



FACTORS AFFECTING PATIENT SAFETY CULTURE AMONG DENTAL HEALTHCARE WORKERS

Majed Ahmed Jarwali^{1*}, Haider Mihsen Ahmad Almakrami², Dalal Abdulrahman Eissa³, Maryam Mohammed Alharqani⁴, Maha Abdulaziz Altaifi⁵, Shahad Esmail Abdullah Pasha⁶, Sara Mohamed Amin Almojaddidi⁷, Sarah Abdulmohsen Alqahtani⁸, Eman Ali Alzahrani⁹, Amjad Omar Mohammad Alsiyud¹⁰, Essam Ibrahim Alghamdi¹¹, Mostafa Abdulwahab Zagzoug¹²

Abstract

Background: Patient safety is a major healthcare challenge. Due to a lack of safety culture knowledge among dental professionals.

The aim of this study: To measure the level of patient safety culture using the Safety Attitude Questionnaire (SAQ-C) and identify factors associated with positive attitudes toward patient safety.

Materials and methods: A cross-sectional survey was conducted on 272 dental healthcare workers, Includes dentists and dental assistants within the dental departments of hospitals in Makkah, Kingdom of Saudi Arabia. The data for the study were collected between January 2022 and March 2020. The survey (SAQ-C) comprised 32 items and reflects five dimensions of patient safety culture. The second section collects demographic information that supposedly affects attitudes toward patient safety. Logistic regression analyses were used to identify factors that supposedly influenced positive attitudes toward patient safety.

Results: Mean SAQ-C scores were significantly higher in respondents who were male, older, dentists, supervisors, and working in clinics. Positive attitudes toward patient safety were found in (55.7%) participants. Multivariate analyses revealed age and place of work are significantly associated with positive safety attitudes.

Conclusion: the study provides important information on patient safety attitudes for dental healthcare workers. Also, provides the current status of patient safety culture and helps raise awareness of it. Most notably, the study identified several factors associated with positive attitudes toward patient safety. The information can be used to improve patient safety in the future.

Keywords: Patient Safety Culture, Dental Healthcare Workers

^{1*,2,3,4,5,6,7,8,9,10,11,12}General Dentistry, Saudi Ministry of Health, Saudi Arabia.

***Corresponding Author:** Majed Ahmed Jarwali

*General Dentistry, Saudi Ministry of Health, Saudi Arabia.

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Introduction

The healthcare environment predisposes patients and healthcare teams to considerable risk factors and hazards⁽¹⁾. An unsafe health environment is a public health problem as it presents adverse events to the patients and staff⁽²⁾. Adverse events are situations where harm is caused to patients unintentionally during treatment and are associated with different factors at the level of individual tasks, teamwork, work environment, or the organization⁽³⁾. A retrospective analysis of medical records of hospital admission from eight countries showed that the prevalence of adverse events was 8.2%, and 83% of these events were preventable⁽²⁾.

Adverse events are also common in dental practice as shown in a study of 270 cases of adverse events where 24.4% of cases resulted in permanent harm and 11.1% inpatient mortality⁽⁴⁾. An understanding of the nature and extent of the adverse events can help prevent or minimize their occurrence in dentistry⁽³⁾. Providing a safe healthcare environment is as important as any other aspect of healthcare because it shows the care, compassion, and attentiveness that healthcare providers have toward their patients⁽⁵⁾. The Institute of Medicine defines patient safety as “the prevention of harm to patients from the care that is intended to help them.”⁽⁶⁾

Patient safety culture is viewed as shared values, perceptions, and competencies that create behavioral norms or practices amongst the members of a healthcare organization for the promotion of safety^(7,8). A positive patient safety culture can help reduce preventable adverse events such as medical errors, complications, and accidents in addition to minimizing unavoidable events in health care^(1,7). The culture of patient safety is not only related to the safe provision of care and patient protection by healthcare teams, but it also has financial, cultural, social, and organizational implications⁽¹⁾.

