



## Investigation on People's Knowledge, Attitude and Operation of Municipal Solid Waste Management in Sanandaj City, Iran

**B. Shahmoradi\* and Seyed Morteza Mousavi Rad\*\***

Faculty of Environmental Health Engineering, Kurdistan University of Medical Sciences, Iran

\*Current address: DOS in Environmental Science, University of Mysore, Mysore, India

\*\*DOS in Geology, University of Mysore, Mysore, India

### Key Words:

Solid waste management  
Municipal solid waste  
Sanandaj City  
Garbage

### ABSTRACT

One of the most important environmental and healthy aspects is producing the kind of solid wastes, especially garbage, which due to its high volume, decay ability, and social and economical problems has a special site. Due to deficiency of the solid waste disposal facility, pollution and solid waste-borne diseases have been caused despite developing of solid waste management. Since producing stage has a basic role in solid waste management, we should not forget the producer site. Based on this, it was decided to carry out this research in the form of survey by questionnaire, which was completed by samples of the community. The conclusions of the research showed that 23 percent had good knowledge, 49 percent medium knowledge, and remaining had weak knowledge. In attitude questions, it was found that 36 percent people had good attitude, while the medium and weak attitude of was 54 percent and 10 percent respectively. But in operation part, only 4 percent had good operation knowledge, while the medium and weak operation knowledge was 22 percent and 74 percent respectively. Based on the above, it was figured out that the majority of Sanandajian had good attitude but weak knowledge and operation, which were not compatible. Therefore, it is suggested that the knowledge and operation levels of the community can be increased by good educational programmes by related organs and by the media.

### INTRODUCTION

Attention to the environment, especially to the community solid waste, during the recent years has brought about the global attention. Rapid growth rate, industrial development, advanced technology and consumerism have led to more garbage production resulting in huge economical and social problems in human society (Omrani 1998). Municipal Solid Waste Management (MSWM) consists of production, storage in situ, collection, transportation, processing, recovery and disposal. These components are linked to each other like a chain, and by a precise and compiled planning must be attached in such a way that is applicable in a unique management system (Abduli & Majlesi 2001). Since improper disposal of solid waste can result in health problems, and environmental and economical losses, a powerful management system may play an important role in reducing the above shortages.

Setting up solid waste collection and disposal management system is one of the approaches which play a major role in production, control, material consumption and economy. The yield of this schedule depends on the health, economy and environmental engineering and must be coordinated with other community general conditions (Majid 1995).

Inattention to collection and disposal of solid waste in modern community due to the various qualities and quantity of materials, immethodical development of cities, authorized limitation for public services in metropolises and lack of suitable technology, has caused special problems. Its elimination is possible only through coordinating of science and experience in a suitable management frame (Kaynezhad 1999). What is clear is that by encouraging the people to reduce solid waste production through avoiding the lavishing and dissipation, and segregating the recoverable components of solid waste at the production centres can result in better solid waste management.

The Sanandaj city, located in the west of Iran, has mountain climate with a population of around 4,00,000. The solid wastes are collected from production centers with the help of carts and pickup vehicles and transferred to the unhealthy temporary stations in different areas of the city, and from there transported to the disposal site at 13 km the south of Sanandaj. It must be mentioned that in some cases, the garbage is directly displaced from production site to the disposal site.

## MATERIALS AND METHODS

The survey was conducted by using questionnaires containing questions related to the sources of solid waste production, collection method and storage of solid waste, solid waste components, solid waste-borne diseases, individual practice, knowledge of collection hour, etc.

In the survey the statistical space was 500 cases and the random sampling was taken from various zones of the city as 10 strata, each stratum containing 50 cases. The required data were collected by referring at the door of the reference services, the knowledge, attitude and operation questions were involving 5, 5 and 8 respectively. The method of scoring was based on the number of correct answers in each part of questionnaire.

