

An analysis on the relationship between safety awareness and safety behaviors of healthcare professionals, Ankara/Turkey

Fatma Uzuntarla¹  | Serhat Kucukali²  | Yasin Uzuntarla³ 

¹Department of Occupational Health and Safety, Cankaya University, Ankara, Turkey

²Department of Civil Engineering, Hacettepe University, Ankara, Turkey

³Department of Health Management, Gülhane Training and Research Hospital, Ankara, Turkey

Correspondence

Yasin Uzuntarla, Department of Health Management, Gülhane Training and Research Hospital, Organ and Tissue Transplantation Coordination Center. 06010 Etlik, Kecioren, Ankara, Turkey.
Email: yasinuzuntarla@gmail.com

Abstract

Objectives: This descriptive study aims to examine the relationship between the safety awareness of healthcare professional and their safety behaviors.

Methods: The study was carried out on 418 healthcare professionals working in a training and research hospital in Ankara/Turkey. The survey method was used as data collection tool. The questionnaire consisted of 3 sections and 18 questions. First section consisted of questions on sociodemographic characteristics and, second section consisted of the awareness scale and third section consisted of safety behaviors scale.

Results: The safety awareness and safety behaviors are scored on a scale from 1 (completely disagree) to 5 (completely agree). The safety awareness and safety behaviors has an average score of 3.85 ± 0.81 and 3.56 ± 0.82 , respectively. The safety awareness and safety behavior levels of healthcare professionals were found to be high.

Conclusion: A significant positive correlation was found between safety awareness and safety behaviors and it was concluded that the increase in safety awareness led to an increase in safety behavior.

KEYWORDS

healthcare professionals, safety awareness, safety behaviors

1 | INTRODUCTION

Employees spend a significant part of their time in workplaces. Therefore, occupation-related tasks need to be at a level that will not be harmful to health of the employees and the work should be performed in a safe environment.¹ However, occupational accidents and occupational diseases, especially in the underdeveloped and developing countries, are still high. This leads to death, disability, economic and social loss, and thus attention on the importance of occupational health and safety.²

Despite the numerous legal regulations governing the prevention of occupational accidents within the context of occupational health and safety, occupational accidents are still high. This has shown that it is not enough to consider this issue only from a technical point of view, but individuals being most important factor in occupational accidents should also be taken into consideration. The fact that approximately 90% of occupational accidents are caused by unsafe behaviors of employees highlights the importance of 'safety culture', regarded as a behavioral regulator.³⁻⁵

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2020 The Authors. *Journal of Occupational Health* published by John Wiley & Sons Australia, Ltd on behalf of The Japan Society for Occupational Health

Safety culture (SC) is the ability of an organization to put safety rules into practice and successfully manage these in all of the activities and operations.⁶ SC was first mentioned in the report prepared after the explosion of the Chernobyl Nuclear Power Plant in Chernobyl, Ukraine, in 1986. Studies have shown that safety culture is actually a subdimension and the reflection of organizational culture.^{7,8} The belief that safety culture significantly effects health and safety increases in addition to the studies on this topic. Factors that constitute SC can be classified as safety priorities, safety communication, safety training, employee participation, fatalism, and safety awareness.⁹

Safety awareness (SA) is the frame of the mind that determines the perceptions and judgments of employees about personal abilities and responsibilities to avoid risks in workplaces.¹⁰ Safety behavior (SB) is the behavior of an individual by safety policies and procedures.¹¹

Hospitals are institutions with hazardous jobs and duties because of their varied specialties, job process, and intense technology usage. Healthcare personnel are always faced with work accident and occupational disease while providing healthcare service. Such dangers in the hospital environment cause a threat toward both health personnel and patients, also leads to medical failures. So, protecting health personnel from these dangers also means protecting patients from medical failures. In order to minimize the potential risks, it is necessary to comply with the accreditation standards in healthcare institutions, to apply quality management systems, to conduct research that reveals the current situation regarding employee health and safety, and to raise awareness of health professionals.¹²⁻¹⁵ When reviewing the literature, such research is very rare and especially in the healthcare sector in Turkey. So, this research is thought to contribute necessary information in this gap.

In the literature, there are some studies that demonstrate the relationship between safety awareness and occupational safety-related behaviors in different sectors such as: textile and metal sectors in Turkey,⁷ food sector in Slovenia,⁹ and manufacturing sector in Turkey.¹⁰ This study aims to examine the relationship between the safety awareness and safety behaviors of healthcare professionals.