Patient safety has become a major healthcare challenge since concerns about not harming patients have received increased attention in recent years^(9,10). Numerous studies revealed that high chance of adverse events occurring in general healthcare environments^(11,12), including dental healthcare environments^(13,14). These unintended adverse events can lead to hospital admissions⁽¹¹⁾, prolongation of hospital stays⁽¹²⁾, increased medical expenditures⁽¹⁵⁾, and the occurrence of serious permanent injury or death⁽¹⁶⁾. Evidence from several studies suggested that these adverse events are often preventable and are therefore manageable and avoidable^(11,15,16).

The establishment of a supportive patient safety culture in healthcare organizations is widely accepted to be among the highest priorities for reducing adverse events and improving patient safety as well as quality of care⁽¹⁷⁾. The safety climate generally refers to measurable components of safety culture. Assessment of the patient safety climate for healthcare workers is considered essential as a primary strategy to promote patient safety in organizations^(18,19). The literature on assessing patient safety climate is extensive, especially in terms of general medicine, maternal units, pharmacists, and residential aged care facilities⁽¹⁹⁻²²⁾. However, there is little information dealing with the patient safety climate for dental healthcare workers⁽²³⁾.

In this study, we adopted the Safety Attitude Questionnaire to explore the climate of patient safety among dental healthcare workers, including dentists and dental assistants, and to understand factors that promote positive attitudes toward the patient safety climate. Recognition of factors that affect the patient safety climate will help focus attention on effective efforts to promote patient safety in dental healthcare environments.

Materials and methods

Setting:

A cross-sectional survey was conducted on 272 dental healthcare workers, including dentists and dental assistants within dentistry departments. Includes dentists and dental assistants within the dental departments of hospitals in Makkah Al-Mukarramah, Kingdom of Saudi Arabia. The data for the study were collected between January 2022 and March 2020.

Data collection:

The SAQ-C which measures the patient safety climate among dental healthcare workers. The SAQ has been widely used in several countries⁽²⁴⁻²⁶⁾ and was translated into Arabic version⁽²⁷⁾. Dental healthcare workers who had worked in a study setting for at least 1 month were invited to participate in the survey voluntarily. The SAQ-C is comprised of 32 items and reflects five dimensions of patient safety culture: teamwork climate, safety climate, job satisfaction, perception of management, and working conditions. All patient safety items used a five-point Likert response scale: strongly disagree, slightly disagree, neither agree nor disagree, slightly agree, and strongly agree. The second section of the survey collected demographic information that supposedly affects attitudes toward patient safety. The demographic information included gender, age, level of education, occupation, level of position, job

status, days of work per week, years of experience, and whether or not the worker usually had direct contact with patients. To ensure the reliability and reproducibility of the tool, the questionnaire was pretested through a pilot study on (10%) of dental healthcare workers excluded from study participants. This study was approved by the University Ethics Review Committee. Written informed consent was obtained from all study participants before enrolment in the study.

Statistical analysis

The SAQ-C contains both positively and negatively worded items, the latter were reverse-scored so that a higher score always indicated a more positive perception of the item. Responses to SAQ-C items on the five-point Likert scale were converted to scale scores as follows: strongly disagree Z 0; slightly disagree Z 25; neither agree nor disagree Z 50; slightly agree Z 75; and strongly agree Z 100. A mean score of ≥ 75 on the SAQ-C was defined as having a "positive safety attitude". Frequencies and percentages were used to describe the demographic

information of participants.

For each dimension, the mean and standard deviation of the SAQ-C score were calculated. A one-way analysis of variance (ANOVA) was used to compare mean SAQ-C scores across demographic factors for the five dimensions. Univariate and multivariate logistic regression analyses were used to identify factors that supposedly influenced positive safety attitudes. The odds ratio (OR) and 95% confidence interval (CI) were estimated from the logistic regression model. Statistical significance was defined as $p < 0.05$. All statistical analyses were performed using the SPSS version. 23.0.

Results:

Table (1) shows that (73.8%) were female and 46.7% of participants worked more than 5 days per week. Most participants were full-time workers (88.2%) and had graduated from college (73.5%). Only 14.3% of participants reported having a supervisory position. About half of the participants were dentists (53.3%), and the majority of participants (89.3%) usually had direct contact with patients.

