ORIGINAL ARTICLE

Patient safety culture and identify factors associated with positive attitudes in private dental hospitals using the *Indonesian Safety Attitude Questionnaire* (SAQ-Indo): a cross-sectional study

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ABSTRACT

Introduction: Patient Safety culture (PSC) in healthcare represents a significant challenge on a global scale. However, in Indonesia data on the PSC among dental healthcare workers remain limited and knowledge about PSC among dental healthcare personnel is still insufficient. Consequently, there is a necessity for education and additional knowledge on this matter. This study aims to analyze the patient safety culture among dental healthcare workers and identify factors associated with positive attitudes in private dental hospitals using the *Indonesian Safety Attitude Questionnaire* (SAQ-Indo) **Methods**: A descriptive observational cross-sectional study design was used. The study was conducted among dental healthcare workers in two private dental hospitals in Jakarta and Semarang, Central Java. PSC factors were identified using bivariate analysis with Chi-square and simple logistic regression which classified responses as positive or negative based on the median of total score. The PSC score was the total score from 30 SAQ-Indo questions. **Results**: This study identified low, medium, good and very good safety culture levels based on percentile classification. Positive attitudes toward patient safety were found among participants from both private dental hospitals. Several factors were found to be associated with positive attitudes toward patient safety, including type of dental healthcare workers, age, level of education and practical experience. **Conclusion**: This study revealed patient safety attitudes among dental healthcare workers. The positive PSC scores were around 45% for the hospital in Jakarta and 32% for the hospital in Central Java. There is a need for socialization and education on PSC for dental healthcare workers at both private dental hospitals. Several factors were also found to be associated with positive attitudes toward patient safety, including professional role, age, educational level, and clinical experience. These findings may help increase awareness of patient safety at the hospital level in the future

KEYWORDS

Safety Culture, healthcare workers, private dental hospital, Indonesia

INTRODUCTION

Patient safety is an important matter of global concern, especially among healthcare workers, who are particularly focused on avoiding and preventing patient injuries that may occur during treatment.[1] This became a global topic of

conversation until the WHO launched the "*Global Alliance for Patient Safety*". Hippocrates's notes support this statement, namely *Primum, non nocere* (*First, do no harm*). As science and technology advance in health services, the risk of patient injury has increased. Several studies have illustrated that patient safety incidents are caused by elements of human resource behavior that can result in permanent damage.[2] and can also produce substantial financial consequences.[3,4]

The scientific background of this study highlights that patient safety for healthcare workers is very important, and to achieve patient safety, a culture of safety among healthcare workers is necessary so that zero accidents are achieved when providing services to patients. The main objective is to evaluate the PSC score and factors that contribute to a patient safety culture

Patient safety culture is fundamental for providing high quality dental care.[2,5] Healthcare workers and health institutions including oral health services are equally committed to providing the best care, in which one of the most important factors is safety. Some literature [2,6] states that errors can occur in dentistry as well .[2,7] According to Obadan, mechanisms for errors and treatment failures that can cause injury include fatigue, lack of experience, poor supervision, wrong procedures and low safety culture.[2] To prevent errors, a safety culture (SC) must be implemented. Improving patient safety culture in primary and secondary health facilities helps build public trust.[8,9]

In this era, to enhance the value of the patient safety culture perspective a collaborative approach is needed between primary and secondary services, to develop an integrated concept for improving patient safety conditions. In their research on patient safety culture in Taiwan, Cheng HC et al found that little information was available about patient safety culture and climate, especially regarding *'dental healthcare workers'* or medical personnel in the field of dental and oral health.[10]

From the description above, it is clear that patient safety culture factors are important for dental healthcare workers, However, patient safety culture is not measured in dental services, especially in dental hospitals. The focus of the study is on healthcare workers, including doctors, dentists and other healthcare workers supporting dental services at dental hospitals. Previous research on patient safety culture has primarily focused on secondary health services, specifically hospitals [10,11,12], but no research has been conducted on dental hospitals.

This is particularly true regarding Patient Safety Culture (SC) for healthcare workers, as reflected in the safety culture score, the perception of SC for each healthcare worker, contributing factors and the relationship between dentist and non-dentist regarding PSC. Therefore, it is necessary to conduct research on patient safety culture among healthcare workers at dental hospitals.

