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Perceptions of Patient Safety Culture of Dentistry Students and Dentists in a Faculty of Dentistry

Ayşe Kübra DEMIR* Hatice ULUSOY**

*Sivas Cumhuriyet University Faculty of Dentistry Hospital, aysekubrademir@gmail.com

ORCID Number:0000-0002-2472-1190

**Prof.Dr. Sivas Cumhuriyet University Faculty of Health Sciences Department of Health Management hulusoy@cumhuriyet.edu.tr,

ORCID Number:0000-0002-8911-5490

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Abstract

Aim: Recently, the importance of patient safety culture in dentistry has been discussed. This study aims to evaluate the perceptions of dentists and dentistry students about patient safety culture.

Methods: The population of this cross-sectional study consisted of senior lecturers and research assistants (N=109) and 4th and 5th year dentistry students (N=197) at the Faculty of Dentistry Hospital. 107 dentists and 177 students, agreed to voluntarily participate in the study. Data were collected by using Turkish version of the "Agency for Healthcare Research and Quality Hospital Survey on Patient Safety Culture". SPSS 22 program was used to evaluate the data.

Results: The mean of the total score of the Scale was found as "moderate" (X=2.81). Overall, "teamwork within units" had the highest average (X=3.16), "frequency of event reported " had the

Corresponding author: Hatice Ulusoy, Sivas Cumhuriyet University, Faculty of Health Sciences Department of Health Management, e-mail: hulusoy@cumhuriyet.edu.tr **This paper is part of the first author's (AKD) master's thesis.*

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lowest score (X=2.41). Dentists had a higher average than students in all dimensions except for "teamwork across hospital units," "hospital handoffs and transitions," and "staff." 72.1% of dentists and 66.7% of students have not received any courses or training on patient safety issues. Overall, 83.7% of dentists and 92% of students have not reported any medical errors so far. **Conclusion:**Participants' perceptions of the patient safety culture were “moderate”, that is, the average score of the participants means neither high nor low. It is suggested that hospital managers should establish a more positive patient safety culture.

Keywords: Patient Safety Culture, Dentist, Dental Students, AHRQ, Patient Safety Culture Hospital Questionnaire

Introduction

The concept of patient safety in healthcare has become an increasingly important issue in the literature. The ultimate goal of all health services is to provide safe, effective care (Bailey & Dungarwalla 2021). An important component of health services is patient safety. It is known that strengthening the patient safety culture in health institutions is important for improving the quality of care (Reis et al. 2018). Patient safety aims to prevent healthcare-related errors and reduce the damage caused by these errors. One of the ways to prevent these mistakes in health care is to create a culture of patient safety. The establishment and dissemination of systems related to patient safety culture in health institutions will ensure the establishment of systems to prevent medical errors and thus prevent harm to patients and health workers (Gündoğdu and Bahçecik, 2012)

In 1999, the American Institute of Medicine (IOM) published a report on patient safety and medical errors titled "To Err Is Human: Building a Safer Health System". According to the report, in two studies with hospitalized patients, the incidence of errors during medical care was 2.9% and 3.7%, and 58% and 53% of these errors were defined as preventable medical errors. The report also states that approximately 44,000-98,000 Americans die annually due to medical errors (Kohn et al., 2000). As a result of these striking figures, the World Health Organization (WHO) revealed the importance of medical errors in health services, drew attention to the problem of patient safety with its report published in 2004 and established a patient safety unit. According to the report, in developed countries such as Australia, the UK and Canada, the problem of medical errors or patient safety was more than expected, and these errors were mostly system-related and similar. It also called on all member states to develop strategies in this regard. Thus, practices for patient safety

have begun to be addressed and carried out more systematically worldwide in all areas of health services, including dentistry (WHO, 2004).