Table (1): Demographic characteristics of the surveyed dental healthcare workers (n= 272)

	NO	%
Gender		
Male	71	26.2
Female	201	73.8
Age (years)		
<31	142	52.4
31-35	45	16.2
>35	85	31.4
Level of education		
Senior high school or below	37	13.6
College	200	73.5
Graduate school or above	35	12.9
Current work		
Occupation Dentist	145	53.3
Dental assistant	127	46.7
Level of position		
Supervisory	39	14.3
Non-supervisory	233	85.7
Job status		
Full-time	240	88.2
Part-time	32	11.8
Days of work per week		
≤ 5	145	53.3
> 5	127	46.7
Years of experience		
<1	72	26.5
1-4	92	33.8
5-10	65	23.9
>10	43	15.8
Direct contact with patients		

	NO	%
Usually	243	89.3
Not usually	29	10.7

Table (2) presents the main results of the SAQ-C scores among dental healthcare workers. The means with standard deviations were 76.3 ± 15.9 for SAQ-C, 78.9 ± 16.3 for teamwork climate, 75.7 ± 15.7 for safety climate, 78.7 ± 19.9 for job satisfaction, 75.0 ± 18.3 for perception of management, and 72.9 ± 20.1 for working conditions. Overall, the mean SAQ-C scores significantly differed in several

factors, such as gender, age, occupation, and level of position. Similar results were also demonstrated within each safety dimension. However, the mean scores of job satisfaction and working conditions did not significantly differ between males and females. The mean scores of perceptions of management and working conditions did not significantly differ for occupation or level of position.

Table (2): Mean scores of the adopted safety attitude questionnaire among dental healthcare workers

SAQ-C Item	SAQ-C	Teamwork climate	Safety climate	Job satisfaction	Perception of management	Working conditions
Overall	76.3±15.9	78.9±16.3	75.7±15.7	78.7±19.9	75.0±18.3	72.9±20.1
Gender						
Male	79.6±15.4	82.4±16.8	79.2±14.5	82.3±18.5	78.9±17.5	75.0±19.4
Female	75.1±15.9	77.7±16.1	74.5±15.9	77.4±20.3	73.6±18.4	72.2±20.4
<i>p-value</i>	<0.05	<0.05	<0.05	0.055	<0.05	0.276
Age (years)						
<31	72.8±15.7	76.3±16.4	72.6±15.4	73.5±20.1	72.1±17.8	69.5±19.2
31e35	80.7±14.0	81.6±15.8	79.9±13.4	83.4±18.1	80.2±16.7	78.5±18.3
>35	79.7±15.9	82.0±15.9	78.8±16.2	84.8±18.2	77.3±19.3	75.8±21.7
<i>p-value</i>	<0.001	<0.05	<0.001	<0.001	<0.05	<0.05
Level of education						
Senior high school or below	75.3±16.6	76.2±18.4	74.1±15.2	77.7±20.5	73.7±18.6	74.7±22.8
College	76.0±15.8	79.1±16.1	75.6±15.8	78.2±20.0	75.2±18.3	72.1±19.7
Graduate school or above	78.5±15.7	80.9±15.3	78.2±15.2	82.1±18.8	75.3±18.7	75.8±19.7
<i>p-value</i>	0.613	0.399	0.480	0.495	0.879	0.454
Occupation						
Dentist	78.5±14.5	81.2±15.9	78.5±13.9	81.1±18.4	76.9±16.5	75.0±18.2
Dental assistant	74.2±16.9	77.0±16.5	73.3±16.7	76.5±21.0	73.4±19.7	71.0±21.6
<i>p value</i>	<0.05	<0.05	<0.05	<0.05	0.097	0.082
Level of position						
Supervisory	82.1±15.0	84.6±17.1	82.2±15.2	87.7±15.1	79.7±18.1	76.5±20.6
Non-supervisory	75.3±15.9	78.0±16.1	74.7±15.5	77.2±20.2	74.2±18.3	72.3±20.0
<i>p-value</i>	<0.05	<0.05	<0.05	<0.05	0.064	0.208
Job-status						
Full-time	76.3±15.8	79.2±16.4	76.1±15.6	78.7±20.0	74.7±18.4	72.8±20.0
Part-time	75.9±16.8	77.4±15.9	72.9±16.4	78.4±19.9	77.1±18.0	73.6±21.2
<i>p-value</i>	0.879	0.534	0.239	0.934	0.463	0.815
Days of work per week						
≤5	76.6±15.2	79.8±15.5	76.0±15.0	79.1±20.1	75.2±17.3	72.7±19.8
>5	75.9±16.7	77.9±17.2	75.5±16.4	78.1±19.7	74.9±19.4	73.2±20.6
<i>p-value</i>	0.721	0.304	0.770	0.667	0.890	0.837
Years of experience						
<1	75.4±15.9	78.0±17.4	75.2±14.7	76.7±19.7	75.4±17.6	71.8±19.8
1-4	76.3±16.9	78.7±16.8	75.3±16.7	78.7±20.3	76.3±18.9	72.6±20.2
5-10	76.1±14.2	79.8±14.2	74.8±14.1	78.4±19.5	73.3±18.2	74.1±18.7
>10	77.7±16.4	79.6±17.0	78.8±17.3	82.3±20.2	74.3±18.7	73.8±22.9
<i>p-value</i>	0.885	0.915	0.521	0.493	0.724	0.891
Direct contact with patients						
Usually	76.2±16.2	78.8±16.8	75.4±14.1	78.6±20.1	74.8±18.5	72.9±20.1
Not usually	76.9±13.9	79.8±12.6	75.8±15.9	79.3±18.9	77.3±16.4	72.7±20.9
<i>p-value</i>	0.809	0.750	0.888	0.852	0.455	0.953

