

JUST CULTURE MATURITY QUESTIONNAIRE VALIDATION IN A POLISH HOSPITAL

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Purpose: (To present the results of the statistical validation of just culture maturity questionnaire (JCMQ), used to recognize the maturity level of JC among nurses in the hospital in Poland.

Methodology: (The case study and 5-stage research with the use of a 5-point Likert scale questionnaire with 28 statements, distributed among nurses. The results were statistically processed with Statistica 13.1 software.

Findings: We confirmed the reliability of JCMQ what helped to recognize the level of JC maturity as “wisdom”. The improvement actions were proposed. The priority in this respect seems to be education and constant, undistorted communication and knowledge exchange.

Originality: To the best knowledge of the authors, this is the first article in Central Europe and Eastern Countries referring to JC maturity assessment in a hospital setting, and addressed to nurses. The results allow indicating the level of JC maturity concerning Ph. Crosby maturity grid.

Keywords: just culture assessment; patient safety, nurses.

Category of the paper: Research paper.

Introduction

The discussion on the essential and necessary characteristics of the quality of healthcare services has been systematically evolving over the years (Fatima, Humayun, Iqbal, Shafiq, 2019). Quality in healthcare is a comprehensive concept and prioritized by individual countries as well as by aspiring medical institutions. According to The Institute of Medicine (IOM), quality of care is the degree to which health services for individuals and populations increase

the likelihood of desired health outcomes and are consistent with current professional knowledge (Busse, Panteli, Quentin, 2019). World Health Organization (WHO) in its “Handbook for national quality policy and strategy” (2018a) points out that quality health services across the world most of all should be: (1) effective: providing evidence-based health care services to those who need them; (2) safe: avoiding harm to people for whom the care is intended; and (3) people-centered: providing care that responds to individual preferences, needs, and values. Besides, according to the Handbook (WHO, 2018a), to strengthen the value of quality in health care, health services must be: timely, equitable, integrated, and efficient.

The critical component of healthcare quality (HQ) is patient safety (PS), defined as the “absence of preventable harm to a patient during the process of healthcare” (WHO, 2018b). It is recognized as fundamental to all aspects of health care services (Maher et al., 2019), whereas a patient safety culture (PSC) is perceived as a key element of any activities and efforts were undertaken to improve patient safety and to provide a relevant level of medical care (Edwards, 2018). For this reason in healthcare organizations focused on continuous improvement the patient safety culture plays a very important role in everyday practice (Bishop & Cregan, 2015). It seems to be a peculiar and irreplaceable potential of a medical organization, contributing to appropriate behaviors, attitudes, and beliefs toward perceiving patient safety as one of their highest priorities. This article focuses on just culture (JC), the specific component of patient safety culture, reflecting the behavior in the situation of medical error and helping people to distinguish between responsible and irresponsible activities (Marx, 2019). Improvement in this area requires knowledge about the level of just culture maturity in the work environment. This can be obtained, among others, by systematically measuring just culture maturity. Therefore the purpose of the manuscript is to present the results of the statistical validation of just culture maturity questionnaire (JCMQ), used to recognize the maturity level of JC among nurses in the hospital in Poland. The research questions are as follows: (1) Is the developed JCMQ reliable and can it be used to assess JC maturity? (2) What is the level of JC's maturity among nurses in the studied hospital? (3) Which of the analyzed aspects can be considered the strongest? (4) Which of the analyzed aspects should be refined?

We tackled this topic because of its poor recognition among practitioners and researchers dealing with healthcare quality in Central Europe and Eastern Countries (CEECs). A review of the literature available in the PubMed (Medline) database published during the period 1998-2020 confirms the research gap in this regard. After entering the phrase “just culture” only 117 publications referring to this topic directly (by keywords) or indirectly were identified (state as of May 2020) and none of them came from the researchers affiliated in this region.

The idea of just culture

Any organization, including a medical one, has its own organizational culture, which represents the shared ways of thinking, feeling, and behaving in healthcare organization) and it is supported by different and specific subcultures. According to Mannion and Davies, (2018), healthcare organizations have specific characteristics, often consistent with those of other cultures, which make up the picture of the organization. They are like connected vessels feeding the overall OC and those specific components intensify each other and allow managers to look more holistically at OC in healthcare organization (HCO) while seeking quality improvement.

