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Research article

INVESTIGATING MANAGEMENT OF WASTE IN GOVERNMENTAL MEDICAL AND HYGIENIC CENTERS OF FARASH BAND'S CITY

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ABSTRACT

Introduction: Growth of urbanization has led to changes in production and components of nosocomial wastes and proper management of repelling solid wastes is an issue that has direct relationship to health and infection's control in society. Although the numbers of these materials are low, but can cause lots of dangers. This study has been done with the aim of determining quantity and quality and also condition of management of wastes at medical and hygienic centers in year 94. **Methodology**: In this descriptive-sectional study that performed at governmental hygienic and medical centers of Farash Band, productive wastes divided into 3 main groups and the condition of wastes management was also investigated on the basis of prepared check list from management's regulation of nosocomial wastes. By using panel regression, the effect of various variables on rate of infectious wastes and all the productive and nosocomial wastes was analyzed. **Results**: Findings of study showed that productive wastes are related to the numbers of referred people and are more than other hygienic and medical centers in hospitals. Although a meaningful relation between the rate of productive and infectious wastes and the numbers of referred people has not been observed, but the rate of productive and infectious waste in hospitals was more than other centers and it was statistically meaningful. **Conclusion**: Daily productions of thousands tons of waste in different areas (of country) and all kinds that they have according to pollution, are an issues that considering population's growth and development of industry and technology should be placed at up to hygiene and environment's plans of the country. According to the importance of this issue, at first items about hygienic dangers, type and the rate of waste and then collection and excretion systems should be noticed.

Keywords: management of waste, hygienic and medical centers, Farash Band, Fars, panel pattern.

INTRODUCTION

Ever-increasing development and growth and industrializing most of the human actions in recent decades, have led to the change in lifestyle and used pattern that this issue causes to increase in production of waste and this increasing in waste collection and excretion have changed it to big challenges including direct and indirect dangers on human health, animals, plants and environment[1]. On one side, this population needs hygienic and medical services that have created construction or development of hygienic and medical areas and then have led to more production of medical waste[2].

Nosocomial wastes according to the law of waste management including all the infectious and harmful wasted due to the process of hospitals activities, hygienic and medical centers and medical laboratories[3]. Management of hospital's wastes includes minimizing wastes and recycling, disinfecting by steam (using autoclave), disinfecting by waves (short, excretion in the city sewage system and so on)[4].

So, lack of control and negligence to proper management of nosocomial wastes about the way of collecting, transportation and sanitary excretion of these wastes can lead to the outbreak of sicknesses and urban and rural epidemics, in addition to critical threat of society's health and environment, they cause lots of

reduction in costs[5] by non-use of required technologies in order to defusing and sanitary excretion, people and related organs are faced with a big challenge. These wastes also because of existence different kinds of microorganisms including staphylococcus, streptococcus, bacillus of tuberculosis and tetanus, hepatitis B (hepatitis B & C), HIV and other pathogens, microbial and infectious mixtures are kind of the most dangerous wastes of urban population [6]. So, controlled and preventive actions in decreasing the production and minimizing dangerous wastes at different hygienic and medical centers, are about fundamental solutions of FAO in developing countries [7,8].

There have been many decades that the management of wastes at hygienic and medical centers has been placed in agenda of countries and pioneer countries have achieved to useful progressions and achievements. In addition to effort for upgrading life's condition, they have also prepared economic context. Despite new methods to excreting nosocomial wastes in many areas of country, excretion of these dangerous wastes also performs by traditional method and excretion. Excretion of nosocomial wastes, in addition to environmental pollutions and groundwater, has the danger of developing some sicknesses. The excretion of nosocomial and infectious wastes by current methods in country have irreversible results and consequences[9]. Nowadays, the best solution related to medical wastes according to the Ministry of Health and Medical Education, is disinfecting wastes by technologies except burning wastes when starting the production[10].

In most of the countries, the excretion of nosocomial wastes performs by disinfecting and sterilizing and this method is replaced excretion of nosocomial wastes by making plasma and incineration device. The excretion of nosocomial wastes by present method and use of incineration because of its pollutions is regarded as a critical crisis. Nowadays, infectious wastes of hygienic and medical centers, clinics and medical diagnosis laboratories and centers including hospitals with urban wastes are eliminated that have big dangers for public health and environment[11].

Nowadays, hospitals produce the most dangerous wastes. The rate of wastes production, relates to lots of factors including climate conditions of area, type of services, income of capitation and hygienic standards of countries. According to this issue, in a country with medium and low incomes, production of waste is lower than countries that their capitation incomes are more. In medical centers that the plan (management of division segments) is performed, the rate of dangerous waste production is lower, than medical centers which do not have management of division segments[9]. Because of not establishing this culture at the first of production and lack of perception this responsibility by managers of medical centers, the rate of nosocomoial waste production in our country is so high, as in recent years according to the increasing growth of that, our big cities have faced with big crises [12].