Table (3) demonstrates factors associated with positive safety attitudes were examined by a logistic regression model. Participants aged 31-35 years and >35 years were more likely to have positive safety attitudes (OR, 2.43, 95% CI, 1.25-4.71; OR, 2.79, 95% CI, 1.64-4.75, respectively). Having more than 10 years of experience was also identified as a factor

associated with positive safety attitudes (OR, 2.39, 95% CI, 1.14-5.00). Those in non-supervisory roles were found to have less positive safety attitudes (OR, 0.37, 95% CI, 0.18-0.76). The multivariate analyses identified one significant factor associated with positive safety attitude: age.

Table (3): Logistic regression analyses of characteristic factors associated with the SAQ-C

Variable	Negative attitude	Positive attitude	Univariate odds ratio (95% CI)	Adjusted odds ratio (95% CI)
Gender				
Male	21.2%	30.2%	Reference	Reference
Female	78.8%	69.8%	0.62 (0.37-1.05)	0.91 (0.45-1.83)
Age (years)				
<31	65.7%	41.9%	Reference	Reference
31-35	12.4%	19.2%	2.43 (1.25-4.71)	2.38 (1.11-5.08)
>35	21.9%	39.0%	2.79 (1.64-4.75)	2.39 (1.07-5.37)
Level of education				
Senior high school or below	13.1%	14.0%	Reference	Reference
College	77.4%	70.3%	0.86 (0.44-1.66)	1.25 (0.55-2.83)
Graduate school or above	9.5%	15.7%	1.56 (0.63-3.83)	1.30 (0.42-4.04)
Occupation				
Dentist	42.3%	50.6%	Reference	Reference
Dental assistant	57.7%	49.4%	0.72 (0.46-1.13)	0.68 (0.35-1.32)
Level of position				
Supervisory	8.0%	19.2%	Reference	Reference
Non-supervisory	92.0%	80.8%	0.37 (0.18-0.76)	0.68 (0.27-1.74)
Job-status				
Full-time	86.9%	89.0%	Reference	Reference
Part-time	13.1%	11.0%	0.82 (0.41-1.63)	0.82 (0.37-1.81)
Days of work per week				
≤5	54.7%	52.3%	Reference	Reference
>5	45.3%	47.7%	1.10 (0.70-1.73)	1.63 (0.94-2.85)
Years in the facility				
<1	32.1%	22.1%	Reference	Reference
1e4	34.3%	33.1%	1.40 (0.79-2.51)	1.49 (0.79-2.80)
5e10	21.9%	25.6%	1.70 (0.90-3.21)	1.53 (0.72-3.24)
>10	11.7%	19.2%	2.39 (1.14-5.00)	1.47 (0.51-4.25)
Direct contact with patients				
Usually	90.5%	88.4%	Reference	Reference
Not usually	9.5%	11.6%	1.26 (0.60-2.62)	1.51 (0.66-3.45)