Dentistry clearly aims to provide safe dental care for overall health, minimize risks, and establish a culture of patient safety (Pemberton 2014). It is stated that the literature on patient safety culture in dentistry has developed later than the literature in medicine and still needs to be developed (Pemberton 2014; Al-Mahalawy et al (2020). In their systematic review, Ensaldo-Carrasco et al. (2021) concluded that patient safety research is largely unexplored in dentistry. Al-Mahalawy et al. (2020) researched the term "patient safety" in PubMed by the end of June 2019 and found that <1.5% of the publications of patient safety studies were in the field of dentistry. The main reason for this condition is that the overall morbidity and mortality associated with dentistry is less than that of medicine. The harm done to the patient in dentistry may not be as fatal as in medicine, but incidents that threaten patient safety can occur and these can adversely affect the health of the patient (Pemberton 2014; Al Sweleh et al. 2018). Obadan et al. (2015) have shown that adverse events are also common in dental practice. They conducted a retrospective review of dental adverse events reported in the literature. The authors reviewed 270 adverse event cases in which 24.4% of cases caused permanent damage and 11.1% caused patient mortality. Another recent study in Finland identified the two most common types of patient safety events related to dentomaxillofacial radiology as laboratory, medical imaging, or other patient-examination-related events and events related to information flow or control.

In fact, patient safety incidents involving medical errors have become an important issue in dentistry, especially in developed countries (Chohan et al. 2022). In the UK, "false tooth extraction" in 2015 was explicitly incorporated into the "Never Events" (NE) framework by the National Health Service Development (NHSI). NEs Humare defined as events that are classified as a "Serious Event" (SE) type and are fully preventable when all available measures are taken. The NHSI's data indicated that a "false tooth extraction case" was the most commonly reported "never event". (NHS England 2015; Chohan et al. 2022). Yamalik and Pérez (2012) have argued that the nature of adverse events reported in the medical literature is different from those seen in dentistry, and that significant adverse events in dentistry are rarely life-threatening. It was evaluated in 3 main categories as error (40%), accident (20%) and complication (40%). In dentistry, it is of great importance to identify and categorize errors in order to keep application errors at a minimum level and to ensure patient safety. (Kandemir, 1991). Most of the errors in the

oral and maxillofacial surgery unit are related to tooth extraction. Errors such as the roots remaining in the mouth (radix relicta), leaving the cyst formed after extraction, not being able to control the sinus opened after tooth extraction, etc. are among the frequently encountered errors in this unit. Almost all of the errors in the prosthetic dental treatment unit are made during the construction of fixed prosthesis (crown-bridge). However, damage to the pulp during cutting, devitalization of the supporting teeth, fixed prosthesis before the age of 18, problems caused by high fixed prosthesis (temporomandibular joint-TMJ) and damage to neighboring teeth during the preparation of teeth are also common errors in this unit (Halıcı 1990). The most common mistake in the orthodontic unit is the extraction of canine teeth in the vestibule. Replacing the impacted tooth in the arch with another tooth is one of the common errors in this unit (Abuhan, 2014: 8-10). Black & Bowie (2017) worked with 250 dentists and at the end of their study they stated that the following events may be considered as adverse or never events related to dentistry. "*Not checking past medical history; inhaling or swallowing a crown or tool; restore wrong tooth; lack of oxygen and/or emergency medication; allergic reaction due to not checking the medical history; Removal of the wrong tooth; iatrogenic damage to an adjacent tooth; delay in routine shipment; delay in emergency dispatch; using dirty tools; treating the wrong patient*" (Black & Bowie 2017).

When patient safety studies in dentistry are examined on an international basis, dentistry-related organizations such as the World Federation of Dentists (FDI), the European Council of Dentists (CED), the Annapolis Development Center (ADS) and the Safety Asepsis and Prevention Organization - OSAP have taken a number of initiatives to improve the safety of patients receiving services from dental clinics. The Spanish Dental Association (SDA) established the Spanish Observatory for Dental Patient Safety (Observatorio Español de Seguridad del Paciente Odontológico-OESPO) and adopted the nationwide "Dental Clinical Risk Prevention Plan" (Perea-Pérez et al 2020). With this plan, patient safety has become even more important in the field of dentistry.

The determination of quality and accreditation standards carried out within the scope of patient safety studies and oral and dental health in dentistry in Turkey is quite new. In this context, the first step was taken in 2009 and the "Quality Standards in Health-Oral and Dental Health Centers" (SKS-ADSM) set consisting of 51 standards was published. With the regulation made in 2011, these standards were increased to 165. The revised standards in 2015 and 2017 were published as SAS-ADSH booklets through TUSKA in 2018 (TUSEB, 2018). Within these

standards, important concepts such as patient and employee safety committee, employee health, patient and employee safety risk management, negative event notification system, etc. are included.