## RESULTS

The results of the study are presented in Figs. 1-9. The survey showed that 23 percent of the people had good knowledge, 49 percent medium knowledge, and 28 percent weak knowledge about the most sources of solid waste in the city. In the case of collection and storage method of municipal solid waste, 65 percent had obtained knowledge from family, 19 percent from friends and neighbours and other 16 percent through media (newspaper, radio, TV, etc.), and 25 percent had knowledge about solid waste-borne diseases and another 48 percent had not such information.

In attitude part, 10 percent of the individuals had weak attitude, 54 percent had medium, and 36 percent had good attitude. Among these people 47 percent were agree with the separation of solid waste at the production *in situ*, while 53 percent were disagree with it. Relating to the suitable time of solid waste collection, 66 percent of the individuals agree with at night collection, 29 percent in the early morning and only 5 percent were with collection at noon. 95 percent preferred daily collection, and 5 percent with 3 times a week.

In operation part, 74 percent were weak, 22 percent were medium, and 4 percent had good practice. It was indicated that 30 percent of the individuals use cover for storage of waste, 16 percent use only dustbin and 54 percent use cover keeping in dustbin. 62 percent were agreeing with separation component in house (production *in situ*) and 38 percent did not separate waste in house. 68 percent of the individuals did not wash the dustbin after discharging solid waste. There was no disinfection and it was also find out that 70 percent of the individuals do not take any measure related to the lack of service and wait for the next day servicing. 17 percent report to municipal hall and 13 percent transport it to the temporary stations.

## DISCUSSION AND CONCLUSION

In Sanandaj city, solid waste collection is carried out during night hours. The whole material in the plastic covers and dustbins are discharged to the carts or pickup vehicles by street-sweepers, where lack of suitable sites for storing solid waste before referring to street-sweepers (i.e., lack of collapsing water conduit, availability and visibility for municipal cleaning workers and washing the storage site) is one of the important problems. Solid waste after collection from the houses is transferred to the temporary sites by street-sweepers where it is completely unhealthy and open, and exposed to the rodents, animals, hawkers and insects attack till transporting it to the disposal site. This increases prevalence of the solid waste-borne diseases.

Statistical findings of survey show that more than 50 percent of the Sanandajian have little information about different aspects of municipal solid wastes and their attitude about the above aspects is medium but their operation and practice in relation to these features in majority of cases are wrong and even in some cases, the knowledge does not coordinate with the attitude and practice. So it is suggested to enhance the knowledge and practice level of the community by presenting educational programmes through media and related organizations. In case of the role of family, media and neighbours in relation to the education for the proper approach of collection and storage of solid wastes, the people mentioned that the family role as a priority. The survey indicates that women believe in family effects in education as the most important aspect while the men believe in media role as the major priority in education and also from literature point of view, the individuals having degree above the diploma mentioned the media as the most effective method but the people with degree below diploma and the illiterate mentioned the family role as the more effective method.

The survey's findings reflect the fact that in spite of the frequency of individuals for separation and recovery of materials at the home about 38 percent of them do not make any measure for separation of their recoverable refuse. In this case, the women are more serious than men. It was also observed that the group 'A' family (income less than Rs. 5000 per month) from economical point of view (37 percent) in comparison to other two groups were active in this category with the little trend in segregation of materials can be related to the lack of collection of recoverable materials by legal services (municipal hall or other legal agencies). But in the case of storage and its place at home, 47 percent use unsuitable and nonstandard containers (dustbin) and in most cases, the solid wastes were kept in the yard of the house. Most of the individuals were also agree with the washing of dustbins but in practice, they were not like that, and 68 percent of families leave the dustbins as such after discharging the waste. In case of no collection service by the municipal hall, it was indicated that majority of people (70 percent) do not make any measure and were waiting for the next day service by street-sweepers, and few of individuals transfer own solid waste to the temporary stations. The reasons of the above cases can be mentioned as below:

- 1 Lack of information in relating to health
- 2 Low knowledge level
- 3 Tradition, culture and economical situation
- 4 Low level of living standard