2 | MATERIALS AND METHODS

The research was carried out at Gülhane Training and Research Hospital between January and March 2018. Gülhane Training and Research Hospital was one of the most modern tertiary hospitals of the country with 1200 bed capacity, located on Ankara, capital of the Turkey. The hospital currently provides healthcare service to all citizens under the Ministry of Health, once was the country's largest military hospital between 1898 and 2016, served military personnel.

In this study, the sample was not taken, instead, aimed at surveying with all personnel face to face. However, some of the hospital employee could not be reached due to reasons such as permission, patient leave, assignment, and not wanting to participate in the survey. Accordingly, the survey response rate was 35% and 418 healthcare professionals participated to the survey in line with the Helsinki Declaration code of ethics.

2.1 | Questionnaire

Survey method was used as data collection tool in this study. The questionnaire consisted of 3 sections and 18 questions.

2.1.1 | Sociodemographic characteristics

Seven questions were included in this section based on a literature review conducted by the authors: Age, gender, marital status, educational status, monthly income level of the participants, occupation, and term of employment.

2.1.2 | Safety awareness scale (SAS)

SAS developed by Lin et al and adapted to Turkish by Dursun consists of five questions. SAS being a 5-point Likert-type scale has “Completely disagree” scored as 1 and “Completely agree” was scored as 5 points. High scores indicate a high level of occupational safety awareness.^{3,16}

2.1.3 | Safety behavior scale (SBS)

Developed by Neal, Griffin, and Hart and adapted to Turkish by Dursun, SBS consists of two subdimensions as safety compliance (SC) and safety participation (SP) and a total of six questions. SBS is a 5-point Likert-type scale. “Completely disagree” is scored as 1 and “Completely agree” is scored as 5 points. High scores indicate a high level of safety behavior.^{3,17} SC refers to the compliance of personnel to safety principles and rules, and act by safety processes. SP refers to the voluntary participation of personnel in activities, training, and meetings related to safety.^{18,19}

2.2 | Statistical analysis

SPSS (Version 22, Chicago, IL, USA) statistical program was used to evaluate the research data. The arithmetic mean, standard deviation, and frequency analysis were used to analyze descriptive statistics. Kolmogorov-Smirnov test was

used to determine whether research variables' data were normally distributed. Since research variables' data were normally distributed (Kolmogorov-Smirnov test; $P > .05$), multiple linear regression analysis with stepwise method was used to test the relationship between variables. In this multiple linear regression analysis, as a stepping method, probability of F was used with entry threshold: 0.005 and removal threshold 0.010. SBS mean score was taken to the regression model as a dependent variable. SC and SP subdimensions were excluded from the regression model to prevent multicollinearity. SAS mean score, age, gender, marital status, educational status, monthly income level, occupation, and tenure were taken to the regression model as an independent variable. Ordinal sociodemographic characteristics, educational status, monthly income level, and tenure were put into the regression model as they are, however, categorical sociodemographic characteristics, gender, marital status, and occupation, were put in the regression model after converted into dummy variables. $P < .05$ was accepted as a significant level.

3 | RESULTS

Reliability coefficients of the scales were found as 0.86 for SAS, 0.88 for SBS, 0.90 for SC, and 0.82 for SP. Therefore, the scales used in the research are highly reliable. A total of 418 healthcare personnel participated in our research and their sociodemographic characteristics were presented in Table 1. Participants' ages ranged from 18 to 60 years old, with an average of 37.1 ± 8.5 years. Of the participants, 223 (53.3%) were females and 195 (46.7%) were males. Of the participants, 57 (13.6%) were physicians, 150 (35.9%) were nurses, 98 (23.5%) were health technicians, 26 (6.2%) were technical personnel, and 87 (20.8%) were other health personnel.

Scales had the following mean and standard deviation values, respectively: 3.85 ± 0.81 for SAS, 3.56 ± 0.82 for SBS, 3.59 ± 0.95 for SC subdimension, and 3.53 ± 0.88 for SP subdimension. Mean and standard deviation of the scales and subscales were presented along with percentage and frequency participants answers to scale items in Table 2. Participants' safety awareness, safety behaviors, safety compliance, and safety participation levels were found to be high.