Bearing in mind the need to improve the quality of medical services, the quality culture (QC) in HCO appears as a part of OC focused on the quality of healthcare services and its continuous improvement. Creating QC is a challenging but necessary prerequisite for eliminating medical errors and ensuring patient safety (Edwards, 2018), therefore a patient safety culture (PSC) will always be an important part of it. PSC as the element of QC is the component of OC and is a set of values, beliefs, attitudes, and standards regarding what is important in HCO in terms of patient safety. Developing a quality and safety culture is crucial for the patient and staff welfare. It is perceived as one of the key factors in improving patient safety in healthcare and preventing medical errors (Santa, Borrero, Ferrer, Gherissi, 2018). Moreover, the vital component of PSC is just culture (Saber, Jamshidi, Rajabi, Seydali, Bairami, 2017; Armstrong, 2019), which can be defined as the element of OC, and in parallel, the part of PSC, that helps healthcare organizations to move away from responding to errors and near misses with “shame and blame” and encourages and rewards people for speaking up freely about safety-related concerns (Barnsteiner & Disch, 2017). PSC as an idea comes from the concept of safety culture and gained significance after the explosion of the Chernobyl nuclear reactor in 1986 (Wiśniewska, 2018). Since the publication of the famous report “To Err is Human” in 2000, this phenomenon has become more and more noticeable in the medical area. For the authors of this article, the opinion on PSC presented by AHRQ (American Healthcare Research and Quality) seems to be the most appropriate: “the patient’s safety culture is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behavior that determine the commitment to, and the style and proficiency of, an organization’s health and safety management” (<https://psnet.ahrq.gov>). It was James Reason who for the first time introduced the concept of JC into the practice, however, this phenomenon was first applied to healthcare by David Marx (Edwards, 2018), the American risk management specialist who describes JC in healthcare as follows: “Within healthcare, the just culture is model of workplace justice intended to create fairness for providers and create a better outcome for patients. It is about creating a common language to evaluate provider conduct. A just culture helps create an open reporting culture. To create better patient safety outcomes, a just culture shifts the focus from errors and outcomes to system design and the facilitation of good

behavioral choices” (Marx, 2019). As the authors, we identify ourselves with the definition proposed by AHRQ, according to which JC is a culture that “...recognizes that competent professionals make mistakes and acknowledges that even competent professionals will develop unhealthy norms (shortcuts, “routine rule violations”), but has zero-tolerance for reckless behavior” (<https://psnet.ahrq.gov>). AHRQ agrees that the goal of JC in healthcare is to promote the attitude of reporting errors by those who made them, but also in a situation when a given medical staff representative notices the error or violation made by other healthcare employees. Patient safety depends on the existence of a quality culture (QC), a culture of patient safety (PSC), and just culture (JC) in the organization (see Fig. 1). This has been argued by many researchers and institutions (e.g.: Barnsteiner & Disch, 2017; Saberi et al., 2017; Edwards, 2018; Santa et al., 2018; Marx 2019; Armstrong, 2019).

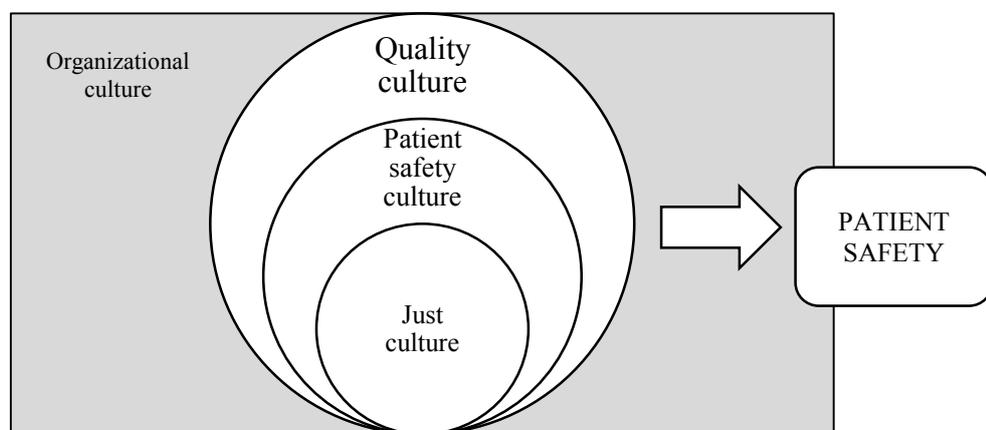


Figure 1. QC, PSC, and JC and their influence on PS. Source: own elaboration.