Environmental education creates public awareness which will shape the world of the foreseeable future; improving the capacity of people to address environment and development issues, for achieving environmental and ethical awareness, values and attitudes, skills and behaviour consistent with sustainable development and for effective public participation in effective decision making

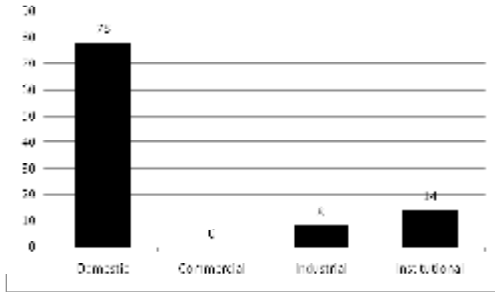


Fig. 1: Frequency percentage of the Sanandajian knowledge about the sources of Solid wastes.

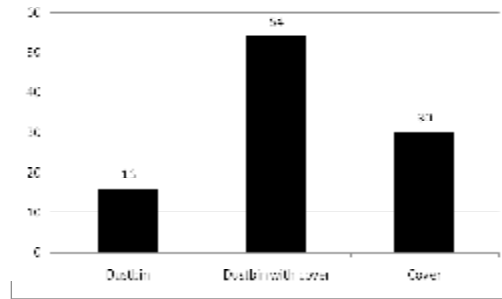


Fig. 2: Frequency percentage of Sanandajian about the solid waste storage methods in house.

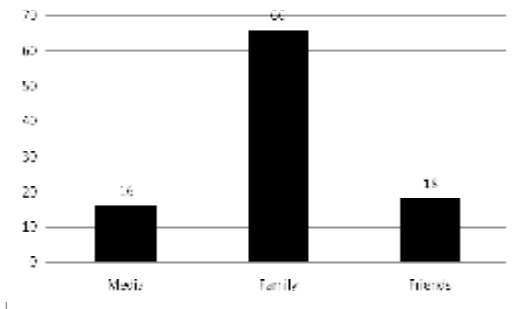


Fig. 3: Frequency percentage of the education role in proper collection and storage of solid waste.

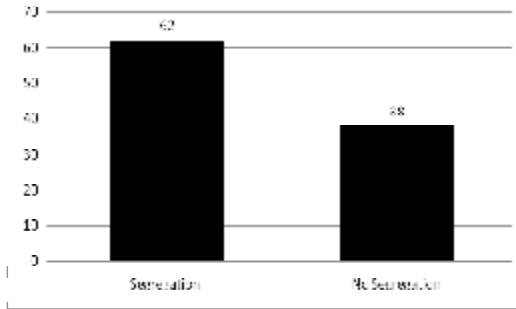


Fig. 4: Frequency percentage of segregation of solid waste in house.

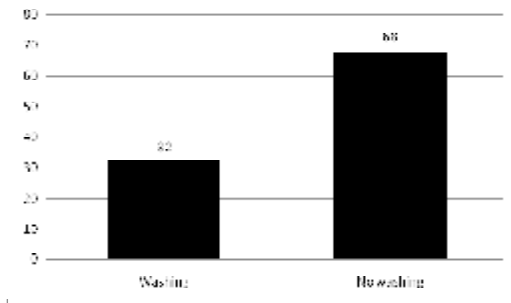


Fig. 5: Percentage of frequency of dustbin washing after discharging.

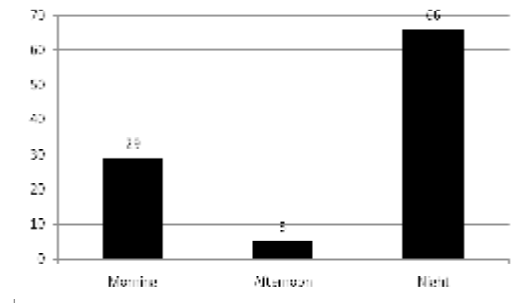


Fig. 6: Percentage of frequency of suitable time for collection of solid waste.