The analysis was was carried out using a measurement instrument capable of evaluating the respondents' perceptions by integrating components from diverse domains of patient safety culture, namely the Safety Attitude Questionnaire (SAQ).[13,14–16] The SAQ was initially developed by Sexton et al more than two decades ago at the University of Texas, United States [16] and subsequent modifications have been implemented by researchers from various global regions.[10,14,15,17–20] The safety of patients is of utmost importance in healthcare systems around the world. The primary goal is to prevent avoidable mistakes and harmful incidents that could negatively impact patients when they interact with healthcare providers.[21]

The benefit of this study is to determine the value of patient safety culture among healthcare workers in hospitals. If healthcare workers in these hospitals have a positive PSC score, they are expected to perform their duties in serving patients optimally according to standards, avoid mistakes, and prevent incidents/malpractice.

The questionnaire was adapted from the original SAQ – short version, which consists of 30 items and six dimensions of safety culture.[15,16,22,23] The SAQ was chosen because it is among nine measuring tools that are considered suitable for

evaluating safety culture in healthcare organizations. It offers the potential for implementation on a large scale, and is suitable for quantitative research.[11,21]

The SAQ has also been utilized in research conducted in primary and secondary healthcare facilities. An Indonesian version of the SAQ has been validated and found to be reliable. This version has been tested on dentists throughout Indonesia and is considered to be a suitable measurement instrument for other health professionals so that it can be used for measuring instruments for other healthcare workers.[24]

At this juncture the Dental Hospital in Jakarta and Semarang has been selected for analysis due to its equivalent to a private Dental Teaching Hospital. Presently, researchers seek to gain a comprehensive understanding of the Dental Teaching Hospital landscape in DKI Jakarta and Semarang, Central Java. In addition to the PSC score, the contributing factors will be discussed in detail Furthermore a comparison of the PSC score for healthcare workers in the two Dental Teaching Hospitals will be conducted.

The findings of the research constitute a novel contribution to the field of dentistry with the objective of yielding an overview, perception, comparison and factors that are valuable to patient safety culture in secondary services. The research respondents were healthcare workers at Dental Teaching Hospital, and the study also examined factors that contribute to safety culture for these healthcare workers.

The novelty of this study is that it examines the safety culture among healthcare workers in private hospitals, particularly private dental and oral hospitals in DKI Jakarta and Central Java, where the positive value of the safety culture is sought to be determined and compared with previous studies conducted in primary healthcare facilities.[24]

This analysis can be used as foundational information to promote change, enhance attitudes and modify behaviours. It can also be used to develop intervention strategies that improve patient safety culture programs in dental services throughout Indonesia. The dissemination of this information is expected to facilitate the effectiveness and efficiency of health service management at secondary health facilities in implementing the patient safety program.

This program needs to be meticulously planned to enhance patient safety culture and systematically evaluated to assess the progress and impact of the Patient Safety program. This study aims to analyze the patient safety culture among dental healthcare workers and identify factors associated with positive attitudes in private dental hospitals using the *Indonesian Safety Attitude Questionnaire* (SAQ-Indo).

METHODS

This research was a descriptive observational study using a cross-sectional study design. The study was conducted at two private dental hospitals in Jakarta and Central Java in February 2024. The population consisted of 200 healthcare workers from two private dental hospitals. The selected sample was obtained through total sampling, meaning that every healthcare worker in both private dental hospitals was included as a respondent.

Participants were healthcare workers consisting of medical personnel (doctors, nurses, dental therapists, laboratory technicians, radiographers, pharmacists) and non-medical personnel (administrators, management, admission officers, occupational health and safety officers, and environmental health officers). The sample criteria included employees at the two hospitals. The selected sample was determined using total sampling so that all employees at both hospitals were included in the study.

This research used a total sampling technique, which included the entire population of healthcare workers in both hospitals.[25] The dependent variable was

Patient Safety Culture and the independent variables were respondent type, age, gender, hospital department, education, number of patients served per day, practical experience, and whether or not the respondent has participated in patient safety training

The survey utilized the *SAQ-Indo questionnaire*, The data were obtained through Google Forms using a standardized questionnaire instrument. SAQ Indo is a modification of the SAQ Texas and Chinese versions, It comprises 30 items which collectively reflect six dimensions of PSC [11,16,14] The following factors were examined: Safety Climate, Teamwork climate, Job Satisfaction, Stress Recognition, Perception of Management and Working Condition.

