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ABSTRACT

Neurosurgery is a high-risk speciality, so the Patient Safety Culture should become a priority to improve patient safety and the quality of medical care. The purpose of the study was to explore the perception of Patient Safety Culture (PSC) among the staff in the neurosurgical departments of the Republic of Moldova.

A cross-sectional study was conducted in neurosurgical departments using the Hospital Survey on Patient Safety Culture (HSOPSC). Descriptive statistics were carried out, comprising the Cronbach "α" coefficient, frequency of positive answers (PPRs), and level of minimum and maximum of 95% confidential interval. PPRs by question and dimension were analysed overall and classified according to the Harrington scale.

Medical staff from five hospitals voluntarily participated in the study. Most of the respondents rated the patient's safety grade as excellent and very good. The value of the frequency of positive responses to the dimensions of the survey varies between 37.3% (nonpunitive response to error) and 85.0% (teamwork within units). The dimensions with the highest score of the PPRs stand out: „teamwork within units”, „organizational learning- continuous improvement” and „supervisor/manager expectations and actions promoting patient safety”. The dimension with a high score of PPRs was „feedback and communication about error”. The dimensions with a satisfactory score of the PPRs were „handoffs and transitions”, „frequency of events reported”, „management support for patient safety”, „teamwork across units”, „communication openness”, „overall perceptions on patient safety”, „non-punitive response to errors” and „staffing”.

For the first time in the Republic of Moldova, the perception of patient safety culture in neurosurgery departments was studied. The results reflect the positive attitude of the staff towards most dimensions of the patient safety culture. The study made it possible to highlight the strong and vulnerable points of the patient safety culture in neurosurgical departments from Moldova.

INTRODUCTION

Patient safety is a strategic priority for modern health care and is central to countries' efforts in working towards universal health coverage (1).

Keywords
patient safety culture,
neurosurgery,
patient safety



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Developing a culture of safety is cardinal to any sustainable efforts towards patient safety improvement (1).

According World Health Organization patient safety is a framework of organized activities that creates cultures, processes and procedures, behaviours, technologies, and environments in health care that consistently and sustainably: lower risks, reduce the occurrence of avoidable harm, make error less likely and reduce its impact when it does occur (2). Incident: any deviation from usual medical care that either causes an injury to the patient or poses a risk of harm, including errors, preventable adverse events and hazards (2). Adverse event: an incident that results in preventable harm to a patient (2)

Every year, large number of patients are harmed or die because of unsafe health care, creating a high burden of death and disability worldwide, especially in low- and middle-income countries. On average, an estimated one in 10 patients is subject to an adverse event while receiving hospital care in high-income countries. Available evidence suggests that 134 million adverse events due to unsafe care occur in hospitals in low- and middle-income countries, contributing to around 2.6 million deaths every year. The social cost of patient harm can be valued at US\$ 1 trillion to 2 trillion a year (1).

In neurosurgery, little is known about the frequency of adverse events and the contribution of human error (3) According Hanno S. Meyer (2021) one in four patients treated at an academic neurosurgical tertiary care centre experiences at least one adverse event. Most adverse events occurred during (19.6%) or after (76.3%) surgery (3). More than one in four of the cases with adverse events were associated with human error (25.9%). The most frequent class of human performance deficiency (HPD) was execution (18.3%). Another relevant HPD was planning or problem solving (5.6%). Rules violation accounted for 1.7% of adverse events cases. (3)

Mardon RE(2010) explored the relationships between Hospital Patient Safety Culture and Adverse Events and found that hospitals with a more positive patient safety culture scores had lower rates of in-hospital complications or adverse events (4). The study supports the idea that a more positive patient safety culture is associated with fewer adverse events in hospitals (4).

The Global Patient Safety Action Plan strives to eliminate avoidable harm in health care with the vision of “a world in which no one is harmed in health care, and every patient receives safe and respectful care, every time, everywhere” (1).

According to AHRQ patient safety culture is the extent to which an organization's culture supports and promotes patient safety. It refers to the values, beliefs, and norms that are shared by healthcare practitioners and other staff throughout the organization that influence their actions and behaviours. Patient safety culture can be measured by determining the values, beliefs, norms, and behaviours related to patient safety that are rewarded, supported, expected, and accepted in an organization (5). It is believed that in order to reduce the number of adverse events, hospitals have to stimulate a more open culture and reflective attitude towards errors and patient safety (6). A strong safety culture is not only core to reducing patient harm, it is also critical for providing a safe working environment for health workers. This includes creating a psychologically safe work environment, whereby health workers can speak up regarding patient safety and other concerns without fear of negative consequences (1).