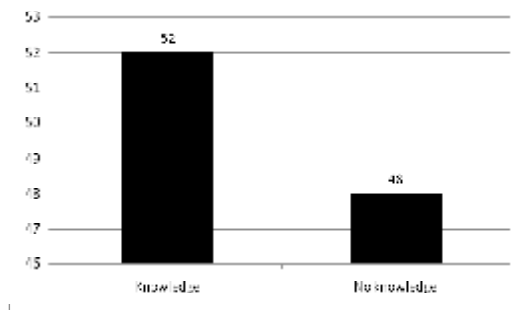


Fig. 7: Frequency percentage of the people's knowledge about solid waste-borne diseases.

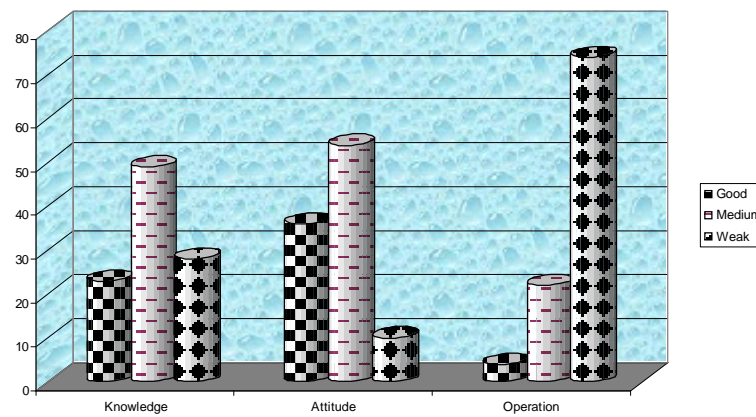


Fig. 8: Percentage of the level of knowledge, attitude and operation of people in relation to collection, storage, transportation and disposal of solid waste.

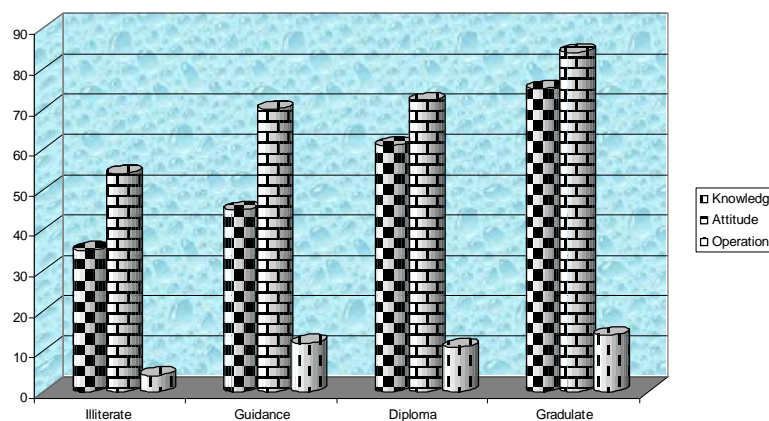


Fig. 9: Percentage of the level of knowledge, attitude and practice of people about the solid waste management based on the literacy.

with a positive personal and social perspective to make earth a beautiful and bountiful semblance. So, by participation of the public and presenting the environmental education to all of the people at different levels needs the stimulation, and it can be suggested by NGOs, Government, Agencies, etc.

## REFERENCES

- Maleki, A. and Omrani, Q. 2002. Investigation of the quantitatively and qualitatively characteristics of the Municipal Solid Wastes and its Management in Hamedan City. 4<sup>th</sup> National Conference on Environmental Health, Yazd.
- Omrani, Q. 1998. Solid Waste: Collection, Transportation, Composting and Management. Vol. 1, Islamic Azad University Publication.
- Abduli, M.A. and Majlesi, M. 2001. SWM, Engineering Principals and Management Aspects. Vol. 1 & 2, Recovery and Recycling Organization of Municipal Hall.
- Majid P. A. 1995. Environmental Engineering. Islamic Azad University.
- Kaynezhad, M.A. et al. 1999. Environmental Engineering. Vol. 2, Sahand Industrial University.