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Laboratuvar Çalışanlarının Tıbbi Atık Farkındalık Durumları

Medical Waste Awareness Status of Laboratory Staff

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ÖZET

Amaç: Tıbbi atık yönetiminin amacı; atığın oluşumundan ortadan kaldırılmasına kadar risk altındaki insanların sağlığını ve çevreyi atıkların tehlikeli ve hastalık yapıcı etkilerinden korumaktır. Bu çalışmada laboratuvar çalışanlarının tıbbi atık farkındalık durumlarının tespiti amaçlandı.

Materyal ve Metot: Çalışmaya Van Yüzüncü Yıl Üniversitesi Tıp Fakültesi Dursun Odabaş Tıp Merkezi Laboratuvar çalışanları (n=30) dahil edildi. Tanımlayıcı tipte bir çalışma olup 25 soruluk anket formu yüz yüze görüşme tekniği kullanılarak uygulandı. Tanımlayıcı istatistikler ve Ki-kare testi kullanıldı. $p < 0.05$ düzeyi istatistiksel olarak anlamlı kabul edildi**.**

Bulgular: Tıbbi atıkların ayrıştırılması ve tıbbi atık yönetimi konusundaki sorulara doğru cevap verme oranları 10 yıldan uzun süre çalışanlarda, tabiplerde ve eğitim düzeyi yüksek lisans/doktora ve üzeri olan grupta anlamlı düzeyde yüksekti ($p<0.05$). Tıbbi atık ile ilgili eğitim alan katılımcı oranı %26.7 oranındaydı ve eğitim aldığını beyan edenlerin ancak yarısı aldığı eğitimi yeterli buldu.

Sonuç: Veriler ışığında tıbbi atık yönetimine ilişkin farkındalığın yeterli olmadığı kanaatindeyiz. Tıbbi atıkların toplanması ve taşınması sürecinde hastane çalışanlarının almış oldukları tıbbi atık eğitimlerini titiz bir şekilde uygulayabilmeleri, tıbbi atıkların sağlık çalışanları ve hastalara verebileceği zararların yanında çevre ve halk sağlığı açısından oluşturduğu riskleri azaltabilmek adına önemlidir. Bu doğrultuda gerekli tedbirlerin alınmasını ve verilen eğitimlerin sürdürülmesini önermekteyiz.

Anahtar Kelimeler: Tıbbi atık, Laboratuvar personeli, Anket.

ABSTRACT

Objective: The purpose of medical waste management is to protect the health of people at risk and the environment from the hazardous and disease-causing effects of waste, from the generation of waste to its disposal. In this study, it was aimed to determine the medical waste awareness status of laboratory staff.

Material and Method: The laboratory staff (n=30) of Van Yüzüncü Yıl University Faculty of Medicine Dursun Odabaş Medical Center were included in the study, which is of a descriptive type, and the 25-item questionnaire was applied by using the face-to-face interview technique. Descriptive statistics and Chi-square test were used. $p<0.05$ was considered statistically significant.

Results: The rates of correct responses to questions about the separation of medical waste and medical waste management were significantly higher in participants who had worked more than 10 years, medical doctors and who had post graduate/doctorate education groups. The percentage of participants who received training on medical waste was 26.7%, and only half of them found the training they took adequate.

Conclusion: In light of the data, we believe that the awareness of medical waste management is not sufficient. The ability of hospital staff to meticulously reflect the medical waste trainings they received in their practices during the process of collecting and transporting medical waste is important to reduce the risks that medical waste poses to health staff and patients, as well as public health. In this respect, we recommend that the necessary measures are taken, and the trainings continue.

Keywords: Medical waste, Laboratory staff, Questionnaire.

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INTRODUCTION

Medical waste is defined as all waste from small or dispersed facilities, such as waste generated during home medical care operations, in addition to waste generated by healthcare institutions, research facilities and laboratories (WHO, 2021). Medical wastes, which are a high-risk waste group, cover a wide range of wastes including infectious, pathological wastes and penetrating and cutting wastes (The Regulation for Control of Medical Wastes, 2017). Medical waste management poses a serious threat to

public health and environmental health in our country as well as to the world (Mathur et al., 2011). In addition to the biological samples coming from the laboratories serving in health institutions, many chemical processes are applied for the analysis of the tests, and a large amount of waste is generated (MoEU, 2017). Medical waste is primarily generated by various places such as hospitals, clinics, medical centers, autopsy institutions, diagnostic and research laboratories, morgues, nursing homes, biomedical companies, blood banks, transfusion centers, dialysis centers, pharmacies, traditional and complementary medical practice centers, houses where treatment services are performed, beauty salons, tattoo and ear-piercing units (Cansaran, 2017; The Regulation for Control of Medical Wastes, 2017; Gözegir, 2018)

In our study, it was aimed to evaluate the knowledge, attitudes and practices of laboratory personnel working with the waste group with high potential for infection and injury.