The concept of patient safety culture in dentistry has been discussed recently (Chohan el 2022). Pemberton (2014) states four strategies to develop safer healthcare **"***1. Identifying threats to patient safety by incident reporting. 2. Evaluating incidents and identifying best practice. 3. Communication and education about patient safety. 4. Building a safety culture, this means a priority is given to patient safety and commitment to overall continuous improvement within the workplace"* (Pemberton 2014). The most widely used tool in the world to measure patient safety culture is the "Hospital Survey of Patient Safety Culture" (HSPSC) developed by the Agency for Healthcare Research and Quality (AHRQ). The questionnaire consists of 12 dimensions. Although scientific studies on patient safety are becoming increasingly widespread, it is seen that most of these studies are carried out with physicians and nurses in hospitals. At the international and national level, there are few studies evaluating the culture of patient safety in dentistry. Developing a safety culture provides tools to manage risks in healthcare organizations. The first step in developing a patient safety culture is to investigate the current situation in an organization (Rizvan et al 2021). The aim of this study is to evaluate dentists and students' perceptions of patient safety culture.

1. RESEARCH METHODOLOGY

Sampling and Data Collection: The population of this cross-sectional study was determined as senior lecturers and research assistants (N=109) and 4th and 5th year students of dentistry (N=197) working at the Faculty of Dentistry Hospital in Sivas, Turkiye. Senior lecturers include assistant professors, associate professors and professors who have completed specialized training in dentistry. Research assistants refer to dentists who continue their specialized training in dentistry. Dentistry 4th and 5th year students are students who take an active part in patient examination and treatment under the supervision of a senior lecturer or research assistant. Questionnaires were distributed to a total of 306 participants. A total of 284 participants, 107 dentists and 177 students agreed to participate in the study. Senior lecturers and research assistants make up the "**dentist**" group, while the "**student**" group consists of 4th and 5th grade students. Dentists and students were given a self-administered questionnaire through face-to-face communication. Participants

were informed about the purpose of the study and their questions, if any, were answered. It was emphasized that the participation in the study was voluntary, and that the data were confidential and private. Participants who did not return the survey were contacted for the second time. The data were collected between 01.12.2019-31.01.2020. The questionnaire was distributed to dentistry 4th and 5th grade students (N=197) and dentists (N=109). Almost all dentists (N = 107) agreed to participate in the study. The participation rate of the students was also quite high, with 177 out of 197 students (N=284) (89.8%).

Data Collection Tools: The data was collected through the "Patient Safety Culture Hospital Survey" (HSPSC) developed by the "Health Research and Quality Agency" (AHRQ) in 2004. The validity and reliability of the Turkish version of HSPSC was realized by Bodur and Filiz in 2010. This is a 5-point Likert scale, consisting of 42 questions and 12 dimensions, consisting of five points (which I strongly disagree with). In the evaluation of the scale, the questions in A5, A7, A8, A10, A12, A14, A16, A17, B3, B4, C6, F2, F3, F5, F6, F7, F9 and F11 were coded inversely. In addition, since the hospital where the research was conducted was a day hospital, two questions related to shift work, F5 and F11, were deleted from the questionnaire and 40 items were applied.

Data analysis was performed with SPSS 22.0. statistics (percentage, mean, SD), "independent t test" were used for the analysis. $P < 0.05$ was used for statistical significance. HSPSC's Cronbach's Alpha was 0.899.

Ethical Issues: Before starting the study, the approval of "Sivas Cumhuriyet University Non-Invasive Clinical Research Ethics Committee" dated 13.11.2019 and numbered 2019-11/26 was obtained. In addition, the necessary written permissions were obtained from the Dean's Office of the Hospital. In addition, written permission was obtained from the author of the scale in order to use the scale in the research.