Having in mind the research problems and the aim of the article, it should be noted that in JC the purpose is not only to identify responsibility for a particular medical error but first of all to solve the problem and to find its roots. Based on the literature one can conclude that many problems may result from the lack of: the relevant reporting system (Ramirez et al., 2018), the management commitment and support (Alzahrani, Jones, Rizwan, AbdelLatif, 2019); the relevant and fair management behavior when mistakes appear (Boysen, 2013); the necessary equipment and materials (Bahreini, Doshmangir, Imani, 2018); an effective and fast communication with the superiors (Norouzinia, Aghabarari, Shiri, Karimi, Samami, 2016) as well as an effective feedbacks to resolve conflicts constructively (Hardavella, Aamli-Gaagnat, Saad, Rousalova, Sreter, 2017); the sufficient professional training (Armstrong, 2019); the knowledge on the causes of potential threats (Hooker, Etman, Westra, van der Kam, 2019); trust among the employees (Paradiso & Swenney, 2017); time (Stergiopoulos, Brown, Felix, Grampp, Getz, 2016); the relevant management behavior when an error occurs (A complimentary publication..., 2017); learning from mistakes (A complimentary publication..., 2017); paying attention on cause-and-effect analysis (Hooker et al., 2019), teamwork (Rosen et al., 2018). The very important seems to be the fear of punishment and of being denounced by other employees (Stergiopoulos, 2016; Vozir & Yurtkoru, 2017). Therefore persons reporting errors have to be protected against any action brought against them

by the employer, except the cases of intentional gross negligence (Paradiso & Sweeney, 2017, 2019; Browne & Haysom, 2019).

To sum up, JC is a culture that creates a balance between blame and blamelessness and between punishment and non-punishment. It creates conditions for trust, for open and fair discussion to facilitate the responsible reporting of errors.

An important way to recognize whether these conditions are met is to conduct systematic research in this area. Assessment of attitudes and behaviors is a reliable measure for evaluating the efficacy of patient safety programs (Saber, Jamshidi, Rajabi, Seydali, Bairami, 2017). However, so far there are still too few tools to measure JC. Probably the first model was presented by von Thaden and Hoppes (2005). In 2011 Barger *et al.* proposed the tool for gap assessment of hospital adoption of JC principles, but the most popular seems to be a model developed by Petschonek *et al.* (2013). The first model consists of twenty statements divided into four criteria: “Reporting Systems”, “Response and Feedback”, “Accountability” and “Basic Safety” arranged into a 7-point Likert scale questionnaire, from 1 - “strongly disagree” through 7 - “strongly agree” (von Thaden & Hoppes, 2005). The second tool comprises two parts. Part 1 measures organizational culture through 13 questions about organizational policies, adverse event investigations, and human resources actions. This section is completed by the patient safety officer after reviewing a representative sample of documents related to these three areas. Part 2 measures the perceptions of leaders about the organization’s culture through 20 questions about critical behavioral indicators, such as system design, coaching, reporting, responses to human error, responses to reckless behavior, severity bias, equity, and transparency. For each statement, response categories were presented on a 5-point Likert scale ranging from “strongly disagree” (-2) to “strongly agree” (2) with a neutral value (0) for “neither etcagree nor disagree” (Barger, Marella, Charney, 2011). The third model is the 27-item questionnaire, categorized into six dimensions: “Balance”, “Trust”, “Openness in Communication”, “Quality of the Event Reporting Process”, “Feedback and Communication About Events” and “Overall Goal of Continuous Improvement”. Also in this case the seven-point Likert scale was used (Petschonek *et al.*, 2013). To some extent, the following models, recognized by the European Patients’ Forum as the tools for PSC assessment and potentially suitable for use during accreditation, may also be recommended to measure JC: Hospital Survey on Patient Safety Culture (HSOPSC), Manchester Patient Safety Framework (MaPSaF), Safety Attitudes Questionnaire (SAQ), because among the items that make up these tools, there is a possibility to exclude those with a direct relationship to JC. For example, in HSOPSC, developed by AHRQ, within the United States Department of Health & Human Services, in the last version 2.0 published in 2019, such items can be found mainly in four out of six sections, like A: Your Unit/Work Area; B: Your Supervisor, Manager, or Clinical Leader; C: Communication; D: Reporting Patient Safety Events. Significant in this regard is section C, entirely related to JC (<https://www.ahrq.gov/sites/...>). Bearing the above in mind, a given HCO can choose a ready-to-use JC assessment model and adapt it to itself, it can also modify existing PSC measurement tools or to implement its own, validated solutions, adequate to its needs.