“Changing our culture to advance patient safety” served as the theme of the 81st Annual Meeting of the American Association of Neurological Surgeons (7). The neurosurgeon of the future has to embrace the ideals of individualism and innovation while never giving up the art of medicine, prioritizing the doctor-patient relationship, and changing our culture to practice the science of medicine within systems that help us to understand and prevent errors from occurring (7). Leaders should be educated in the importance of safety culture, and they need tools to help create this culture (8). In addition, many organizations now use standard surveys to measure culture, although many struggle with how to improve in low-scoring areas (8). The AHRQ Surveys on Patient Safety Culture™ (SOPS®) are surveys of providers and staff that assess the extent to which their organizational culture supports patient safety and safe practices (9). The areas of patient safety culture assessed by the AHRQ SOPS surveys include: Communication About Error, Communication Openness, Organizational Learning—Continuous Improvement, Overall Rating on Patient Safety, Response to Error, Staffing,

Supervisor and Management Support for Patient Safety, Teamwork, Work Pressure and Pace (9).

As of September 2022, there are 107 known countries where the AHRQ Surveys on Patient Safety Culture™ (SOPS®) have been administered (10). As of September 2022, there are 56 known translations for the AHRQ Surveys on Patient Safety Culture™ (SOPS®) (11). The European Network for Patient Safety (EUNetPas) has been an important promoter of this tool in Europe. One of the aims of the EUNetPas project was “Promoting a Culture of Patient Safety” (12).

The original US Hospital Survey on Patient Safety Culture (HSOPS), designed by the American Agency for Healthcare Research and Quality (AHRQ) in 2004 was translated in Romanian and experimented in Romania. The study explored the psychometric properties of the Romanian version of the US HSOPS and found that Psychometric properties of the Romanian version of the HSOPS tested in Romania was acceptable for nine composites with 31 items (13). Then a cross-sectional study which measured the patient safety culture was carried out in six hospitals, located in four Romanian regions by Tereanu C et al (2017)(14). The study shows that staff perceptions of most areas of patient safety were positive although reporting of adverse events was low(14). Later a cross-sectional study was conducted in Moldovan healthcare settings, using the Romanian translation of the US Hospital Survey on Patient Safety Culture HSOPSC (15). The results of the study suggested that staff avoid to openly report adverse events and/or discuss errors, likely because a poor understanding of the potential of these events for learning and because of fear of blame or punitive actions (15). Also, the phenomenon of underreporting of adverse events was mentioned in the study by Turcanu T. et al in 2010 regarding patient safety, medical errors, and event reporting in Moldova (16).

Currently, the Republic of Moldova does not have in use any tool to assess patient safety culture in hospital settings (15). Therefore, the actuality of the problem was associated with the lack of research on the Patient safety Culture of neurosurgical patients during hospitalization and the high risks of medical care for patients with neurosurgical diseases.

The purpose of the study was to explore the perception of patient safety culture among the staff

in neurosurgical departments from Republic of Moldova.

METHODS

A cross sectional study was conducted in neurosurgical departments from Moldova using the Hospital Survey on Patient Safety Culture (HSOPSC) Romanian version, developed by the US Agency for Healthcare Research and Quality, created by Sorra J, Yount N, Famolaro T, et al. (17). The research project was approved by the Research Ethics Committee of State University of Medicine and Pharmacy “Nicolae Testemitanu”, Republic of Moldova on 19.06.2018.

The survey was distributed from January till September 2019 in neurosurgical departments in five hospitals from Republic of Moldova. There was voluntary involvement in the survey 345 doctors, residents, and nurses. We distributed paper form questionnaires to 400 members of medical staff. The questionnaire was anonymously completed. The surveys that did not meet the requirements for completion of the AHRQ guide were excluded. Overall, 345 completed questionnaires were returned, which constituted the 86% response rate. Completed surveys were collected and digitized. Statistical analyses were performed using IBM SPSS Statistics 26. The matrix of results was created. The survey contains forty-two questions and two output indicators: one question asks the respondents to appreciate the patient safety grade and another question asks about the number of events reported during the last 12 months.

The survey questions used Likert scale of 5-point response options of degree of agreement: 1 point mean strongly disagree, 5 points -strongly agree, and the frequency 1 point mean never, and 5 points mean always. For negatively worded items, percentage of positive responses is the percentage of respondents who answered “Strongly disagree” or “Disagree,” or “Never” or “Rarely,” because a negative answer on a negatively worded item indicates a positive response (17). We recoded negatively worded items to calculate an item percent positive score. We averaged the percent of positive scores for each item included in the composite measure, to calculate score on a particular safety culture composite measure as described the AHRQ guide (17). Descriptive statistics were carried out, comprised the Cronbach “α” coefficient, frequency of positive answers PPRs, variance, standard error, level

of minimum and maximum of 95% confidential interval. PPRs by question and dimension were analysed overall and classified according to Harrington scale (18).

