

Predictors of patient safety culture assessment in a public hospital in Poland

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Abstract

Introduction: Patient safety is crucial for healthcare quality and patient trust. It involves activities, attitudes, and procedures to minimise medical errors and provide high standards of care.

Aim of the research: The aim of the study was to assess patient safety culture from the perspective of medical staff in a hospital, taking into account professional group affiliation and length of service.

Material and methods: The research group included $N = 78$ medical staff members (80% nurses and midwives, 20% doctors). The Polish adaptation of the Hospital Survey on Patient Safety Culture (HSOPSC) was used.

Results: Overall patient safety, measured as the average percentage of positive responses across 12 dimensions, was 36.8%. The best-assessed area was “Teamwork within units”, while the lowest was “Hospital management support for patient safety”. Differences were found between nurses/midwives and doctors: physicians rated “Staffing” more positively and reported more adverse events ($\chi^2 = 11.16$, $df = 2$, $p = 0.004$). Employees with higher length of service (> 10 vs. ≤ 10 years) rated “Organizational learning – continuous improvement” higher ($p = 0.03$). However, length of service was not statistically associated with adverse event reporting frequency ($p = 0.71$). Employees who believed their mistakes would be used against them assessed overall patient safety more negatively ($p < 0.001$).

Conclusions: The study’s findings can help identify areas for improvement in patient safety culture, enabling targeted solutions to reduce adverse events and improve error reporting processes.

Introduction

Patient safety is one of the most important aspects of healthcare; it is crucial to the quality of medical services provided and patient trust in the healthcare system. Rapidly developing medicine and high public expectations have made patient safety culture a priority for both medical institutions and health care professionals [1]. According to meta-analysis, the estimated incidence of preventable patient harm was 6%, and 12% of preventable patient harm was serious or fatal [2]. Identifying causes and developing strategies to minimise medical errors is essential to improving healthcare quality.

In 2004, the US Agency for Healthcare Research and Quality (AHRQ) created a patient safety culture questionnaire for hospitals and medical facilities (Surveys on Patient Safety Culture – SOPS). In 2019, a modernised version of the SOPS 2.0 survey was developed [3]. The survey has been used in hundreds of hospitals in the US and, by 2022, in 99 countries [4, 5]. The questionnaire includes 12 dimensions to assess patient safety strengths and weaknesses.

Systematic reviews of studies using SOPS have shown that the highest scores were obtained for the di-

mension “Teamwork within units”. The lowest scores were given to “Response to error” and “Staffing” [6, 7]. The assessment of safety culture may vary by professional position; however, the results are inconsistent [8].

Aim of the research

We decided to assess the patient safety culture from the point of view of medical staff in one of the hospitals in the Małopolska Voivodeship in Poland and to verify whether this assessment was influenced by the professional position (doctor/nurse), the length of service of the staff, and the staff’s belief that the mistakes made could be used against them.

Material and methods

The research group consisted of medical personnel who work directly with patients. Data were collected from January to May 2024 using the Polish adaptation of the Hospital Survey on Patient Safety Culture (HSOPSC) questionnaire [9, 10]. Questionnaires were distributed in all hospital departments, except the Emergency Department, where a total of 580 medical staff members were employed. Out of 200 dis-

Table 1. Detailed characteristics of the study group

Question		<i>n</i>	%
How long have you been working at the hospital where you were given the survey?	Less than a year	7	9.0
	1–3 years	17	21.8
	4–6 years	13	16.7
	7–10 years	5	6.4
	11–15 years	5	6.4
	16–20 years	8	10.3
	21 years or more	23	29.5
On average, how many hours per week do you work at this hospital?	Less than 20 hours per week	3	3.8
	20 to 39 hours per week	51	65.4
	40 to 59 hours per week	19	24.4
	60 to 79 hours per week	5	6.4
What is your professional position?	Doctor	15	19.2
	Nurse/Midwife	63	80.8
How long have you been working in your current job?	Less than a year	5	6.4
	1–3 years	10	12.8
	4–6 years	12	15.4
	7–10 years	9	11.5
	11–15 years	6	7.7
	16–20 years	11	14.1
	21 years or more	25	32.1

tributed paper questionnaires, 86 were returned, but only 78 were included in the study (42% return rate, 39% for analysed sheets) due to incomplete responses (< 10% completion). Of the returned questionnaires, 63 (80%) were completed by nurses and midwives, and 15 (20%) by physicians.