Methods

The case study to validate the questionnaire used to assess JC maturity was carried out in one of the medium-sized public hospitals in the Pomeranian Voivodship, in Poland, with the following departments: general surgery, trauma, and orthopedic surgery, internal medicine, urology, neurological rehabilitation, intensive care, pediatric, cardiological, and emergency surgery. Due to the sensitivity of the results, the condition for conducting the study, imposed by the hospital management, was confidentiality and concealing the name of the hospital and its exact location. The study was divided into 5 general stages (see Table 1), however, the whole research was inspired and based on W.E. Deming's four-step PDCA cycle (Patel & Deshpande, 2017): (1) P (plan) – planning and developing the questionnaire, (2) Do (do) – contacting with the hospital and questionnaire administration, (3) C (check) – the validation of JCMQ and JC maturity assessment, and (4) A (act) – conclusions and recommendations preparation. To assess the level of JC's maturity, a maturity grid developed by Ph. Crosby was used, as recommended for hospitals by Nwabueze (1995).

Table 1.
The stages of the research

PDCA cycle	Stage No.	Description	Methods
Plan	1	Developing a questionnaire	Conceptual work method
	2	Contacting with a hospital quality representative (HQR) and explaining the purpose and principles of the study	N/A
Do	3	Administration the questionnaire, with the help of HQR; conducting the research	Questionnaire survey method
Check	4	The validation of the questionnaire; JC maturity assessment Discussion and analysis of the collected results, with the presence of HQR	Method of statistical analysis Method of analysis and synthesis
Act	5	Preparation of conclusions, with the presence of HQR	Method of synthesis and logical reasoning

Source: own elaboration.

The questionnaire (see Table 2) consists of 28 items (one A4 sheet). Having in mind the tools and scales established by von Thaden and Hoppes (2005), Barger et al. (2011), and Petschonek et al. (2013), the following aspects of the just culture idea were proposed: GEN – general rules (questions 1-7), REP – reporting (questions 8-14), RES – responsibility (questions 16-20) and REA – reaction (questions 21-28). They were assisted by a 5-point Likert scale. The JCMQs were distributed in individual hospital departments among all nurses, after a short explanation of the purpose of the study by superiors suitably instructed by HQR. The employees were informed that participation in the survey is optional and anonymous. They were asked to leave the questionnaires in a box prepared for this purpose. As a result, 73 completed questionnaires were received (5 of which did not contain opinions on all statements). Thus, the number of questionnaires used to validate the measurement scale and develop the test results was 68 (35 % of respondents). The calculations were carried out using the appropriate procedure of the STATISTICA 13.1 package.

Table 2.
JCMQ (before validation)