RESULTS

For the first time we explored the staff perception about patient safety culture in neurosurgical departments from five hospitals providing in-patient hospital care. 345 persons voluntarily participated in the study. From 345 respondents there were: doctors - 124- 36.0%, nurses- 172- 49.8%, residents-49-14.2%. All of respondents were in direct interaction or contact with patients. Most of respondents 173 (50,1%; Îl 95% [44,6-55,1]) were worked in neurosurgery units and 172 (49,9%; Îl 95% [44,9-55,4]) were worked in anaesthesiology and intensive care units where neurosurgical patients received medical care. The distribution of respondents by intervals of years of work experience in the hospital showed that a third of them have a work experience in the hospital 1-5 years-109 people (31,6%; Îl 95% [27,0-36,5]), and another third had 21 and more years of work experience - 122 people (35,4%; Îl 95% [30,1-40,6]). The distribution of respondents by intervals of years of work experience in the unit showed that: 1-5 years -38.6 % respondents, 6-10 years-18.6% respondents, 11-15 years -10.7% respondents, 16-20 years -9% respondents, > 20 years -23.2 % respondents. The results showed that a half of respondents worked 40-49 hours per week Figure 1.

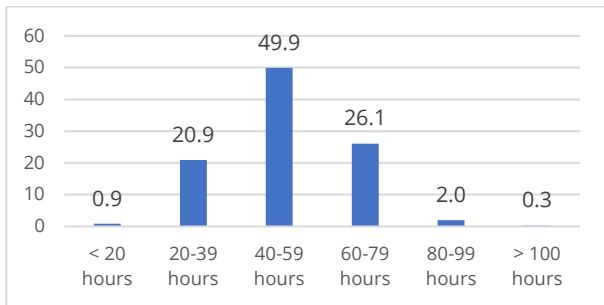


Figure 1. Distribution of respondents according to working hours per week, %.

The output indicator -frequency of adverse events reported in the last 12 months by respondents reflects that the most part of staff did not report any adverse events during last year of activity Figure 2.

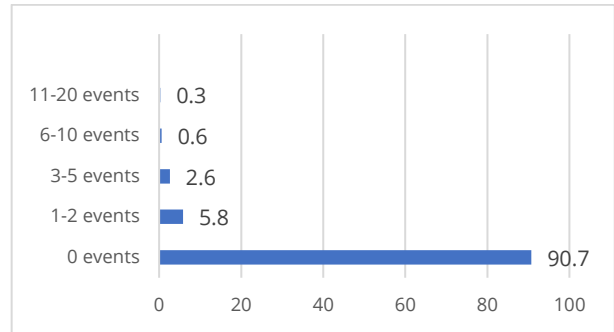


Figure 2. Frequency of adverse event reported in the last 12 months, %.

Most of the employees rated the patient's safety grade as excellent- 39,1 % and very good 43,8%. Table 1 reflects the staff perception of patient safety grade.

Table 1. Patient Safety Grade -output indicator.

Patient Safety Grade -points	Frequency of responses			Patient Safety Grade
	Abs.	%	95% CI	
9-10	135	39,1	33,9-44,1	Excelent
7-8	151	43,8	38,6-48,0	Very good
5-6	44	12,8	9,3-16,5	Acceptable
3-4	11	3,2	1,4-5,2	Poor
1-2	4	1,2	0,3-2,3	Failing

Table 2 express the item and composite positive scores for the patient safety culture with 95% confidence intervals.

Table 2. Item and Composite Percent Positive Scores for the Patient safety culture with 95 % confidence intervals.

Code	Composites and items	Abs.	%	95% CI
D I Teamwork within units		1173	85,0	83,1-86,9
A1	People support one another in this unit	301	87,2	83,8-90,7
A3	When a lot of work needs to be done quickly, we work together as a team to get the work done	310	89,9	86,7-92,8
A4	In this unit, people treat each other with respect	292	84,6	80,9-88,1
A11	When one area in this unit gets really busy, others help out	270	78,3	73,6-82,9