2. FINDINGS

Table 1 Distribution of Demographic Characteristics of Participants

Age (N= 278)	**Number**	**%**
20-23 years	119	42.8
24-26 years	94	33.8
27-29 years	35	12.6
30+ years	30	10.8
Gender (N= 278)		
Female	164	59.0
Male	114	41.0
Marital Status (N= 278)		
Married	29	10.4
Single	249	89.6
Position (N= 278)		
Faculty Members (Prof., Assoc. Prof. Dr. & Asst. Prof. Dr.)	18	6.5
Research Assistant	86	30.9
Student	174	62.6
School Student Year (N=174)		
4th year	92	52.9
5th year	82	47.1
Working Years of Dentists (N=107)		
Less than 5 years	74	69.2
More than 5 years	30	28.0
No answer	3	2.8
Year of Dentists Working in the Same Hospital (N=107)		
Less than 5 years	83	77.6
More than 5 years	19	17.8
no answer	5	4.6

In Table 1, it is seen that 59% of the participants were women, 89.6% were single, 62.6% were students and 52.9% were 4th grade students. In addition, 69.2% of dentists have been in their profession for less than 5 years and 77.6% have been working in the same hospital for less than 5 years.

Table 2 Participants' Encountering and Reporting a Medical Error

Have you encountered a medical error? (N=278)	**Number**	**Percentage (%)**
Yes	61	21.9
No	217	78.1
Have You Reported the Medical Error You Encountered? (N=61)		
Yes	21	34.4
No	40	65.6
Sum	61	100.0

It was determined that 21.9% (61) of the participants had encountered medical errors in their working life to date, but 65.6% of those who encountered medical errors did not report the medical error they encountered (Table 2).

Table 3 Number of Medical Errors Reported by Participants Regarding Patient Safety

	Number	**%**
Never	247	88.8
1-2 incident reports	21	7.6
3-5 incident reports	8	2.9
11-20 incident reports	1	0.4
Report 20 or more incidents	1	0.4
Sum	278	100.0

It was determined that 88.8% of the participants had not reported any medical errors in their working life to date (Table 3).

Table 4 Status of Patient Safety Training Participants

	Dentist		**Student**	
Have you received any training on patient safety?	N	%	N	%
Yes	29	27.9	58	33.3
No	75	72.1	116	66.7
Sum	104	100	174	100

It was determined that 72.1% of dentists and 66.7% of students did not receive any training on patient safety issues (Table 4).

Table 5 HSBC Average Total Score of Participants and Average Total Score by Dimensions

Dimensions	Min.	Max.	Say	S.D.
General perceptions of patient safety	1.00	5.00	2.98	0.738
Frequency of reported event	1.00	5.00	2.41	0.931
Teamwork between hospital units	1.00	5.00	3.04	0.695
Handoffs and transition	1.00	5.00	2.92	0.869
Executive expectations and actions that promote safety	1.00	5.00	2.76	0.798
Organizational learning and continuous improvement	1.00	5.00	2.79	0.715
Teamwork within units	1.00	5.00	3.16	0.866
Openness of communication	1.00	5.00	2.67	0.845
Feedback and communication about the error	1.00	5.00	3.03	0.766
Non-punitive response to errors	1.00	5.00	2.57	0.722
Personnel	1.25	4.50	3.02	0.492
Management support for patient safety	1.00	5.00	2.64	0.711
Total Points	**1.48**	**4.21**	**2.81**	**0.448**

It was determined that the participants' perceptions of patient safety culture were moderate (X=2.81). The dimensions "Teamwork within units" and "Teamwork between hospital units" had the highest average score, with $\bar{X}$= 3.16 and X = 3.04, respectively, while "reported incident frequency" and "Non-punitive response to errors" had the lowest score with $\bar{X}$= 2.41 and X=2.57, respectively.