1. Medical staff underwent the necessary training to do the work in a safe way for the patient	1 2 3 4 5
2. Patient safety is a priority regardless of costs	1 2 3 4 5
3. Medical staff receives the necessary equipment, auxiliary materials, to perform work in a safe way for the patient	1 2 3 4 5
4. Medical staff receives the necessary help from supervisors if they have doubts about the safety rules	1 2 3 4 5
5. Improvements to patient safety are systematically introduced	1 2 3 4 5
6. When there are incidents that can affect/affect the patient's safety, this is mainly due to system or technological reasons (R)	1 2 3 4 5
7. When incidents occur that can affect/affect patient safety, they usually result from human error (R)	1 2 3 4 5
8. Medical personnel can report comfortably for themselves mistakes/incidents that threaten the patient's safety, committed by others	1 2 3 4 5
9. Medical personnel can report comfortably for themselves mistakes/incidents threatening the patient's safety, committed by themselves	1 2 3 4 5
10. Medical personnel can report comfortably for themselves any deviations that may lead to mistakes/incidents, even if no harm has been done to the patient	1 2 3 4 5
11. Staff do not have enough time to report the above-mentioned errors/incidents (R)	1 2 3 4 5
12. The main obstacle in reporting the above mistakes/incidents is fear of punishment (R)	1 2 3 4 5
13. The main obstacle in reporting the above mistakes/incidents is a fear of accusing others of informing (R)	1 2 3 4 5
14. Medical staff discourage each other from reporting errors / incidents (R)	1 2 3 4 5
15. If the medical personnel violates the procedures, the rules contributing to the threat to the patient's safety they are immediately disciplined by the superiors	1 2 3 4 5
16. If the medical personnel violates the procedures, safety rules, it is immediately disciplined by the superiors, even when it does not have a direct impact on the patient	1 2 3 4 5
17. If the medical personnel violates the procedures, rules, contributing to the threat to the patient's safety, it is immediately disciplined by other personnel	1 2 3 4 5
18. Disciplining personnel by supervisors does little to improve the violation of procedures and security rules (R)	1 2 3 4 5
19. Disciplining personnel by other personnel does little to improve the violation of procedures and security rules (R)	1 2 3 4 5
20. If an incident occurs, first of all, the supervisor is looking for a guilty one (R)	1 2 3 4 5
21. The medical staff immediately reacts to problems concerning the patient's safety	1 2 3 4 5
22. If the medical staff reports problems related to patient safety, appropriate decisions and actions are taken	1 2 3 4 5
23. If there is an error/incident, both the superiors and the employees take this very seriously	1 2 3 4 5
24. If an error/incident occurs in our branch, the explanatory team looks at each step in the process to determine how they could have occurred	1 2 3 4 5
25. Positive conclusions are drawn from errors	1 2 3 4 5
26. I am convinced that the reaction of our superiors to a given problem is always fair to a given employee	1 2 3 4 5
27. Supervisors discuss with us all the problems that arose concerning the patient's safety	1 2 3 4 5
28. We know nothing about the errors/incidents and their consequences (R)	1 2 3 4 5

1 – strongly disagree, 2 – disagree, 3 – not disagree and not agree, 4 – agree, 5 – strongly agree, R – reverse question.

Source: own elaboration based on study results.

The results of the JCMQ validation

For the purpose to assess the quality of the scale used in JCMQ there was a need to assess its reliability. The criterion validity was analyzed employing multivariate analysis within each item framework. Principal Component Analysis (PCA) was applied to determine convergence validity and to assess the redundancy of the questionnaire. The cumulative variability of each principal component was analyzed (see Table 3).

Table 3.

Cumulative variability of principal components within each item framework of the questionnaire

General rules (questions 1-7)									
Principal component	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9
Cummulative variability [%]	37.74	53.44	68.99	80.69	89.54	95.29	100	-	-
Reporting (questions 8-14)									
Principal component	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9
Cummulative variability [%]	39,89	68,39	80,63	87,84	94,33	97,78	100,00	-	-
Responsibility (questions 16-20)									
Principal component	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9
Cummulative variability [%]	60,32	82,70	92,15	96,95	100,00	-	-	-	-
Reactions (questions 20-28)									
Principal component	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	PC9
Cummulative variability [%]	38,31	53,72	67,57	77,32	86,18	93,13	96,65	100,00	-

Source: own elaboration based on study results.

The results presented in Table 3 confirm the low redundancy of the data collected with this questionnaire. Each of the questions brings additional, new information. The reliability refers to a measurement that supplies consistent results with equal values (Taherdoost, 2016) and it measures consistency, precision, repeatability, and trustworthiness of research. Formally, reliability is defined as the proportion of the variance of true results to the variance of results obtained. The measurement is reliable if the results obtained on a given scale in the subsequent measurements are the same or very similar. The most frequently mentioned methods of assessing reliability are the method of repeating the measurement (test-retest) and the method of determining the internal consistency (homogeneity) of the scale using the α -Cronbach coefficient. The first one is based on the estimation of the inter-period compliance of results. The method of determining internal consistency using the α -Cronbach coefficient allows to determine the degree to which the elements forming the scale (JC aspects) are correlated and coherent with the measurement of the concept they represent (Taber, 2018). The α -Cronbach coefficient is calculated according to the formula (1) (Cronbach, 1951):

$$\alpha = \left(\frac{k}{k-1} \right) \left(1 - \frac{\sum_{i=1}^k \sigma_i^2}{\sigma_s^2} \right) \quad (1)$$

where:

k – number of scale items (here 28 items),

σ_i^2 – variance of the i- position,

σ_s^2 – total scale variance.