The questionnaire included 12 dimensions with 42 statements, answered on a 5-point Likert scale. Dimensions 5 and 8 were outcome-related, while the other 10 were process-related. Two outcome questions focused on overall perceptions of patient safety and the number of reported adverse events in the last year. For negatively worded statements, the scoring was reversed and marked with “R”.

Participants voluntarily completed the survey and, by providing answers, consented to participate in the study. The study adhered to the principles of the Declaration of Helsinki.

Statistical analysis

Participants were divided into two groups based on length of service: less than 10 years ($n = 42$, 53.8%) and more than 10 years ($n = 36$, 46.2%). Differences in the assessment of patient safety between professional groups (doctors vs. nurses/midwives) and length of ser-

vice groups were analysed using the Mann-Whitney U test and the Student t -test when appropriate. Differences in adverse event reporting across professions and length of service groups were tested using the Pearson χ^2 test. The correlation between the (A8R) and the overall assessment of patient safety (W5) was analysed using the Spearman rank correlation and the Mann-Whitney U test. According to the adopted methodology [11–14], dimensions with 75% or more positive responses were considered strong, 50% to 75% – neutral, and < 50% – required improvement. Data were analysed using Statistica version 13.3, with statistical significance set at 0.05.

Results

The characteristics of the study participants are presented in Table 1.

Patient safety in the hospital

The highest percentage of positive answers was 68.59% in W1 (“Teamwork on the ward”), and the lowest was 13.42% in W4 (“Support of the management for patient safety”). Breaking it down, the highest percentage of positive answers was for statement A1 – 89.7% (“people help each other in my workplace”), while the lowest was for F1 – 9.1% (“hospital manage-

Table 2. Descriptive statistics for the 12 dimensions and 42 items included in the HSOPSC questionnaire