According to findings of the multilinear regression model, statistically significant relationships were found between safety behaviors and safety awareness ($F: 593.378; P < .001$). It was also seen that 58% of variance change in safety behaviors mean was explained by safety awareness ($R^2:0.58$). Additionally, increasing safety awareness raises safety behavior positively as well ($\beta: 0.767; P < .001$) (Table 3). However, we found no significant relationships between safety behavior and other independent variables ($P > .05$). Accordingly, those independent variables were excluded from the model.

TABLE 1 Sociodemographic characteristics of the participants

Variable		n(%)
Age (y)	<30	171 (40.9)
	31-40	139 (33.3)
	>40	108 (25.8)
Gender	Female	223 (53.3)
	Male	195 (46.7)
Marital status	Married	261 (62.4)
	Bachelor	157 (37.6)
Educational status	Primary education	16 (3.8)
	High school	25 (6.0)
	University	282 (67.5)
	MSc.	58 (13.8)
	PhD./ Specialist MD.	37 (8.9)
Monthly income	<875\$	125 (29.9)
	875-1500\$	149 (35.7)
	>1500\$	144 (34.4)
Occupation	Physician	57 (13.6)
	Nurse	150 (35.9)
	Health technician	98 (23.5)
	Technical personnel	26 (6.2)
	Other health personnel	87 (20.8)
Tenure (y)	<6	152 (36.4)
	6-10	69 (16.5)
	>10	197 (47.1)

4 | DISCUSSION

Previous studies on safety awareness and safety behavior levels have been carried out on employees in specific industries such as manufacturing, occupational safety, telecommunication, food, construction, metal, and petrochemical.^{3,4,8,9,19-21} This study is unique and important because it is the first study to be conducted in the healthcare sector in Turkey.

The reliability coefficient of SAS used in this study was found to be 0.83 in the original paper and 0.81-0.90 in similar studies. In the original paper, reliability coefficients of SC and SP were 0.94 and 0.85, respectively, and these values were between 0.80-0.95 in similar studies. Our reliability findings were found to be consistent with the results of other studies, which had similarly reliability coefficient higher than 0.80.^{3,16,17,19-21} When the reliability coefficients of the scales were examined, they were found in our study as well as in other studies. We can conclude that the scales are highly reliable and can be used in future studies.

When the mean values of the scales used in our study were examined, it was found that mean values of 3.44-4.17 points (1-5 points) were obtained and these results were consistent with the results of other studies.^{9,20,21} Therefore, it

TABLE 3 Multiple linear regression model of relationships between safety awareness and safety behavior

Regression Model Summary						
R	R Square	f	Sig			
0.767	0.588	593.378	<0.001			
Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.589	0.125		4.711	<0.001
	Safety awareness	0.773	0.032	0.767	24.359	<0.001

a. Dependent Variable: Safety behavior

^aDependent Variable: Safety behavior.

is evaluated that the safety awareness, exhibited safety behaviors, safety compliance, and safety participation levels of healthcare professionals participating in our study are high. In the context of occupational health and safety studies, the fight against occupational accidents is at the forefront and ignoring occupational safety leads to occupational accidents. Occupational accidents in the healthcare sector occur 34% more compared to the figures in other sectors and it shows how important this topic is for the healthcare sector. When the causes of occupational accidents are examined, it is seen that lack of training and experience, and the presence of inappropriate working conditions leading to accidents are among the top causes.²²⁻²⁴ It is highly important to improve working conditions, and to raise awareness of personnel by providing training events in order to prevent and decrease occupational accidents.

There was no significant relationship between sociodemographic characteristics and safety behaviors in our study. Some previous studies reported that men presented more safety behaviors than women, and married individuals exhibited more safety behaviors than single individuals, and individuals with less occupational experience presented more safety behaviors than individuals with more occupational experience.^{21,25,26} While some of the previous studies did not find a significant relationship between sociodemographic characteristics and safety awareness, some studies found that the middle/elderly age group had higher awareness than the younger age group, and women had higher awareness than men.²⁷⁻³¹

In our study, there is a significant relationship between safety awareness and safety behaviors, and as safety awareness increases, the level of safety behaviors also increases. Furthermore, safety awareness explains 58% of safety behaviors. The results of our study are consistent with previous studies and we propose that focusing on safety awareness will contribute to increasing safety behavior levels.³²⁻³⁸

4.1 | Limitations

This research was limited to the healthcare professionals working at Gülhane Training and Research Hospital (Ankara/Turkey), findings of which cannot be generalized with this low participation rate.

The other limitation of this research is that safety behaviors of the participants were measured with their statements in the survey.