This coefficient takes values from 0 to 1. The high reliability of the scale is indicated by the α values greater than 0.7 (Taber, 2018). The statistical analysis of survey data on the 28 questions forming the JCMQ construct to assess the reliability of this scale was done. To determine the values of the α -Cronbach coefficient, all 28 statements were treated as elements of one scale - without separating the subscales marking specific sub-areas within this scale.

The obtained value of the α coefficient for the adopted scale consisting of 28 positions (variables P1-P28) of the research tool was 0.613. In the “Alpha if deleted” column of the table, the values of the α -Cronbach coefficient for individual scale positions are calculated following the principle – “will the α coefficient for the scale increase if one of the elements with the weakest correlation with the scale is eliminated?” (Taber, 2018). It can be stated that item P15 does not meet the condition of consistency concerning other items of the scale. After removing position number 15, the α -Cronbach coefficient will increase to an acceptable value of 0.714. Therefore, further analysis and conclusions obtained as a result of the research presented in this article will be based on 27 positions of the just culture scale, i.e. statements 1-14 and 16-28.

The results of JC maturity assessment in the studied hospital and discussion

To identify the JC maturity level the average value from the answers of all respondents was calculated for each question. Then the average of these values was calculated. The answers to the reverse questions (P6, P7, P11, P12, P13, P14, P18, P19, P20, and P28) were adequately recalculated to obtain JC maturity value on a scale of 1-5. JC maturity value of the studied organization is 3.40 ($\sigma = 0.92$), which corresponds to 68% of the maximum expected value (see Table 4).

Table 4.
Just culture maturity value

Question No.	Average (reverse questions included)	Σ	Just culture value (average of averages) (1-5 scale) within the category	JC value [%] within the category	Just culture value (average of averages) (1-5 scale) in total	JC value [%] in total
1	4.35	0.48	GEN 3.25	65	3.40	68
2	3.99	0.64				
3	4.04	0.54				
4	4.21	0.41				
6	2.83	0.65				
7	3.32	0.69				
8	4.00	0.59				
9	4.15	0.52	REP 2.94	59		
10	4.06	0.82				
11	1.92	0.87				
12	2.01	0.99				
13	2.13	1.21				
14	2.33	1.32				
16	3.93	1.13				
17	3.54	1.24	RES 3.05	61		
18	3.21	1.21				
19	2.39	1.16				
20	2.20	1.14				
21	1.72	0.45				
22	4.17	0.50				
23	4.42	0.52				
24	4.21	0.53	REA 4.17	83		
25	4.06	0.60				
26	4.08	0.44				
27	4.24	0.43				
28	2.32	1.16				

Source: own elaboration based on study results.

The fact and the nature of the validation of the proposed JCMQ made it possible to indicate the overall level of JC maturity in the examined hospital, in the context of nursing personnel behavior. Bearing in mind Ph. Crosby maturity grid (Nwabueze, 1995), by analogy, it can be stated that the level 68% corresponds to “wisdom”, assuming that 1%-20% corresponds to “uncertainty”, 21%-40% - to “awakening”, 41%-60% - to “enlightenment”, 61%-80% - to “wisdom”, and 81%-100% - to “certainty”. Given the above, it is also possible to evaluate JC maturity within each category as follows: GEN – “wisdom”, REP – “enlightenment”, RES – “wisdom”, REA – reaction “certainty”. The data obtained also allowed to gather knowledge about certain beliefs and behaviors, from the perspective of individual statements. Having in mind the research questions, it was possible to identify the most positive reactions and behaviors in the hospital in terms of JC criteria included in JCMQ. According to the results, it turned out that all nurses (100%) agree and strongly agree that they have the necessary and important professional training (Armstrong, 2019) on how to work in a safe way (P1) and receive the relevant help and support from the superiors in case of doubts as to the safety rules (P4). Nurses in 100% confirm (P27) that the superiors discuss with them the arising