	Dimension statistics					Statistics of individual items						
	M	Me	SD	Positive [%]	Negative [%]		Positive [%]	Neutral [%]	Negative [%]	M	Me	SD
W1	3.56	3.5	0.78	68.59	20.2	A1	89.7	1.3	9.0	4.10	4	0.95
						A3	75	13.2	11.8	3.87	4	1.04
						A4	60.3	23.1	16.7	3.50	4	0.98
						A11	48.6	6.8	44.6	3.03	3	1.22
W2	3.15	3.25	0.79	44.16	30.2	B1	36.4	28.6	35.1	2.99	3	1.09
						B2	48.1	24.7	27.3	3.22	3	1.11
						B3R	37.7	28.6	33.8	3.06	3	0.98
						B4R	54.5	20.8	24.7	3.31	4	1.03
W3	3.18	3.33	0.75	42.31	23.1	A6	61.5	30.8	7.7	3.59	4	0.86
						A9	35.1	37.7	27.3	3.05	3	1.01
						A13	29.5	35.9	34.6	2.87	3	1.01
W4	2.44	2.33	0.76	13.42	56.7	F1	9.1	29.9	61.0	2.35	2	0.91
						F8	16.9	33.8	49.4	2.55	3	1.01
						F9R	14.3	26.0	59.7	2.42	2	0.98
W5	2.99	3	0.66	39.21	36.3	A10R	55.8	24.7	19.5	3.42	4	1.03
						A15	19.5	20.8	59.7	2.45	2	1.08
						A17R	47.4	21.8	30.8	3.17	3	1.04
						A18	33.8	31.2	35.1	2.92	3	1.06
W6	3.29	3.3	0.84	45.45	26.8	C1	39.5	28.9	31.6	3.22	3	1.09
						C3	58.4	23.4	18.2	3.57	4	0.98
						C5	37.7	31.2	31.2	3.08	3	1.02
W7	2.95	3	0.75	33.77	36.8	C2	44.2	31.2	24.7	3.34	3	1.01
						C4	20.8	22.1	57.1	2.43	2	1.08
						C6R	36.4	35.1	28.6	3.08	3	0.94
W8	3.00	3	0.94	30.30	37.7	D1	25.3	29.3	45.3	2.79	3	1.06
						D2	23.4	35.1	41.6	2.86	3	1.07
						D3	40.8	32.9	26.3	3.33	3	1.10
W9	2.79	2.75	0.64	26.60	42.9	F2R	16.9	23.4	59.7	2.48	2	0.97
						F4	48.1	29.9	22.1	3.27	3	0.95
						F6R	15.6	24.7	59.7	2.49	2	0.93
						F10	26.9	41.0	32.1	2.91	3	0.89
W10	2.97	3	0.60	38.46	40.4	A2	25.6	1.3	73.1	2.31	2	1.15
						A5R	46.2	39.7	14.1	3.38	3	0.98
						A7R	62.3	28.6	9.1	3.82	4	1.00
						A14R	19.2	15.4	65.4	2.38	2	0.97
W11	3.03	3	0.77	38.57	39.0	F3R	18.4	23.7	57.9	2.58	2	1.00
						F5R	48.1	15.6	36.4	3.19	3	1.27
						F7R	16.9	27.3	55.8	2.56	2	0.97
						F11R	67.9	24.4	7.7	3.73	4	0.92
W12	2.69	2.67	0.65	20.51	49.6	A8R	15.4	21.8	62.8	2.49	2	0.89
						A12R	24.4	17.9	57.7	2.67	2	1.02
						A16R	21.8	50	28.2	2.92	3	0.83

R – statement about negative verbal construction, the score was reversed.

Table 3. Differences in the responses to all dimensions according to professional group (nurses/midwives vs. doctors)

Dimension	Group	Me (Q1-Q3)	Mean (SD)	Mann-Whitney <i>U</i> test		Student's <i>t</i> test	
				<i>Z</i>	<i>P</i> -value	<i>t</i> (df)	<i>P</i> -value
W1	Doctors	3.5 (3.25–4)	3.6 (0.68)	0.24	0.81		
	Nurses/midwives	3.8 (3.25–4)	3.6 (0.81)				
W2	Doctors	3.3 (2.75–4)	3.4 (0.79)			–1.20 (75)	0.23
	Nurses/midwives	3 (2.5–3.75)	3.1 (0.79)				
W3	Doctors	3.3 (3–3.7)	3.2 (0.69)	–0.35	0.73		
	Nurses/midwives	3.3 (2.7–3.7)	3.2 (0.77)				
W4	Doctors	2.8 (2–3)	2.6 (0.82)	–0.79	0.43		
	Nurses/midwives	2.3 (1.7–3)	2.4 (0.75)				
W5	Doctors	3.25 (2.8–3.5)	3.2 (0.51)			–1.16(76)	0.25
	Nurses/midwives	3 (2.5–3.5)	2.9 (0.69)				
W6	Doctors	3.3 (3–4)	3.6 (0.70)	–1.61	0.11		
	Nurses/midwives	3.3 (2.3–4)	3.2 (0.89)				
W7	Doctors	3.3 (2.3–4)	3.2 (0.76)	–1.41	0.16		
	Nurses/midwives	2.7 (2.3–3.7)	2.9 (0.75)				
W8	Doctors	3 (2.7–4)	3.2 (0.79)	–1.27	0.21		
	Nurses/midwives	2.7 (2–3.7)	3 (0.97)				
W9	Doctors	2.8 (2–3.5)	2.9 (0.69)			–0.39 (76)	0.70
	Nurses/midwives	2.8 (2.5–3.3)	2.8 (0.64)				
W10	Doctors	3.3 (3–3.8)	3.3 (0.53)			–2.27 (76)	0.03
	Nurses/midwives	3 (2.5–3.3)	2.9 (0.60)				
W11	Doctors	3 (2.3–3.8)	3.1 (0.95)	0.29	0.77		
	Nurses/midwives	3 (2.5–3.5)	3 (0.73)				
W12	Doctors	2.7 (2.3–3.3)	2.8 (0.70)	–0.68	0.50		
	Nurses/midwives	2.7 (2.3–3)	2.7 (0.65)				