The SAQ-Indo instrument has been tested for validity and reliability among Indonesians, and the research has been published by Juliawati.[24] This research fully adopted using the SAQ- Indo questionnaire the following is an excerpt from the validity and reliability test results. The reliability assessment demonstrated a total Cronbach α for the 30 items of 0.897, and the total Cronbach α for 6 domains was 0.727. The results illustrate that the internal consistency category was acceptable ($0.7 \leq \alpha \leq 0.8$), good ($0.8 \alpha \leq 0.9$), and excellent/very good ($\alpha \geq 0.9$). These conditions suggest that the questionnaire is reliable.

The construct validity test results revealed that most item variables had moderate to strong correlation (r=0.422–0.699). This finding is consistent with previous studies.[14,23] Overall analysis results suggest that questionnaire items, dimension, and total score were appropriate and valid for the Indonesian version of the SAQ.[24]

The score of Safety Culture (SC) was calculated through conversion and categorization [10,11,14]. Where the 30 items of the SAQ questionnaire were added up and converted according to the Likert scale to a scale of 0-100. After that, classification was performed out into quartiles. Scores were calculated by adding up 30 items. The scores were then categorized into quartiles according to the following criteria: <25% poor tiles, 25%-49% moderate tiles, 50%-74% are good, and ≥75% are excellent. The negative SC score was defined as less than the 50 percent tile, while positive SC scores included good and excellent categories.

A positive safety culture is an organizational climate in which all healthcare workers from leaders to staff consistently prioritize patient and worker safety. This climate is characterized by shared values and norms about safety, an environment in which people feel comfortable speaking up, a commitment to learning from mistakes (including near-misses), and confidence in the effectiveness of preventive systems. It is widely acknowledged that institutions with a positive patient safety culture tend to provide safer care to their patients.[26]

The study described demographic information that was hypothesized to affect positive attitudes toward patient safety. The sample was composed of respondents from the Dental Teaching Hospital in Jakarta and Semarang Central Java and in reporting We use initials. The study relied on the total population, so no sample calculation formula was required.

The method of data processing in this study included several stages. First, data from Google Forms were downloaded in Excel format, then cleaning, coding, and analysis were performed. The analysis included descriptive statistics, presenting the number and percentage of each variable. For PSC, categorization followed quartile analysis.

The PSC factors were identified using Bivariate analysis with Chi-square and simple logistic regression. P value was generated and less than 0,05 was considered statistically significant. The odds ratio and its 95% confidence interval were obtained from Simple logistic regression analysis. The Statistic Analysis used the SPSS 23 version and Microsoft Excel.

A possible bias in this study is the honesty of respondents. To anticipate this, the researchers explained how to fill out the questionnaire and the purpose of the study before the study began.

RESULTS

The characteristics of respondents will be explained in the following paragraph. Dental healthcare workers from two private dental hospitals completed the questionnaire distributed through Google Forms, resulting in 200 valid responses out of 261 invitations, yielding an overall response rate of 76.6 %. The respondent characteristics included professional role (medical or non-medical staff), age group (<37 years and ≥37 years), gender, department (medical services, medical support, management, others), education level (SMA, D3, S1, S2, S3, Specialist), number of patients treated per day (1–10, 11–20, >20, or none), practical experience (1–5 years, 11–15 years, >20 years), and participation in patient safety seminars or training.

In both private dental hospitals, most respondents were medical staff (n=109). The dominant age category was ≥37 years (n=102). Female respondents were more numerous (n=122). The majority of respondents held a D3 degree. The majority of respondents came from the medical services department (n=120). Most respondents held a D3 education. Most clinicians treated 1-10 patients per day and many had more than 20 years of practical experience (27 out of 74 dentists and 91 non-medical people so they do not practice) The majority of respondents have attended seminars or training on patient safety (n=124) (Table 1).