problems. One can note that in the situation of any uncertainty, it is necessary to provide effective and fast communication with the superiors (Norouzinia et al., 2016). An equally positive (99%, P23) is the fact that both employees and supervisors treat all errors very seriously, and that the reaction of the superiors to a given problem is always fair (94%, P26). In the studied hospital there is a possibility of comfortable reporting of mistakes made by the staff (P9, 96% of respondents agree and strongly agree). Nurses admitted that they could easily report any deficiencies that may lead to errors, even if they did not cause any harm to the patient (P10, 92% of respondents agree and strongly agree). Moreover, in the event of such an error, the appointed team explains its origin and cause (P24, 94% of respondents agree and strongly agree). In our opinion, there is evidence of an atmosphere of trust in the hospital, as well as a very positive response to P8-P10. Paradiso and Swenney (2017) confirmed a strong positive correlation between trust and JC alignment, and the results of research conducted by Stergiopoulos (2016) indicate that lack of time and fear of punishment are some of the major obstacles in this regard. 89% of respondents agree and strongly agree (P8) they can easily report errors affecting PS committed by others. Appropriately 84% (P11) and 79% (P12) nurses disagree and strongly disagree that these factors constitute any barriers. Slightly more cautious, however, the nurses referred to informing (P13) because only 71% agree and strongly agree that the main obstacle to reporting errors could be fear of being denounced by co-workers. Nurses declared strongly and very strongly that in the case of irregularities, appropriate decisions and actions are taken (97%, P22) and that they receive the necessary equipment and materials to work for patients in a safe way (P3, 90%). Fairly high consistency of responses was observed in the case of a similar issue included in the P5 statement, as 87% of respondents reacted positively that the hospital uses facilities that improve the patient's safety. Improving the condition and number of facilities is an important element of healthcare, regardless of its specificity. They are essential for modern healthcare delivery (Bahreini et al., 2018). Most of the nurses agree and strongly agree (P2 – 87%) that PS is a priority, regardless of costs.

Other areas of concern should be looked at a little more critically, and in our opinion, they should be refined. Regarding P6 and P7, more than half of the respondents have no opinion on whether incidents affecting PS stem from systemic or technological reasons (63%) or human error (55%). This situation can be considered as worrying, as it may indicate a lack of sufficient knowledge on the causes of potential threats, or that no cause-and-effect analysis is considered as a basic tool to reduce or minimize the occurrence of adverse events of different origins (Hooker et al., 2019). Only 58% of respondents disagree and strongly disagree that the personnel is discouraged from reporting errors or incidents of a negative nature (P14), and as many as 21% admit that such a situation happens. This is a serious problem and for this reason, the management should be aware that when medical staff decide reporting non-conformities and errors, they may face dilemmas about who and how to report their comments and claims. Moreover, the lack of sense of safety and a fear of retaliation, and the lack of feedback may affect the quality and completeness of the report (Vozir & Yurtkoru, 2017,

Hardavella et al., 2017). Not very positive impression comes from the fact that only 88% of respondents (P16) agree and strongly agree that violating safety rules is immediately disciplined by superiors, which means there are cases of lack of management commitment and response, whereas managers' response in this respect is regarded as an important determinant of PSC (Alzahrani et al., 2019). The same can be said about concluding the mistakes (P25, 85%). There is evidence that talking about errors and teamwork in this regard influence reducing errors and improving the quality of patient care (e.g. Boysen, 2013; Rosen et al., 2018). However nearly 70% (P20) of nurses denied that when the mistake occurred, first of all, the supervisor is looking for a guilty one, and all respondents admitted that the personnel immediately responded to problems concerning PS (P21), 18% (P28) of nurses admitted that their knowledge of errors occurring in the hospital is unsatisfactory. This means it would be necessary to pay more attention to feedback, which in the case of JC and in general – P SC, is not only an important element of education but also a motivational factor. A similar situation occurs when there is a need for mutual disciplining by the staff (P17). Nurses with such experience are only 20% and as many as 33% of respondents agree and strongly agree that disciplining does not translate into improved performance (P18). This may mean that management does not conduct adequate and systematic supervision in this regard, is inconsistent, or has no authority among a certain group of staff. Because an important element of JC is proper management and staff behavior when an error occurs (Boysen, 2013), the response to the P19 statement was to allow to recognize the role of personnel in the mutual discipline. Although 60% of respondents felt that it was effective, the fact that 22% of respondents said that it contributed little to improving safety behavior, is not satisfactory.