ment creates an atmosphere that promotes patient safety”). Detailed data for each dimension and item are presented in Table 2 and Supplementary Table S1.

In the last 12 months, only 10.25% ($n = 8$) of respondents reported at least one adverse event. Additionally, 11.54% ($n = 9$) wanted to report an event but could not do so anonymously, while 71.21% ($n = 61$) did not report any event. Regarding patient safety ratings in their work areas, 88.33% rated the level as very good or acceptable. Notably, no respondents rated overall safety as very poor, and only 10.26% ($n = 8$) rated it as poor.

Type of profession and patient safety culture

A statistically significant difference in the assessment of W10 (“Staffing”) between nurses/midwives and doctors was found ($p = 0.03$). Physicians rated the items in W10 (A2, A5R, A7R, A14R) significantly better than nurses and midwives. In the remaining

dimensions, there were no statistically significant differences between these two professions (Table 3).

Professional group affiliation was associated with reporting adverse events ($\chi^2 = 11.16$, $df = 2$, $p = 0.004$). As many as 84% of nurses/midwives did not report a single adverse event in the past 12 months, while less than 5% reported at least one. In the group of doctors, 53% did not report any events, and 33% reported at least one in the past year. A larger percentage of doctors selected the option “I wanted to report, but it is not possible anonymously” than nurses (13.3% vs. 11.1%, respectively).

Length of service and patient safety culture

A statistically significant difference in the assessment of patient safety culture between the length of service groups was found only in W3 (“Organisational learning – continuous improvement”) ($p = 0.03$). Employees with

Table 4. Differences in the responses to all dimensions according to the length of service in the hospital

Dimension	Length of service in the hospital	Me (Q1-Q3)	Mean (SD)	Mann Whitney U test		Students t test	
				Z	P-value	t (df)	P-value
W1	< 10 years	3.5 (3–4)	3.4 (0.89)	-1.36	0.18		
	> 10 years	3.6 (3.5–4.1)	3.7 (0.64)				
W2	< 10 years	3.3 (2.8–4)	3.2 (0.86)			1.01 (75)	0.31
	> 10 years	3.3 (2.5–3.6)	3 (0.71)				
W3	< 10 years	3 (2.7–3.3)	3 (0.76)	-2.16	0.03		
	> 10 years	3.7 (3–3.7)	3.3 (0.73)				
W4	< 10 years	2.7 (2–3)	2.5 (0.64)	0.35	0.73		
	> 10 years	2.3 (1.7–3)	2.4 (0.89)				
W5	< 10 years	3 (2.5–3.5)	3 (0.60)			-0.10 (76)	0.92
	> 10 years	3.1 (2.5–3.6)	3 (0.73)				
W6	< 10 years	3.3 (2.7–4)	3.3 (0.79)	-0.43	0.67		
	> 10 years	3.3 (2.3–4)	3.3 (0.92)				
W7	< 10 years	3 (2.3–3.3)	2.9 (0.75)	-0.10	0.92		
	> 10 years	2.8 (2.3–3.7)	3 (0.76)				
W8	< 10 years	3 (2–3.3)	2.9 (0.99)	-0.85	0.40		
	> 10 years	3 (2.7–3.8)	3.1 (0.89)				
W9	< 10 years	2.9 (2.5–3.3)	2.9 (0.66)			0.88 (76)	0.38
	> 10 years	2.8 (2.5–3.1)	2.7 (0.63)				
W10	< 10 years	3 (2.5–3.3)	3 (0.52)			-0.16 (76)	0.87
	> 10 years	3 (2.5–3.5)	3 (0.69)				
W11	< 10 years	3 (2.5–3.5)	3.1 (0.78)	0.60	0.55		
	> 10 years	3 (2.4–3.5)	2.9 (0.76)				
W12	< 10 years	2.7 (2.3–3.3)	2.8 (0.72)	0.97	0.33		
	> 10 years	2.7 (2.3–2.7)	2.6 (0.56)				