Table 1. Comparison of demographic characteristics of respondents between two private dental hospital setting (N = 200)

Variable	Category	Private Dental Hospital 1 (n=143)		Private Dental Hospital 2 (n=57)		Total
		n	%	n	%	
Respondent Type	Medical	85	77.98	24	22.02	109
	Non Medical	58	63.74	33	36.26	91
Age group	<37 years	58	59.18	40	40.82	98
	≥ 37 years	85	83.33	17	16.67	102
Gender	Male	53	67.95	25	32.05	78
	Female	90	73.77	32	26.23	122
Department	Management	18	54.55	15	45.45	33
	Others	11	78.57	3	21.43	14
	Medical Services	92	76.67	28	23.33	120
	Medical Support	22	66.67	11	33.33	33
Education	D3	30	68.18	14	31.82	44
	S1	19	55.88	15	44.12	34
	S2	28	82.35	6	17.65	34
	S3	24	82.76	5	17.24	29
	SMA	13	72.22	5	27.78	18
	Specialist	29	70.73	12	29.27	41
Number of px serviced p day	1-10	58	63.74	33	36.26	91
	11 - 20	73	76.84	22	23.16	95
	> 20	4	80.00	1	20.00	5
	0	8	88.89	1	11.11	9
practical experience		58	63.74	33	36.26	91
	> 20 years	26	96.30	1	3.70	27
	1- 5 years	12	57.14	9	42.86	21
	11 - 15 years	19	73.08	7	26.92	26
Ever been attending a px safety seminar	Yes	86	69.35	38	30.65	124
	No	57	75.00	19	25.00	76

Table 2 demonstrates that Hospital Y had 31.58% Positive PSC Score and 68.42% Negative PSC Score, whereas Hospital X 44.76% Positive PSC Score and 55.25 % negative PSC Score.

Table 2. Patient Safety Culture Score based on Dental Hospital (n=200)

Respondent	Patient Safety Culture Score					
	Negative			Positive		
	Low	Medium	%	Good	Excellent	%
Hospital X	32.87	22.38	55.24	27.97	16.78	44.76
Hospital Y	35.09	33.33	68.42	21.05	10.53	31.58

Notes : X – Jakarta. Y – Central Java

Characteristics of Dental Hospital's Respondent Variables are described in the following table captions. Table 3 describes the differences in the characteristics of those dental hospitals. The characteristics are said to be the same if the p value is not significant ($p \geq 0.05$). while other characteristics are significant if $p < 0.05$. Three variables differed significantly: type of employee, age, and practical experience.

This table indicates that the distribution of medical and non-medical staff, as well as the distribution of age groups and years of practice, differed between Hospital X and Hospital Y. The practical experience is also significantly different between the two hospitals. Other variables are not significant (gender. department. education. number of patients worked per day. and having attended training/seminars on SC).

Table 3 therefore concludes that professional role, age, and practical experience differ between Hospital X and Y.

Table 3 Characteristics of Respondent Variables (n=200)

Variable	Catagory	Dental Hospital X (n=143)		Dental Hospital Y (n=57)		Total Amount	P value
		n	%	n	%		
Type of employee	Medical	85	77.98	24	22.02	109	0.026*
	Non Medical	58	63.74	33	36.26	91	
Age	<37 year	58	59.18	40	40.82	98	0.000*
	≥37 year	85	83.33	17	16.67	102	
Gender	Male	53	67.95	25	32.05	78	0.374
	Female	90	73.77	32	26.23	122	
Department	Administration / Management	18	54.55	15	45.45	33	0.074
	Others	11	78.57	3	21.43	14	
	Medical Services	92	76.67	28	23.33	120	
	Medical Support	22	66.67	11	33.33	33	
Education	D3	30	68.18	14	31.82	44	0.151
	S1	19	55.88	15	44.12	34	
	S2	28	82.35	6	17.65	34	
	S3	24	82.76	5	17.24	29	
	SMA	13	72.22	5	27.78	18	
	Specialist	29	70.73	12	29.27	41	
Number of patients treated per day		58	63.74	33	36.26	91	0.137
	1-10	73	76.84	22	23.16	95	
	11-20	4	80.00	1	20.00	5	
	none	8	88.89	1	11.11	9	
Practical Experience		58	63.74	33	36.26	91	0.005*
	> 20 year	26	96.30	1	3.70	27	
	1- 5 year	12	57.14	9	42.86	21	
	11 - 15 year	19	73.08	7	26.92	26	
Have attended seminars/training on Patient Safety Culture	Ever	86	69.35	38	30.65	124	0.391
	Never	57	75.00	19	25.00	76	