Table 6 Perceptions of Participants According to Their Positions According to HSPSC Dimensions

	Participant	N	Say	Standard deviation	t	Df	Sig. (2-tailed)
General perceptions of patient safety	Dentist	104	3.18	0.793	3.712	276	0.000
	Student	174	2.85	0.675			
Frequency of reported event	Dentist	104	2.56	1.054	2.055	276	0.041
	Student	174	2.33	0.840			
Teamwork between hospital units	Dentist	104	2.98	0.782	-1.096	276	0.274
	Student	174	3.07	0.637			
Hospital handoffs and transitions	Dentist	104	2.81	0.932	-1.637	276	0.103
	Student	174	2.98	0.825			
Executive expectations and actions that promote safety	Dentist	104	3.02	0.885	4.227	276	0.000
	Student	174	2.61	0.701			
Organizational learning and continuous improvement	Dentist	104	2.90	0.805	1.912	276	0.057
	Student	174	2.73	0.650			
Teamwork within units	Dentist	104	3.36	0.833	3.068	276	0.002
	Student	174	3.04	0.865			
Openness of communication	Dentist	104	3.03	0.861	5.951	276	0.000
	Student	174	2.45	0.756			
Feedback and communication about the error	Dentist	104	3.20	0.823	2.889	276	0.004
	Student	174	2.93	0.713			
Non-punitive response to errors	Dentist	104	2.70	0.751	2.325	276	0.021
	Student	174	2.50	0.694			
Personnel	Dentist	104	2.95	0.54980	-1.998	276	0.047
	Student	174	3.07	0.45061			
Management Support for Patient Safety	Dentist	104	2.70	0.85005	1.030	276	0.304
	Student	174	2,61	,61357			
Total Points	**Dentist**	**104**	**2.93**	**.504**	**3.616**	**276**	**.000**
	Student	**174**	**2.73**	**.395**			

Table 6 shows that dentists have a higher average score than students in all sizes except "teamwork across hospital units," " hospital handoffs and transitions," and "staff." Participants' perceptions of the dimensions of HSPSC showed statistically significant differences between "Teamwork between hospital units" and "hospital handoffs and transitions".

The results showed that dentists had the highest scores in the dimensions of "Cross-unit teamwork" (X=3.36) and "Feedback and communication about the error" (X=3.20), while they had the lowest score in the dimensions of "reported frequency of events" (X=2.56). Students had the highest scores in the areas of "Teamwork" and "Staff" (X = 3.07) among hospital units, while they had the lowest scores in terms of "reported frequency of incidents" (X = 2.33). The total score of dentists (X=2.93) was higher than that of students (X=2.73) ($p<0.05$).

Additional analyses revealed that there were statistically significant differences between the total score average of the scale and the participants' gender, marital status, working year, length of work in the profession and patient safety culture training ($p<0.05$). In terms of the total score of the scale, the scores of dentists (X= 2.93), married participants (X= 2.99), participants who worked for more than five years (X= 3.17) and participants who received patient safety training (X= 2.90) were higher than the other groups ($p<0.05$).

3. CONCLUSIONS AND RECOMMENDATIONS

This study was conducted with 284 participants, 107 dentists and 177 dentistry students. The aim of this study is to evaluate dentists and students' perceptions of patient safety culture. Participants' perceptions of a culture of patient safety were moderate. Dentists' perceptions of patient safety culture were found to be statistically significantly higher than the students ($p<0.05$). Studies in this area support our findings (Ramoni et al., 2014; Al Sweleh et al. 2018; Al-Surumi et al., 2018; AlOlayan 2020). Al Sweleh et al (2018) conducted a study on dental students, interns, dental assistants, and general dentists using the modified version of HSPSC, similar to our results, the researchers noted that a negative result was obtained in many items of the survey among dental students.

In this study, it was found that "teamwork within units and across hospital units" was the highest average, while the lowest average score was "reported incidence of events" The results of the current study are similar to other studies that found that students and staff at the College of Dentistry in Saudi Arabia had high scores of teamwork within units (Al Sweleh et al 2018). Another study in Pakistan found that teamwork achieved the highest positive response rate (Rizvan 2021). This result may show that the participants are motivated to help each other, to work as a team. Although teamwork had the highest scores, students had lower scores than dentists on the dimensions of "general perceptions about patient safety," "openness of communication,"

"feedback and communication about error," and "Executive expectations and actions that promote safety." It can be said that these are the areas that need to be developed in terms of students' perceptions.