5 | CONCLUSION

This study aimed to examine the relationship between the safety awareness and safety behaviors of healthcare professionals.

It was found that the SAS and SBS scales used in our study were highly reliable and could be used in future studies. It was observed that the safety awareness, exhibited safe behaviors, safety compliance, and safety participation levels of healthcare professionals participating in the study were high. A positive and statistically significant correlation was found between safety awareness and safety behaviors. It has been concluded that an increase in safety awareness leads to an increase in safety behavior levels.

Topics related to the importance and priority of occupational safety should be covered in educational curricula and subsequently in orientation and in-service training after graduation to increase the culture and awareness of occupational safety. Thus, safer working conditions will be achieved through personnel with adequate occupational safety awareness upon graduation instead of increasing safety awareness while working and awareness will be further increased by current training events after graduation. Furthermore, when the literature is examined it is seen that studies related to this topic are mainly carried out in the manufacturing and construction sectors. Studies in the healthcare sector are not very

common. It is recommended that more studies should be performed in this field.

ACKNOWLEDGMENT

We would like to thank health personnel who participated in the research helpfully and devotedly without expecting material compensation.

DISCLOSURES

Approval of the research protocol: The necessary permissions were obtained from Cankaya University Ethics Committee (2017/102) and Gulhane Training and Research Hospital Scientific Research Commission (2017/12) for this study. *Informed consent:* Informed written consent was obtained from each participant before starting the study. *Registry and the registration no. of the study:* N/A. *Animal studies:* N/A. *Conflict of interest:* The authors declare no conflict of interests.

AUTHOR CONTRIBUTIONS

FU participated in the design and conception of the study and its coordination, acquisition of data, carried out statistical analysis, and drafted the manuscript. SK participated in the conception of the study and participated in the design of the study, and reviewed analysis and manuscript. YU participated in the design of the study, acquisition of data, and performed the statistical analysis.