MATERIAL and METHODS

The study was designed as a descriptive study involving 30 laboratory staff from Van Yüzüncü Yıl University Faculty of Medicine Dursun Odabaş Medical Center. The study was conducted between February 2018 and March 2018. The questions were applied using a face-to-face interview technique with the 25-question questionnaire prepared by the researchers in consideration of the literature (Cansaran, 2017; Ergin et al., 2017; Terzi &Yüce, 2017).

Using IBM SPSS Statistics 22 program, Descriptive statistics and Chi-square tests were applied. $p < 0.05$ level was considered statistically significant.

RESULTS

The average age of the laboratory staff participating in the study was 34.7 ± 9.8. 50% of the participants are male, and 50% are female. 63.3% of the participants were laboratory technicians, 16.7% were medical doctors, and 20% were other health professionals. The rate of participants working in the same unit between 0-5 years is 30%, those between 6-10 years is 23.3%, and those more than 10 years is 46.7%. 16.7% of the participants had high school, 63.3% had undergraduate and 20% had postgraduate/doctorate education (Table 1).

Table 1. Sociodemographic characteristics of the study group

	Category	**Frequency (Percentage)**
Gender	Male	15 (50%)
	Female	15 (50%)
Position	Laboratory Technician	19 (63.3%)
	Doctor	5 (16.7%)
	Others	6 (20%)
Working year	0-5 Years	9 (30%)
	6-10 Years	7 (23.3%)
	>10 Years	14 (46.7%)
Education Status	High School	5 (16.7%)
	Bachelor's Degree	19 (63,3%)
	Master's Degree/Doctorate Degree	6 (20%)

When the data from Table 2 are examined, the question "Do you think you are protected from the effects of medical waste on human health?" was answered with "Yes" by the 66.7% of staff surveyed, while the 33.3% answered "No". For the question "Are you exposed to the risks that medical waste poses to your health?" 40% of participants answered, "I have never been exposed", 40% answered "I am exposed once a week", 10% answered "I am exposed once a month", and 10% answered "I am exposed once or twice a year". While 26.7% of the staff that were surveyed found the general practices of the hospital related to medical waste sufficient, 73.3% found the hospital practices inadequate.

Table 2. Participants' awareness of medical waste management

	Response	**Frequency (Percentage)**
Thinking of Being Protected from the Effects of Medical Waste on Human Health	Yes	20 (66,7%)
	No	10 (33.3%)
Being Exposed to Risks Formed by Waste	Never	12 (40%)
	Once a week	12 (40%)
	Once a month	3 (10%)
	1-2 times in a year	3 (10%)
Adequacy of the Hospital's Medical Waste Practices	Yes	8 (26.7%)
	No	22 (73.3%)
Waste Separation in Every Unit of the Hospital	Waste separation is made	20 (66.7%)
	Waste separation is not made	4 (13.3%)
	I do not know	6 (20%)
Training Status Regarding Medical Waste	Yes, I was trained.	8 (26.7%)
	No, I was not trained.	22 (73.3%)
Adequacy of The Training Received	Adequate	4 (50%)
	Inadequate	4 (50%)

According to the Regulation for Control of Medical Wastes (2017), the Chief Physician of the hospital, who is responsible for medical waste, is the manager or managing director in the absence of the Chief Physician. When Table 3 is examined; 40% of the staff answered, "Chief Physician", 30% answered "Hospital manager", 3.3% answered "Head nurse", 6.7% answered "Cleaning manager", and 20% answered "Other".

According to the Regulation for the Control of Medical Wastes (2017), medical waste must be collected separately from other wastes. 96.7% of participants said 'it is very important to collect medical waste separately from other wastes.

In the center where the study was carried out, medical waste is collected in the temporary waste warehouse. Of the laboratory personnel surveyed, 60% said medical waste was collected in temporary waste storage, 23.3% said it was collected in containers, and 16.7% said they did not know where it was collected.

The collection, transportation and storage of wastes were carried out by hospital's special cleaning staff. The answers to the question about who the authorized person was for collecting, transporting and storing medical wastes between hospital units were 50% "Private cleaning staff", 50% "Hospital cleaning staff".