> 10 years of service rated items in this dimension (A6, A9, A13) higher than those with < 10 years of service. In other dimensions, there was no statistically significant difference between the groups (Table 4).

The relationship between length of service and reporting adverse events in the last 12 months was not statistically insignificant (Pearson's $\chi^2 = 0.69$, $df = 2$, $p = 0.709$).

Fear of the consequences of making mistakes and patient safety

Positive correlation was found between fear of the consequences of making mistakes and assessment of patient safety ($R = 0.42$, $p = 0.0002$). The same relationship was confirmed by the Mann-Whitney U test, which showed that people who were convinced that their mistakes were or would be used against them assessed overall patient safety more negatively

than people who did not have such a belief (corrected $Z = -3.58$; $p = 0.0004$).

Discussion

The overall patient safety score was 36.78%, indicating a low level of safety culture needing improvement, because it falls below the 50% threshold defined in previous studies [12–14]. Comparison with studies from other Polish centres (Warsaw hospitals) [10] is shown in Supplementary Table S2.

The best-assessed dimension across studies [6–8] was W1 “Teamwork within units”. Both in our study and in the study in Poland [10], despite being the best-assessed dimension, the percentage of positive answers did not exceed 75% (68.59% and 66.2%, respectively), indicating it was a neutral aspect of patient safety.

In our study, “Organisational learning – continuous improvement” (W3) emerged as a key aspect il-

lustrating the involvement of hospital employees in enhancing patient safety culture and implementing changes. More than half (61.5%) of respondents declared active work to improve patient safety, while only 35.1% agreed with “Mistakes have led to positive changes here” (similarly in the Warsaw hospitals [10]). To be effective, changes must be continually verified and adjusted, but only 29.5% positively responded to “After we made changes to improve patient safety, we evaluate their effectiveness” (54.2% in Warsaw hospitals [10]). This raises questions about the limited introduction of changes and their effectiveness. The solution may involve organisational learning at the system level, with new rules or procedures implemented collectively for positive change [15].

The lowest-rated dimension in our study was “Hospital management support for patient safety” (W4) at 13.4%. Only 9.1% of respondents in our study agreed with “Hospital management provides a work climate that promotes patient safety”. Improving this aspect of safety culture requires all teams (employees and management) to work together towards common goals, such as enhancing patient safety [16].

Only 39.21% of our respondents perceived the “Overall perception of safety” (W5) positively, similarly to the Warsaw respondents [10]. “Frequency of event reporting” (W8) urgently requires improvement: 30.3% of positive responses were received; Warsaw studies showed 50% [10]. This issue is not exclusive to Poland; European studies report similar challenges (Sweden – 38.1%; Spain – 43.4%; Croatia – 47.2%; Hungary – 57.9%) [17].

Responses to “When a mistake is made that could harm the patient but does not, how often is this reported?” were positive in 40.8% (always or often reported), but over a quarter of respondents said such errors were never or rarely reported. In the compared study [10], 57.2% were acknowledged. Why are adverse events not reported? Studies in anaesthesiology and intensive care using the HSOPSC questionnaire found that 85.6% believed it was their responsibility to report adverse events [18]. Despite this, 51.9% who witnessed or participated in an adverse event did not report it. Reasons included fear of consequences and belief the event did not significantly affect the patient [18].