ORCID

Fatma Uzuntarla  <https://orcid.org/0000-0001-5718-6940>

Serhat Kucukali  <https://orcid.org/0000-0002-5867-3270>

Yasin Uzuntarla  <https://orcid.org/0000-0002-5021-3763>

REFERENCES

1. Yılmaz E, Ozkan S. The evaluation of health problems and life habits of nurses who works in a district. *Fırat Sağlık Hizmetleri Dergisi*. 2006;1(3):81-99.
2. Cicek O, Ocal M. The historical development of occupational health and safety in the world and in Turkey. *HAK-IS Uluslararası Emek ve Toplum Dergisi*. 2016;5(11):106-129.
3. Dursun S. *An application for the impact on safety performance of safety culture [doctoral dissertation]*. Bursa: Uludag University; 2011.
4. Aytac S, Ozok AF, Yamankaradeniz N, et al. Research on perception of the risk among worker women's of the metal industry at the formation of occupational health and safety culture. *J Eng Sci Design*. 2017;5:59-67.
5. Tomas JM, Melia JL, Oliver A. A cross-validation of a structural equation model of accidents: organizational and psychological variables as predictors of work safety. *Int J Work, Health Org*. 1999;13(1):49-58.
6. Glendon AI, Stanton NA. Perspective on safety culture. *Safety Sci*. 2000;34:193-214.
7. Zopçuk A. *Safety culture assessment in workplaces: study at small and large companies from textile and metal sector [expertise dissertation]*. Ankara: Ministry of the Labor and Social Security; 2015.
8. Boughaba A, Hassane C, Roukia O. Safety culture assessment in petrochemical industry: a comparative study of two Algerian plants. *Saf Health Work*. 2014;5:60-65.
9. Gurbuz H, Ibrakovic H. Work safety, safety performance and safety culture in businesses. *Sobider J Soc Sci*. 2017;4(11):442-469.
10. Dursun S. The impact on safety behaviour of occupational safety culture. *J Soc Security*. 2013;3(2):61-75.
11. Fugas CS, Silvia AS, Melia JL. Another look at safety climate and safety behavior: deepening the cognitive and social mediator mechanisms. *Accid Anal Prev*. 2012;45:468-477.
12. Cebeci H. Work-related accidents and employee safety in the hospitals: an application at Karabuk city centre. *Business Manag Rev*. 2013;1(1):62-82.
13. Devebakan N, Pasali N. Evaluation of service quality standards in health care organizations by health care professionals: a research on Izmir province. *Hacettepe J Health Admin*. 2015;18(2):123-142.
14. Gurer A. Employee safety in health services. *J Health Service Edu*. 2018;2(1):9-14.
15. Loeppke R, Boldrighini J, Bowe J, et al. Interaction of health care worker health and safety and patient health and safety in the US health care system: recommendations from the 2016 summit. *J Occup Environ Med*. 2017;59(8):803-813.
16. Lin SH, Tang WJ, Miao JY, et al. Safety climate measurement at workplace in China: a validity and reliability assessment. *Safety Sci*. 2008;46:1037-1046.
17. Neal A, Griffin MA, Hart PM. The impact of organizational climate on safety climate and individual behavior. *Safety Sci*. 2000;34:99-109.
18. Griffin MA, Xiaowen H. How leaders differentially motivate safety compliance and safety participation: the role of monitoring, inspiring, and learning. *Safety Sci*. 2013;60:196-202.
19. Dursun S, Keser A. Researching the relations between awareness of labour safety and labour safety behaviours: an applied research. *J Labour Relations*. 2014;5(2):1-9.
20. Akalap G, Yamankaradeniz N. The importance and the role of the management to create the safety culture on the companies. *J Soc Security*. 2013;3(2):96-109.
21. Yildiz S, Yılmaz M. Investigation of safety culture level among Turkish construction sector employees and its relation with safety performance. *J Polytech*. 2017;20(1):137-149.
22. Demir T. *Health care employee safety [master thesis]*. Istanbul: Beykent University; 2014.
23. Celikkalp U, Saracoglu GV, Keloglu G, et al. The assessment of work places of nurses on occupational safety. *TAF Prev Med Bull*. 2016;15:1-6.
24. Uçak A. *Evaluation of occupational injuries that health employees exposed to and declaration of them [master thesis]*. Afyonkarahisar: Afyonkarahisar Kocatepe University; 2009.
25. Idrus D, Wahab SRA, Shah IM, et al. How far is transformational leadership relevant to safety performance? *Malaysian Labour Review*. 2009;3(1):74-97.
26. Ocaktan ME. *Assesment of safety culture in an automotive plant [doctoral dissertation]*. Ankara: Ankara University; 2009.
27. Grau R, Martinez IM, Agut S, et al. Safety attitudes and their relationship to safety training and generalised self-efficacy. *Int J Occup Saf Ergon*. 2002;8(1):23-35.

28. Garcia AM, Boix P, Canosa C. Why do workers behave unsafely at work? Determinants of safe work practices in industrial workers. *Occup Environ Med.* 2004;61(3):239-246.
29. Havold JJ. Safety culture and safety management aboard tankers. *Reliab Eng Syst Safe.* 2010;95(5):511-519.
30. Wu TC, Liu CW, Lu MC. Safety climate in university and college laboratories: impact of organizational and individual factors. *J Safety Res.* 2007;38(1):91-102.
31. Mentese G, Ince E, Ozcan B. Investigation of consciousness occupational health and safety in ship construction industry. *Engineer and Machinery.* 2017;58(688):53-78.
32. Evans DD, Michael JH, Wiedenbeck JK, et al. Relationships between organizational climates and safety related events at four wood manufacturers. *Forest Prod J.* 2005;55(6):23-28.
33. Clarke S. The relationship between safety climate and safety performance: a meta-analytic review. *J Occup Health Psychol.* 2006;11(4):315-327.
34. Wu T, Chen CH, Li CC. A correlation among safety leadership, safety climate and safety performance. *J Loss Prevent Proc.* 2008;21:307-318.
35. Hahn SE, Murphy LR. A short scale for measuring safety climate. *Safety Sci.* 2008;46:1047-1066.
36. Lu CS, Tsai CL. The effect of safety climate on seafarers' safety behaviors in container shipping. *Accid Anal Prev.* 2010;42:1999-2006.
37. Wills AR, Watson B, Biggs HC. Comparing safety climate factors as predictors of work-related driving behavior. *J Safety Res.* 2006;37:375-383.
38. Poussette A, Larsson S, Torner M. Safety climate cross-validation, strength and prediction of safety behaviour. *Safety Sci.* 2008;46:398-404.

How to cite this article: Uzuntarla F, Kucukali S, Uzuntarla Y. An analysis on the relationship between safety awareness and safety behaviors of healthcare professionals, Ankara/Turkey. *J Occup Health.* 2020;62:e12129. <https://doi.org/10.1002/1348-9585.12129>