Table 3. Knowledge and attitude of laboratory staff towards medical waste management workflow

	Response	**Frequency (Percentage)**
Who the Medical Waste Officer is	Chief Physician	12 (40%)
	Hospital manager	9 (30%)
	Head nurse	1 (3.3%)
	Cleaning manager	2 (6.7%)
	Other	6 (20%)
Importance Attached to Separate Collection and Disposal of Wastes	Very important	29 (96.7%)
	Important	1 (3.3%)
	Unimportant	0 (0%)
	I do not know	0 (0%)
Place of Waste Collection	Temporary waste storage containers	18 (60%)
	I do not know	7 (23.3%)
	I do not know	5 (16.7%)
Collecting and Transporting Officers	Private cleaning staff	15 (50%)
	Hospital cleaning staff	15 (50%)
	Nurse	0(0%)
	Other	0(0%)
Officers' Inspection Frequency	Daily	10 (33.3%)
	Weekly	3 (10%)
	Monthly	6 (20%)
	Other	11 (36.7%)
Officials' Changing Frequency	Does not change	5 (16.7%)
	Daily changes	12 (40%)
	Weekly changes	2 (6.7%)
	Monthly changes	1 (3.3%)
	Other	10 (33.3%)
Official's Training Status on Certain Intervals	Training is provided	1 (3.3%)
	Training is not provided	0 (0%)
	I do not know	29 (96.7%)
Transportation Methods of Waste	The Institution's own vehicle	15 (50%)
	Municipal vehicle	10 (33.3%)
	Private company vehicle	5 (16.7%)
Officers' Case of Wearing Special Clothing	Yes	26 (86.7%)
	No	0 (0%)
	I do not know	4 (13.3%)
Regular Collection of Waste	Yes	9 (30%)
	No	0 (0%)
	I do not know	21 (70%)

The frequency of inspections of waste controllers was at least once a day. To the question about the inspection frequency of waste officer, the answers were daily at 33.3%, weekly at 10%, monthly at 20%, and other at 36.7%.

To the question about whether the medical waste officer changed or not, the answers were: "Does not change" at 16.7%, "Daily changes" at 40%, "Weekly changes" at 6.7%, and "Monthly changes" at3.3%.

Regarding whether medical waste officers had been trained or not, 3.3% answered "Training is provided", and 96.7% "I have no information about the issue".

Regarding whether the medical waste collection and transportation team was wearing special clothing, 86.7% of the participants answered "Yes," and 13.3% "I do not know".

The municipality vehicle transports wastes. When asked about by which organizations the medical wastes were transported, the participants answered, "The Institution's own vehicle" at a rate of 50%, "Municipal vehicle" at a rate of 33.3%, and "Private company vehicle" at a rate of 16.7%.

The answers to the question about the process of collecting waste regularly by the municipality teams were 30% "Yes," and 70% "I do not know".

The municipality vehicle transports wastes. When asked about by which organizations the medical wastes were transported, the participants answered, "The Institution's own vehicle" at a rate of 50%, "Municipal vehicle" at a rate of 33.3%, and "Private company vehicle" at a rate of 16.7%.

The answers to the question about the process of collecting waste regularly by the municipality teams were 30% "Yes," and 70% "I do not know".

Laboratory staff correctly answered the question of which color of bag or box the domestic waste was thrown into by saying the black color code at a rate of 90.0 % (Figure 1).

All participants (100%) correctly answered the question of which color of bag or box the medical waste was thrown into by saying the red color code (Figure 1).

The question of which color of bag or box the radioactive wastes were thrown into was answered correctly only by expressing the blue color code at a rate of 43.3%. In this case, 43.3% of the participants were able to answer correctly to all three color codings of domestic waste, medical waste, and radioactive waste (Figure 1).

The question of what types of waste bins are used for sharp waste was answered correctly, with an 86.7% rate, plastic containers (Figure 1).

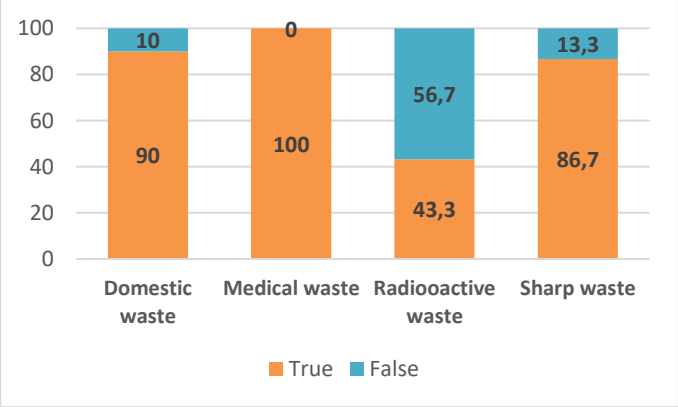

Figure 1. Responses to the color of the bag and boxes of wastes (Percentage %).

The rate of correct answers to questions about sorting medical waste and medical waste management was significantly higher in staff with a working year of more than 10 years. When comparing between genders, the correct answer rates of men were higher than women. The rate of responding correctly to the questions on the disposal of medical waste and medical waste management was significantly higher in who had post graduate/doctorate education. When a comparison was made by profession groups, the rate of physicians to answer correctly to the questions about medical waste disposal and medical waste management was higher ($p<0.05$). The rate of those who answered correctly to all the questions

that can be grouped as true or false among 30 participants is 6.7%.