Discussion

This study provides an overall assessment of the patient safety climate among dental healthcare workers using the SAQ-C. Similarly, Leong et al. (2008)⁽²³⁾ measured attitudes towards patient safety among dental faculties, working in clinics of seven US dental schools, using a survey instrument developed by the US Agency for Healthcare Research and Quality (AHRQ)⁽²³⁾. The present study found that the mean SAQ-C scores were significantly higher in workers who were male, an older age, dentists, and supervisors. In addition, our results suggested that age, level of position, and years of experience were associated with dental healthcare workers having positive attitudes toward

patient safety.

The current results indicated that the mean scores for SAQ-C, teamwork climate, safety climate, job satisfaction, perception of management, and working conditions were respectively 76.3, 78.9, 75.7, 78.7, 75.0, and 72.9. All of the safety climate domains in our study except the working conditions domain for dental healthcare workers reached a score of 75, which is considered to indicate a positive attitude. The low scores for working conditions reflect that the environment of dental healthcare organizations needs to be improved to establish a more positive safety climate.

Patterns of SAQ-C scores that we observed were

generally higher than those of an earlier report in which the mean total scores for teamwork climate, safety climate, job satisfaction, perception of management, and working conditions were 57.95, 55.82, 66.20, 52.14, and 55.03 in public maternity units of Cyprus⁽²⁰⁾. Comparing our scores with Swedish community pharmacists, the dental healthcare workers rated higher only for the perception of management and rated lower for teamwork climate, safety climate, job satisfaction, and working conditions⁽²¹⁾.

The present findings, that the mean SAQ-C scores were significantly higher in workers who were male, an older age, dentists, and supervisors, were consistent with previously published studies. Gender is associated with differences in all domains of SAQ-C found in our study was also comparable to another study in which males performed better than females in teamwork climate, job satisfaction, perception of management, and working conditions^(28, 29). Similar to physicians who had more favorable perceptions of working conditions than nurses in intensive care units, dentists had more positive attitudes toward patient safety than dental assistants in dental healthcare organizations^(29, 30). On the contrary, in other studies, nurses generally had higher scores^(24, 28). In a Dutch pediatric surgical intensive care unit, nurses had higher scores for perceptions of management and working conditions than physicians⁽²⁸⁾.

Also, the present study suggests that dental healthcare workers aged 31e35 years and >35 years were more likely to have positive safety attitudes (OR, 2.43, 95% CI, 1.25-4.71; OR, 2.79, 95% CI, 1.64-4.75, respectively). This result is similar to the age-associated differences in perceptions of the patient safety climate found in maternity units of midwives aged >35 years old who produced a better safety climate than midwives aged <35 years⁽²⁰⁾. Our observation was that working for more than 10 years in a facility was associated with a positive safety attitude (OR, 2.39, 95% CI, 1.14-5.00) following a prior result. The more-experienced group of midwives was found to have higher scores in the teamwork and safety climate domains than less-experienced midwives⁽²⁰⁾.

The result emphasizes the need to improve the safety climate to enhance positive attitudes toward patient safety for less experienced dental healthcare workers. Our study provides important information on patient safety attitudes of dental healthcare workers. The results from the study can be used to understand the current status of patient safety culture in dental healthcare organizations and help raise dental healthcare workers' awareness of patient safety. Most notably, the study identified several

factors associated with positive attitudes toward patient safety among dental healthcare workers.

Conclusion:

the study provides important information on patient safety attitudes for dental healthcare workers. Also, provides the current status of patient safety culture and helps raise awareness of it. Most notably, the study identified several factors associated with positive attitudes toward patient safety. The information can be used to improve patient safety in the future.

Recommendation:

The information from the study can be used to guide interventions toward promoting improvements in patient safety. Furthermore, further study is needed to examine the association between the SAQ-C scores and patient outcomes in the dental field

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