It can also be noted that the category reaction (REA) was the best, however, the weakness of the existing approach is undoubtedly reporting (RES). The above means that following the observed willingness to act quickly in the event of non-compliance, appropriate actions should be taken to document them within the framework of a system that everyone trusts (Ramirez et al., 2018).

After analyzing the results of the study in the presence of HQR, she agrees that the conducted research and the collected results have indicated the stronger and weaker aspects of existing patient safety practices in terms of PSC and JC. However, we are aware of some limitations associated with the study. The first one can be a small number of respondents, which means that the obtained results can't be generalized and they have meaning within the sample obtained (voluntary participation). Besides, respondents were asked to spoke about this subject for the first time. Although the study was anonymous and discretion was provided, there was probably some concern among nurses about expressing an opinion on such a sensitive matter. Secondly, the study was only quantitative, so HQR agree that in the future it should be carried out in parallel with other methods, especially qualitative, e.g.: observations at the workplace, direct interviews with nurses, focus group interviews, or mystery shopping. A combination of such methods and their systematic use might help to better recognize hidden

motives, different nuances, real and potential problems, and difficulties, and to confirm whether the desired rules and requirements are followed and respected by employees (Wiśniewska, 2018), which in the case of JC and PSC is certainly crucial.

Implications of research

The theoretical implication related to the research and the considerations contained in the article is to draw attention to the role of just culture in ensuring patient safety and emphasize its relationship with the culture of patient safety and, more broadly, the culture of quality. The practical implication of the research is to extending the set of tools to measure the level of JC maturity, and thus indicate its possibilities and limitations in the context of wider application.

Conclusions

JCMQ presented in this article has been validated in terms of the reliability of the measurement. After removing one of the items of the pre-proposed diagnostic scale (P15), the coefficient of internal consistency (α -Cronbach) has an acceptable value in the light of the views presented in the scientific literature. Taking into consideration the results of the research and the level of JC maturity recognized as “wisdom”, there is a need to indicate some strong and some weak aspects of just culture in the studied hospital. The fact that the staff undergoes various appropriate training and can count on the support of superiors if they have doubts about compliance with the PS rules, can be considered very positive. Certainly, a very important issue is the fact that in the surveyed institution there is a climate conducive to reporting errors, which proves trust in the management. The next is the fact that every such mistake is taken seriously, and that PS is a priority. However, there are still many areas for improvement. First of all, HQR agrees that it seems necessary to broaden the subject of training to include issues such as cause and effect analysis of errors and their consequences. Next, it is important to conduct a series of training with a specialist in psychology on the subject of error reporting and mutual disciplining of employees, during which the problem of whistleblowing codex seems to be necessary to discuss. Important is also the problem of insufficient consistency and reaction of the superiors in situations of emerging exceptions, as well as the need for effective information sharing. According to HQR, in this case, a good idea seems to be to introduce systematic and ongoing management meetings with the staff regarding patient safety problems, as well as to create an internal, anonymous knowledge exchange platform. The education and constant, undistorted communication is a pre-requisite for the success of any change, including changes

in beliefs and behaviors constituting just culture. Last, but not least, JC maturity measurement should be repeated systematically. It shouldn't be treated as a one-time action. Only then it will be valuable and useful, both for the hospital and the patient. Just culture is more than policy (Paradiso & Sweeney, 2019), it is an obligation. Therefore, this instrument may be recommended and used for further research e.g. to compare attitudes in different groups of medical staff in the same hospital or to compare JC maturity in two different organizations that provide medical services. We believe that JCMQ applied in the study may become a model for other researchers, both scientists and practitioners, also from outside Poland, especially for researchers from CEECs, but not only. Before JCMQ implementing this approach, the following guidelines can be taken into account. First of all the questionnaire should be validated in terms of use, regarding the relevant national language limitations. Next, with the mobility of staff (hiring medical personnel from abroad) in mind, one can also consider the cultural factor. Therefore it will be necessary to select an appropriate sample for the study to draw generalized conclusions. As the questions concern very sensitive issues that may affect the willingness and openness of answers, the condition for conducting the study is to organize a short training session and explain how important the study is to the healthcare facility, especially for the patient's well-being. In this case, both immediate supervisors and representatives of quality management should play a very important role. Last but not least, in our opinion, the use of JCMQ should be additionally supported by the use of qualitative assessment methods, such as systematic audits, observations of employees in the workplace, or mystery shopping.

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