One of the remarkable findings from our study is the number of medical errors reported regarding patient safety. Overall, 83.7% of dentists and 92% of students have not reported any medical errors so far. In addition, the "reported event frequency" dimension had the lowest average score in our study. The results of the current study are similar to other studies (Rizvan et al. 2021; Chohan et al. 2022). While significant adverse events in dentistry are rarely life-threatening, they are also common in dental practice (Yamalık and Pérez 2012, Obadan et al 2015). Pemberton (2014) emphasizes that incident reporting is crucial in the development of patient safety strategies. The author states that the extent of the problems cannot be known without reporting events and learning from mistakes. Reporting any patient safety incidents or errors is important for both the patient and the medical staff. In addition, incident reporting provides a tool to monitor the quality of maintenance. "Personnel reporting" can be used as a tool for the improvement and development of organizational systems and structures.

The reasons for not reporting medical errors in our study were not investigated, but the reasons were identified in similar studies in the literature. Polisena et al. (2015) suggests that the reasons for this are varied. Fear of punishment and time constraints prevent negative events from being identified and reported. One of the reasons why dentists and students do not report incidents may be the fear of being blamed by their colleagues and managers (Çakır and Tütüncü, 2009). A recent study of 104 dentists in the UK asked: "What are the barriers preventing dentists from reporting patient safety incidents? According to the results, "fear of litigation", "loss of professional respect among colleagues", "loss of respect from patients", "fear of repercussions of the General Dental Council/Quality of Care Commission", "fear of losing a job" , time-consuming and unnecessary paperwork' were among the reasons why patient safety incidents were not reported. In addition, 48.1% of dentists stated that they were not familiar with how to report patient safety incidents (Chohan et al. 2022). These findings may indicate that the reasons for not reporting patient safety incidents, including medical errors, remain similar around the world.

In the current study, it was determined that 72.1% of dentists and 66.7% of students did not take any courses or training on patient safety issues. Pemberton (2014) believes that one of the

strategies for developing safer healthcare is to train staff on patient safety. In some studies in the literature, the level of education of the participants on patient safety is high, while the findings of some are similar to ours. In a recent study, the dentist's knowledge of drug safety was insufficient, and targeting dental safety education and training in the undergraduate and graduate faculty of dentistry was strongly recommended to improve patient safety in dental care (Alomi et al. 2021). The low level of education on patient safety in our study may indicate that the reluctance of dentists and students to attend training courses on patient education is mostly due to the fact that this training does not comply with the working days and hours. It can also be said that there are not enough training programs organized by the institution or supported participation. Bailey & Dungarwalla states that the ultimate goal of all health care should be to provide care safely and effectively. The responsibility for protecting and improving patient safety in the field of dentistry belongs to the dentist. They believed that it was necessary for dental professionals to feel competent to address these issues and to have access to the necessary materials to implement tools to improve patient safety. They also need to be confident enough to talk about and contribute to patient safety discussions when things are not as they should be at Bailey & Dungarwalla 2021. For this, dentists and dental students should have sufficient knowledge about patient safety as dentists of the future.

Dentist and dentistry students' perceptions of the culture of patient safety were moderate. However, students' perceptions of patient safety culture were statistically significantly lower than dentists. The percentage of medical error reports was quite low. The majority of participants did not receive any training on patient safety issues. In line with these results, the following recommendations were made. The training and communication needs of dentists and students on patient safety issues should be determined and in-service training should be provided to increase their awareness of these issues. Students studying dentistry, as future dentists and pioneers of the dental profession, should learn all the principles and principles of the concepts of "patient safety culture". "Patient safety" is closely related to all practices in the field of dentistry. Communication and understanding among dental students will allow them to assess their impact on dental care quality and safety in their future careers (AlOlayan et al. 2021) Therefore, as WHO (2011) suggests, patient safety issues should be integrated into health science education, including dentistry, to prepare students for patient safety practices. Finally, we recommend that the

administrators of the hospital where the research was conducted establish a clear patient safety culture, including patient safety incident reporting systems.

The results of this study are limited to a Faculty of Dentistry students and lecturers. It is recommended that similar studies should be carried out, by expanding the population and sample size, in private hospitals, private practices and oral and dental health outpatient clinics. It is thought that the increase and development of the number of studies conducted in this area will contribute to the formation of a patient safety culture in dentistry.

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