The purpose of this study is determining the rate of waste and physical features of constitutive segments, the way of managing waste production at medical and hygienic centers and also presenting proper solution for proper management of waste production of centers in Farash Band at year 94.

METERIALS AND METHODS

This study is a sectional investigation which performed by census. The samples included all centers, bases and hospitals of Farash Band. Farash Band Has is a city in the south of Iran with 56000 populations. In this city, there are 1 hospital, 4 medical centers and 4 hygienic bases which are giving necessary services to people. Data related to the rate of waste from each center have been collected by a checklist that was prepared because of this purpose. Data were collected from centers during 2 months and every 2 weeks and totally each center have been calculated 8 times. Analyzing data was done by Excel. In this study, wastes from hygienic and medical centers were grouped to normal wastes or like home and infectious, on the basis of environmental importance and dangerous potential. In this paper, keen instruments, infectious and bloody or other infectious wastes of patient (even low) were broken down as infectious wastes. As the data of study included variable time variable sectional, used estimate is estimating of panel data. By using estimate of random effects, the relation between type of center, number of referred people for to receiving services and type of waste were determined. Estimate of findings related to this study performed by STATA SE v 13.1 software.

RESULTS

The average rate of daily waste is shown in table 1 by separating type of center and waste and number of referred people.

	Total wastes	Infectious	Noninfectious	Number of referred people
Hygienic center	10.52	4.89	5.62	72.93
Hospital	144.68	71.56	73.11	212.125
Hygienic base	5.28	2.68	2.59	25.625

As it is observable in previous table, the most rates of waste production are related to hospitals. These centers have the most rates of infectious and noninfectious wastes, compared with other centers. After that, hygienic centers and bases have the most waste production. In this regard, hygienic bases produce the most proportions of infectious wastes to the total wastes. In table 2, proportion of infectious waste to total wastes, total waste for each referred person and number of referred people by separating type of center, have been shown. As you can observe, hospitals produce the most wastes for each referred person.

Table 2. Descriptive findings of this study related to the rate of waste production.

	Proportion of infectious to total waste	Proportion of infectious to reference	Proportion of total waste to reference
Hygienic center	0.46	0.072	0.15
Hospital	0.49	0.345	0.3243
Base	0.51	0.114	0.219

Table 3 represents result from estimate of panel regression and random effects on total wastes. On the first column the name of variables, on the second column table of their factors and on the third and forth columns respectively standard deviation and significant of factors are placed.

As it is obvious, number of referred people has a positive and meaningful relation to total proactive wastes. The factor of this variable is 0.12. it means that for each reference, 0.12 waste unit produces. The variable of hospital also has a meaningful and positive relation to productive wastes. It means that waste production at hospitals is more than other centers.

Table 3. Results from estimate of panel regression and random effects of total wastes

Variable	Factor	Standard deviation	significant
Number of referred people	0.126867	0.050963	0.013
Type of center			
Hospital	54.2165	3.778683	0.000
Hygienic base	0.761784	3.142998	0.808
Fixed factor	1.268492	3.981083	0.75

Table 4 represents pattern of study for nosocomial and infectious wastes of hospitals. As you can observe, the rate of infectious waste production doesn't have a meaningful relation to the number of referred people, because significance of the factor of referred people number is more than 0.05. If the center is a hospital, it will have positive and meaningful relations with production of infectious wastes.

Table 4. Pattern of study for infectious wastes by hospitals.

Variable	Factor	Standard deviation	Significant
Number of referred people	0.033935	0.029392	0.248
Type of center			
Hospital	33.02605	2.139245	0.000
Hygienic base	-0.60412	1.793504	0.736
Fixed factor	2.418596	2.288518	0.291

DISCUSSION

Findings of study showed that hospitals produce the most wastes and the rate of wastes (whether infectious