“Hospital Handoffs & Transitions” (W11) was mainly based on interpersonal communication. The positive responses for this dimension comprised 38.57% (our research) and 52.5% (compared research [10]). Only one in five respondents in our research believed “Problems often occur in the exchange of information across hospital units” (one in four in Warsaw). Reasons may include haste, workload, inaccuracies, staff errors, or communication issues [19, 20]. A partial solution could be drug reconciliation, creating a coherent list of medications used by the patient, ensuring medical staff always have access to the current list, updated

by various staff members from primary health care to hospital departments [21, 22].

The collected data show that “Nonpunitive response to error” (W12) received the lowest rating (20.51% – own research, 26.7% – Warsaw hospitals [10]). Meta-analyses have shown that this was the worst-assessed dimension in most studies [6–8]. In our research, 62.8% of respondents feared their errors might be used against them (47.4% in Warsaw [10]).

Accreditation standards by the Center for Monitoring Quality in Health Care (CMJ) state that systems for collecting data on adverse events must not be used to identify and stigmatise those involved [23]. Despite CMJ accreditation, our study’s hospital showed that these systems and standards often failed. Hospital staff feared that their recorded mistakes could be used against them, leading to concerns about mobbing by employers, which remains a significant issue in hospitals [24].

In our study, a positive correlation was found between the statement “Staff feel that their mistakes are held against them” and the overall perception of patient safety. People who believe their mistakes are or will be used against them had lower assessments of overall patient safety than those who did not. Our study confirmed Dr. Eng. Robert Mołdach’s opinion, a member of the Expert Council at the Patient Rights Ombudsman [25], that “to create a culture of safety, one must first create a culture of fair treatment. In the event of an adverse event, the focus should be on ‘what went wrong’ rather than ‘who is to blame’”.

Our study allowed us to distinguish factors influencing the assessment of some aspects of patient safety culture, such as professional group affiliation, and length of service in the hospital. Specifically, physicians assessed the items included in W10 (Staffing) much better than nurses/midwives ($p = 0.03$). Medical doctors were also found to report more adverse events than nurses/midwives ($p = 0.004$). This was in line with other studies such as those conducted in public hospitals in China [26], where physicians were more likely to report high overall patient safety grades compared to nurses. The differences in perceptions of patient safety culture between nurses and physicians have been found elsewhere, but in several settings the findings are different, with nurses having more positive assessments in certain areas [27, 28].

The length of service at the hospital was also an important predictor of some aspects of a patient safety culture: employees with > 10 years of service rated the items included in W3 dimension (“Organisational learning – continuous improvement”) higher than those with < 10 years of service ($p = 0.03$). This is in line with others, for example [29]. However, the length of service in our study was not statistically associated with frequency of adverse event reporting ($p = 0.71$).

We also found that employees who believed their mistakes were or would be used against them rated

overall patient safety more negatively than those who did not ($p < 0.001$). This perception can lead to lower morale and increased stress among employees, which negatively impacts their ability to provide safe patient care. A survey of US hospital employees revealed that the concepts of workplace safety culture and patient safety culture were fundamentally interconnected, and both were essential components of a robust and healthy safety culture [30].

A key limitation is the small sample size ($N = 78$) and single-centre design, which limits generalisability to other healthcare settings with different organisational and cultural contexts. The response rate was relatively low (39%), but similar rates (~40%) have been reported in international studies using paper-based HSOPSC questionnaires [31].

Conclusions

Analysing patient safety culture helps develop effective strategies for improving patient care quality and healthcare services. The HSOPSC questionnaire is a good tool for assessing patient safety culture in hospitals. It detailed hospital employees' opinions and identified which aspects need improvement. The study showed that one of the hospitals in the Małopolska Voivodeship in Poland requires improvement in 11 out of 12 dimensions. The results are similar to other hospitals in Poland. The conclusions of the analysis can facilitate targeted solutions, reduce adverse events, and improve error reporting processes.

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Ethical approval

The study was conducted in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of the Hospital and Hospital Director. Approval numer: DO-060-27/23.

Conflict of interest

The authors declare no conflict of interest.

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