*p<0.05

Factors associated with Positive Safety Culture are presented in Table 4. Four variables showed significant associations with Positive Safety Culture (p value <0.05): professional role, age, education level and practical experience. Medical

healthcare workers were 3.17 times more likely to have a positive Safety Culture (95% CI 1.74 - 5.78) than non-medical workers.

Age was also associated with Safety Culture. Respondents aged ≥37 years were 2.36 times more likely to have a positive Safety Culture (95% CI 1.32 to 4.21) compared with younger respondents. Education level showed a strong association, where respondents with a Bachelor's degree or higher were 3.33 times more likely to have positive Safety Culture (95% CI 1.68 - 6.59).

Practical Experience also influenced PSC scores: individuals with more than 10 years of practice had 3.75 times higher probability of positive Safety Culture (95% CI 2.00 – 7.02) than those with fewer years of practice. Other variables, including gender and participation in patient safety seminars or training, were not associated with Positive Safety Culture.

Table 4. Factors Associated with a Positive Safety Culture in Hospitals X and Y (n=200)

Variable	Catagory	Negative Safety Culture (n=118)		Positive Safety Culture (n=82)		Total	P value	OR	95% CI	
		n	%	n	%				Lower	Upper
Sample type (Employee)	Non Medical	67	73.63	24	26.37	91	0.000*	1.00		
	Medical	51	46.79	58	53.21	109		3.17	1.74	5.78
Age	<37 years	68	69.39	30	30.61	98	0.003*	1.00		
	≥ 37 years	50	49.02	52	50.98	102		2.36	1.32	4.21
Gender	Wanita	68	55.74	54	44.26	122		1.00		
	Pria	50	64.10	28	35.90	78	0.241	0.71	0.39	1.27
Last Education	< Bachelor	48	77.42	14	22.58	62	0.000*	1.00		
	≥ Bachelor	70	50.72	68	49.28	138		3.33	1.68	6.59
Practical Experience	≤10 years	95	68.84	43	31.16	138	0.000*	1.00		
	>10 years	23	37.10	39	62.90	62		3.75	2.00	7.02
Have attended seminars/training on Patient Safety Culture	Never	43	56.58	33	43.42	76	0.586	1.00		
	Ever	75	60.48	49	39.52	124		0.85	0.48	1.52

*p<0.05; ** bivariat analysis using Chi square and simple logistic regression

DISCUSSION

The objective of this study was to examine the significance of patient safety culture in healthcare workers employed in secondary health facilities, particularly in designated dental teaching hospitals. Two private dental teaching hospitals located in Jakarta and Semarang were selected because of their comparable organizational structure and service characteristics. Researchers at this preliminary stage sought to gain a comprehensive understanding of patient safety culture within these facilities. In addition to the Safety Culture Score, the following topics will be elaborated upon: the contributing factors and the comparison of the SC Score between the two dental hospitals.

Patient safety constitutes an essential component of healthcare quality. As healthcare organizations endeavor to enhance their performance, the significance of cultivating a safety culture has become increasingly recognized.[27] The results of the study offer a meaningful contribution to dental healthcare research by providing an overview, perceptions, comparisons and factors associated with safety culture in secondary dental care settings. The research respondents were

healthcare workers at the Dental Teaching Hospitals, and the study also examined factors that contribute to their safety culture.

In accordance with the objective of knowing the SC score of healthcare workers in private Dental Hospitals, the results from the two hospitals show a modest difference in Positive Safety Culture scores (table 2), with Hospital X (Jakarta) demonstrating the higher percentage. In this study, the Positive Safety Culture score is around 45%, which remained lower than the combined proportion of moderate and low scores. This differs from findings in China and Taiwan, where Positive Safety Culture scores ranged from 51 to 55.7%, even though respondents were similar in terms of profession and the setting was also secondary healthcare facilities.[10,28,29]

Table 3 concludes that the type of employee, age, and practical experience differed between Hospital X and Y. Gender, department, education, number of patients treated per day, and participation in SC related training/seminars were not significantly different. According to research on dentists in Indonesia The results of Positive Safety Culture Score is higher, namely 51.6%, this is because in healthcare worker respondents the types of human resources are more diverse than research only on dentists.[27-30]

In the characteristics of the respondents, it was found that the two hospitals have different characteristics in terms of the type of human resources, age and the experience of practice (Table 1). Medical personnel were more numerous than non-medical personnel in both hospitals.