or noninfectious) at hospitals are more than other centers. The rate of total wastes has relation with type of center and number of referred people to receiving services [9]. In this case, they have not found relation between number of referred people and rate of infectious wastes. The rate of infectious wastes more relates to type of treatment and sickness of people and presented services at centers than total numbers of referred people to the center. A fundamental issue in nosocomial wastes is the management of this at first, way of collecting, transferring and excreting them. According to this issue that the main problem about nosocomial wastes is non-division of their segments at first of production which a few of hospitals separate them improperly and unsafely by insisting of the Ministry of Health [12,8]. Although the parliament has appointed the collection, transmission and excretion of nosocomial wastes to producers (hospitals), until that hospitals and medical centers by themselves and by contracting to private companies do not perform it, municipality obliged to collect and excrete them [11,13]. However some hospitals do not perform plan of separation of waste segments completely and properly and infectious and normal wastes are collected and packing together. This action causes to increase the rate of work and cost of waste excretion, because organizations of waste management do not sure of infectious wastes separation from normal wastes and inevitably considered all the nosocomial wastes as infectious[14,15]. Furthermore, the costs which organizations of waste management receive from Ministry of Health because of these actions, are not according to services that they present. While 50000 tons of nosocomial wastes daily produce at the country, only 11 hospitals of the country disinfect their wastes. Whereas, according to the resolution of Islamic Consultative Assembly, hospitals are responsible for their productive wastes. They should be responder about their wastes and the way of their burials. Infection in hospital is an issue which is considerable at various aspects and is inspectable according to different points[16]. Collecting and excreting of nosocomial wastes are processes that are effective in limiting or controlling the diffusion of nosocomial wastes in or out of its physical framework and in society. The personnel of hospital and patients and referred people to the hospital easily are affected by this issue and all the people in society randomly and unintended exposed to this [17]. To refusing or minimizing human, social and health harms resulting from improper collection and excretion of nosocomial wastes, at first definition and classification of them are presented, then more secure devices and ways of collection, maintenance, transmission and elimination of them will be investigated. In comprehensive investigation, they try to present necessary interferences [18]. Controlling of solid wastes, toxic and dangerous wastes that some parts of them are nosocomial wastes, is an inevitable action at management of solid and urban wastes [19]. Daily production of thousands tons of wastes at different areas of country with all kinds of pollutions, is an issue that should be considered in health and environmental plans[20]. According to the importance of this issue, at first some items of health dangers, type and rate waste and then collection and excretion systems should be considered. This study had some limitations. The first limitation was lack of more complete data about features of other centers and their effects on wastes. Retrospection of the study was another limitation.

CONCLUSION

We could regard a special interference at the centers and measure its effect on productive wastes. For more studies, it is suggested to investigate type of sickness of referred people and rate of infectious and noninfectious wastes.

REFERENCES

1. Taghipour, H. and M. Mosaferi, Characterization of medical waste from hospitals in Tabriz, Iran. Science of the total environment, 2009. 407(5): 1527-1535.
2. Farzadkia, M., et al., Hospital waste management status in Iran: a case study in the teaching hospitals of Iran University of Medical Sciences. Waste Management & Research, 2009. 27(4): 384-389.
3. Pavan, I., E.H. Hernandez, and E. Pira, Hospital Waste Management, in Sustainable Development and Environmental Management2008, Springer. p. 187-192.
4. Askarian, M., M. Vakili, and G. Kabir, Results of a hospital waste survey in private hospitals in Fars province, Iran. Waste management, 2004. 24(4): 347-352.
5. Arab, M., et al., Report: The assessment of hospital waste management: a case study in Tehran. Waste management & research, 2008. 26(3): 304-308.

6. Patil, A. and A. Shekdar, Health-care waste management in India. Journal of Environmental Management, 2001. 63(2): 211-220.
7. Homaie Rad, E., Z. Kavosi, and M. Arefnezhad, Economic inequalities in dental care utilizations in Iran: Evidence from an urban region. Medical Journal of The Islamic Republic of Iran (MJIRI), 2016. 30(1): 587-592.
8. Damghani, A.M., et al., Municipal solid waste management in Tehran: Current practices, opportunities and challenges. Waste management, 2008. 28(5): 929-934.
9. Abdulla, F., H.A. Qdais, and A. Rabi, Site investigation on medical waste management practices in northern Jordan. Waste management, 2008. 28(2): 450-458.
10. Sabour, M.R., A. Mohamedifard, and H. Kamalan, A mathematical model to predict the composition and generation of hospital wastes in Iran. Waste Management, 2007. 27(4): 584-587.
11. Sawalem, M., E. Selic, and J.-D. Herbell, Hospital waste management in Libya: A case study. Waste Management, 2009.1370-1375 :(4)29 .
12. Chaerul, M., M. Tanaka, and A.V. Shekdar, A system dynamics approach for hospital waste management. Waste Management, 2008. 28(2): 442-449.
13. Almuneef, M. and Z.A. Memish, Effective medical waste management: it can be done. American Journal of Infection Control, 2003. 31(3): 188-192.
14. Samadi, A.H. and E. Homaie Rad, Determinants of Healthcare Expenditure in Economic Cooperation Organization (ECO) Countries: Evidence from Panel Cointegration Tests. Available at SSRN 2286987, 201 3.
15. Cheng, Y., et al., Medical waste production at hospitals and associated factors. Waste Management, 2009. 29(1): 440-444 .
16. Debere, M.K., et al., Assessment of the health care waste generation rates and its management system in hospitals of Addis Ababa, Ethiopia, 2011. BMC Public Health, 2013. 13(1): 1 .
17. Aseweh Abor, P. and A. Bouwer, Medical waste management practices in a Southern African hospital. International journal of health care quality assurance, 2008. 21(4): 356-364 .
18. Delshad, V ,.et al., The Effect of Activating Early Warning System on Motahari Hospital Preparedness. Health in Emergencies and Disasters, 2015. 1(1): 3-8 .
19. Moreira, A. and W. Günther, Assessment of medical waste management at a primary health-care center in São Paulo, Brazil. Waste Management, 2013. 33(1): 162-167.
20. Ferdowsi, A., et al., Certain hospital waste management practices in Isfahan, Iran. International journal of preventive medicine, 2012. 3(3S).