DISCUSSION

In this study, it was aimed to evaluate the knowledge, attitudes and practices of laboratory staff on waste management. When the responses of the participants were evaluated, it was observed that the majority of them thought that they were not protected from the effects of medical wastes, that they were exposed to the risks posed by medical wastes, and that they did not find the practices related to medical wastes in their institutions to be adequate. It can be thought that the participants' responses in this direction may be related to the low rate of training on medical waste management (26.7%, 8 participants). However, considering that these trainings are actually given to laboratory staff, the reason for the low training rate may be related to the fact that the participants could not remember the training and could not benefit from the training effectively. This result reveals the importance of training to be held at more frequent intervals and to be organized in a way that participants can participate more effectively.

The rate we obtained in our study was quite low, considering a study conducted by Cansaran (2017) with hospital staff where the rate of training was 58.3%. The same rate was 70.7% in a study by Terzi and Yüce (2017) on intern students working at the hospital, or 69.6% in a study conducted in Sakarya on health professionals at hospital by Akbolat et al. (2011), or 42.1% -73.8% for different occupational groups, which was found in the study conducted by the staff of a university hospital in Cairo by Hakim et al. (2014). The low rate of training (training declared by the participants) in this study can be explained by the low number of participants and the inability of the participants to effectively benefit from the training they received.

Laboratory staff correctly answered the question of which color of bag or box the domestic waste was thrown into by saying the black color code at a rate of 90.0%. Medical wastes are durable in rupture, puncture, explosion and transportation processes, have black colored "International Biohazard" emblem on both sides, and must be stored in red plastic bags with having the phrase "ATTENTION! MEDICAL WASTE!" (The Regulation for Control of Medical Wastes, 2017). All participants (100%) correctly answered the question of which color of bag or box the medical waste was thrown into by saying the red color code.

The question of which color of bag or box the radioactive wastes were thrown into was answered correctly only by expressing the blue color code at a rate of 43.3%. When compared to the answers given to the color coding of other waste types, the reason for the low rate of correct answers may be related to the fact that the relevant participants are not generating and transporting radioactive waste in the laboratory section. In this case, only 43.3% of the participants were able to answer correctly to all three color coding of domestic waste, medical waste, and radioactive waste. This rate was observed to be low.

Sharp waste types are different from other medical wastes. They are resistant to puncture, tearing, breaking and explosion situations, and are waterproof and leak-proof, designed not to be opened and mixed, with the black "International Biohazard" emblem and the "ATTENTION! SHARP MEDICAL WASTE!" sign with black letters on them (The Regulation for Control of Medical Wastes, 2017). They must be collected in a box or container made of plastic, or a laminated cardboard that has a plastic function. The question of what types of waste bins were used for sharp waste was answered correctly, with 86.7% plastic containers.

While the rate of knowledge for the waste color coding was 97.6% or 99% for medical waste in the studies conducted (Ergin et al., 2017; Terzi and Yüce, 2017), all the participants in our study answered this question correctly. While the information that sharp wastes should be collected in separate plastic boxes was answered correctly at the rate of 86.7%, this rate

was shown to be 98% in a similar study (Ergin et al., 2017).

The amount of medical waste can be reduced by correctly sorting the waste into bags and boxes suitable for their types. Studies have shown that, if the wastes that should not be thrown into the red waste bin are separated, the amount of medical waste can be reduced by approximately 30% (Kwakye et al., 2011). In a study conducted with hospital healthcare staff, it has been reported that the wastes were re-separated: 61% of them were shown to be wastes that should be in the general waste class. Because of the trainings, the correct application in the separation processes increased by 44%, and the amount (kg) of medical waste in the institution was reduced by a rate of 48% (Johnson et al., 2013).

The rate of correct answers to questions about sorting medical waste and medical waste management was significantly higher in staff with a working year of more than 10 years, medical doctors and who had post graduate/doctorate education groups ($p<0.05$). It is possible to explain this difference such that with the increase in professional experience and education, the level of knowledge on medical waste has increased as well. In order to develop practices for the separation and storage of wastes, it is essential that the staff are trained on this issue. Along with the costs (Küçük, 2013) and legal requirements of the medical waste generation and management process, effective management of medical waste is a social responsibility.

CONCLUSION

In this study, a descriptive questionnaire was conducted in order to evaluate medical wastes, which have the potential to pose a danger to public and environmental health. Among the questions examining the level of knowledge on medical waste, the only question that all participants answered correctly was that medical waste should be collected in red colored bags. The declared rate of training was very low. We believe that facilities that generate medical waste should focus on training and awareness-raising activities in order to improve the practices and habits of their staff, and that institutions should reconsider the issue in the perspective of medical waste production, management, analysis of the relevant approaches, and solutions to the problems

Conflict of interest

The authors declare that there is no conflict of interest.

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