Age distribution also differed, with respondents aged ≥37 years being more dominant than younger ones. This finding aligns with Cheng HC (2019) in a study at a Taiwanese hospital, where the age factor in the Taiwanese study showed that dental healthcare workers and midwives in the maternity unit of the hospital aged over 35 years demonstrated a better positive safety attitude (OR, 2.43, 95%, 1.25–4.71).[10] This is consistent with the present study (table 3), which shows that respondents aged 37 years or older had a 2.36 times higher probability of demonstrating a Positive Safety Culture (95% CI 1.32 - 4.21) than younger respondents. Similarly, practical experience also showed significant influence, especially among respondents with more than 20 years of experience. (Table 4)

Factors related to Positive SC in this study included four factors related to Positive SC: professional role, age, education level and practical experience (Table 4). This differs somewhat from Juliawati et al's research on dentists, who reported gender, education, location of practice, practical experience and participation in patient safety training as significant predictors among dentists.

Age was significantly correlated with Positive Safety Culture, consistent with several studies in Taiwan[10] and several other studies in China [12,29] For Education Level, there is a significant relationship between education level and Patient Safety Culture Scores, and these results are in line with the Safety culture research conducted in Harbin, North China.[12] Medical personnel with more than 10 years of practice have a probability of Positive Safety Culture 3.75 times higher (95% CI 2.00 – 7.02) compared to those with less than 10 years of practice. This is in line with research by Juliawat and Taiwan.[30,10]

Practical experience showed a significant association with Positive Values of Patient Safety Culture (p=0.014), particularly among those with more than 20 years (OR 1.56), this is in line with research in Taiwan.[10] This present study similarly found that Practical Experience is related to positive SC (table 3). A medical healthcare worker with more than 10 years of practice has a probability of Positive Safety Culture 3.75 times higher (95% CI 2.00 – 7.02) than a person with less than 10 years of practice.

Research in Taiwan has demonstrated that healthcare workers with more than 10 years of experience were associated with a positive safety attitude (OR 2.39, 95% CI, 1.14-5.00) in accordance with a prior report. The more-experienced group of midwives was found to have higher scores in the teamwork and safety climate domains than less-experienced midwives.[10] The result emphasizes the

need to improve the safety climate to enhance positive attitudes toward patient safety for less- experienced dental healthcare workers.

There is a tendency in larger samples to show a higher likelihood of producing significantly contributing factors that correlate with Patient Safety Culture.[30] There are other factors that we did not examine that turned out to be significant in other studies, such as job position, collaboration with other staff, which could be explored in future research.

The limitation of this research is that only two private hospitals were included, as this research is in its preliminary phase. Consequently, it is not yet possible to provide a comprehensive overview of the SC score outcomes for private hospitals in general. Further research involving additional hospitals and larger respondent samples is necessary to obtain a more comprehensive understanding of Safety Culture in private dental healthcare settings. This will allow for the attainment of SC score results on a broader scale.

CONCLUSION

This study identified patient safety attitudes among dental healthcare workers. The Positive PSC scores are around 45% for the hospital in Jakarta and 32% for the hospital in Central Java. There is a need for increased socialization and education regarding PSC for dental healthcare workers in both private dental hospitals. Several factors were found to be associated with positive attitudes toward patient safety: professional role, age, education level, and practical experience. These findings may enhance awareness of patient safety at the hospital level in the future

The implication of these findings suggests that hospital administrators and policymakers should prioritize the development of targeted interventions and capacity-building programs to strengthen patient safety culture, particularly in private dental healthcare settings. Enhancing awareness and promoting a culture of safety at the institutional level are essential steps toward improving overall healthcare quality and minimizing the risk of adverse events in dental practice.

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