (61.2)	0.064
3- How does recycling help national economy?	64 (83)	31 (39)	78 (85)	173 (69.2)	0.001
4- Which components are found more in solid waste?	44 (58)	35 (44)	58 (63)	137 (54.8)	0.029
5- How much solid waste is produced per capita in Iran?	24 (31)	20 (25)	19 (21)	63 (25.2)	0.29
6- What is the most valuable part of the solid waste?	45 (59)	44 (54)	47 (51)	136 (54.4)	0.63
7- What to do to increase the efficiency of the recycling program?	42 (55)	47 (58)	43 (47)	132 (52.8)	0.31
8- What is the best method of recycling?	40 (52)	37 (46)	28 (31)	105 (42)	0.013
9- What is the use of recycled materials?	51 (67)	65 (80)	46 (50)	162 (64.8)	0.001
10- Do you agree to deliver the recycled material to badgers?	16 (21)	20 (25)	23 (25)	59 (23.6)	0.78



**Figure 2)** The mean results of knowledge of students on the solid waste recycling according to their schools

69.2% of paramedical, 27.3% of medical and 25.5% of nursing students stated that “there is no information about recycling in the university courses”. 31% of the students believed that the best method to encourage people for participating in the recycling of solid waste is “payment in exchange for recyclable materials”, 33% believed in “increasing public awareness”, 20% believed in “distribution of color plastic bags” and 16% believed in “exchange materials with other materials”.

## Discussion

According to the findings of this study, 75% of paramedical, 42% of nursing and 58% of medical students had weak knowledge about recycling. However, due to the number of correct answers given to the questions, the students’ awareness regarding to the importance of recycling was good (61.2%), but making the students aware of the solid

waste recycling program in needed. 44% of Amir-Kabir University of Technology students have moderate and only 3% have good knowledge regard to the management of solid waste. In addition, 5% of them have no knowledge in this field [16]. The mean of knowledge score of Shahid Sadoughi University of Medical Sciences, Yazd, Iran, is  $11.36 \pm 2.54$  out of 20, the mean of attitude score is  $25.90 \pm 2.98$  out of 35 and the mean of performance score is  $6.17 \pm 3.12$  out of 8. Safdari *et al.*, have also reported a direct and positive correlation between knowledge and attitude ( $r=0.298$ ;  $p<0.001$ ) [18]. Bagheri Ardabylyan & Islami have conducted the same study on Zanjan University of Medical Sciences’ students and have reported that more than 65% of the students are aware of recycling. They have suggested that in order to succeed in the recycling of solid waste, having an educational program using mass media can be an effective way to increase the

awareness and public participation. Comparison of the above results with our study showed a large difference that is probably due to the differences between the number of samples, level and the courses of the students [19].

According to nearly half of the students, family, media, newspaper and magazines, and schools and universities together can be the best way to acquire knowledge in the field of recycling. Thus, the needs for cooperation between these media are greater than ever and the mass media, e.g. television and radio, can have the greatest impact in this regard. Safdari *et al.* [18] and Bagheri Ardabilyan & Islami [19] have reported radio and television as the greatest source of information about recycling for students.

Ehrampoush & Moghadam [14] and Ugulu [20] have mentioned that according to the students' opinion, the municipality should be in charge of the management of recycling in the society. The findings of our study showed that most of the students did not agree with the role of badgers in the implementation of recycling projects. Maybe the reason is that people would like to receive money in exchange for recycling themselves and not the badgers. Also, other studies have disagreed with recycling of solid waste by badgers and they have agreed to transfer recycling to the municipality [16, 19, 21, 22].

Organizing workshops on solid waste management and recycling at the university level, presenting optional course with the theme of solid waste management in all academic fields, informing through brochures and pamphlets, holding competitions with the theme of solid waste recycling, and organizing scientific visits and familiarity with the problems of waste disposal sites are recommended to raise awareness of the student of Kashan University of Medical Sciences regarding to recycling of solid waste:

## Conclusion

Most of the students of Kashan University of Medical Sciences have weak knowledge regarding to solid waste recycling and their knowledge are different among schools.

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