D II Supervisor/manager Expectations and Actions Promoting Patient Safety		1117	80,9	78,9-83,0
B1	My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures	311	90,1	87,0-93,0
B2	My supervisor/manager seriously considers staff suggestions for improving patient safety	285	82,6	78,8-86,7
B3r	Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts	220	63,8	58,8-68,7
B4r	My supervisor/manager overlooks patient safety problems that happen over and over	301	87,2	83,8-90,7
D III Organizational Learning-Continuous Improvement		839	81,1	78,7-83,4
A6	We are actively doing things to improve patient safety	276	80,0	75,7-84,3
A9	Mistakes have led to positive changes here	288	83,5	79,4-87,2
A13	After we make changes to improve patient safety, we evaluate their effectiveness	275	79,7	75,7-83,8
D IV Management Support for Patient Safety		613	59,2	56,2-62,2
F1	Hospital management provides a work climate that promotes patient safety	228	66,1	60,9-71,3
F8	The actions of hospital management show that patient safety is a top priority	228	66,1	60,9-71,3
F9r	Hospital management seems interested in patient safety only after an adverse event happens	157	45,5	40,3-50,8
D V Overall perceptions on Patient Safety		611	44,3	41,7-46,9
A10r	It is just by chance that more serious mistakes	105	30,4	25,8-35,1

	don't happen around here			
A15	Patient safety is never sacrificed to get more work done	96	27,8	22,9-32,8
A17r	We have patient safety problems in this unit	178	51,6	46,4-56,8
A18	Our procedures and systems are good at preventing errors from happening	232	67,2	62,0-72,2
D VI Feedback and Communication About Error		792	76,5	73,9-79,1
C1	We are given feedback about changes put into place based on event reports	300	87,0	83,2-90,1
C3	We are informed about errors that happen in this unit	220	63,8	58,6-68,7
C5	In this unit, we discuss ways to prevent errors from happening again	272	78,8	74,2-82,9
D VII Communication openness		491	47,4	44,4-50,5
C2	Staff will freely speak up if they see something that may negatively affect patient care	225	65,2	60,3-70,4
C4	Staff feel free to question the decisions or actions of those with more authority	144	41,7	36,5-47,0
C6r	Staff are afraid to ask questions when something does not seem right	122	35,4	30,7-40,3
D VIII Frequency of Events Reported		621	60,0	57,0-63,0
D1	When a mistake is made, but is <i>caught and corrected before affecting the patient</i> , how often is this reported?	215	62,3	57,1-67,2
D2	When a mistake is made, but has <i>no potential to harm the patient</i> , how often is this reported?	210	60,9	55,9-66,1
D3	When a mistake is made that <i>could harm the patient</i> , but does not, how often is this reported?	196	56,8	51,3-62,0

D IX Teamwork Across Units		719	52,1	49,5-54,7
F2r	Hospital units do not coordinate well with each other	122	35,4	30,4-40,9
F4	There is good cooperation among hospital units that need to work together	212	61,4	56,2-66,9
F6r	It is often unpleasant to work with staff from other hospital units	140	40,6	35,1-46,1
F10	Hospital units work well together to provide the best care for patients	245	71,0	66,1-75,9
D X Staffing		515	37,3	34,8-39,9
A2	We have enough staff to handle the workload	135	39,1	33,9-44,6
A5r	Staff in this unit work longer hours than is best for patient care	103	29,9	25,5-35,1
A7r	We use more agency/temporary staff than is best for patient care	147	42,6	37,1-47,8
A14r	We work in "crisis mode" trying to do too much, too quickly	130	37,7	32,5-42,9
D XI Handoffs and transitions		854	61,9	59,3-64,4
F3r	Things "fall between the cracks" when transferring patients from one unit to another	202	58,6	53,3-63,2
F5r	Important patient care information is often lost during shift changes	238	69,0	63,5-73,9
F7r	Problems often occur in the exchange of information across hospital units	192	55,7	50,4-60,9
F11r	Shift changes are problematic for patients in this hospital	222	64,3	59,4-69,3
D XII Non punitive Response to Errors		447	43,2	40,2-46,2
A8r	Staff feel like their mistakes are held against them	207	60,0	54,8-65,5
A12r	When an event is reported, it feels like the person is being written up, not the problem	150	43,5	38,0-48,7
A16r	Staff worry that mistakes they make are kept in their personnel file	90	26,1	21,7-30,7

Table 3. Classification of the results of patient safety culture dimensions according to the Harrington scale.

Grade	Frequency of positive responses %	Level of Harrington scale	Dimension	The total value of dimension %
I.	80-100%	Very good (excellent)	Teamwork within units	85,0
			Organizational Learning-Continuous Improvement	81,1
			Supervisor/manager Expectations and Actions Promoting Patient Safety	80,9
II.	63-79%	Good	Feedback and Communication About Error	76,5
III.	37-62%	Satisfactory	Handoffs and transitions	61,9
			Frequency of Events Reported	60,0
			Management support for patient safety	59,2
			Teamwork Across Units	52,1
			Communication openness	47,4
			Overall perceptions on Patient Safety	44,3
			Non punitive Response to Errors	43,2
Staffing	37,3			
IV.	20-36%	Bad	not identified	-
V.	0-19%	Very bad (critical)	not identified	-

DISCUSSIONS

The ultimate goal of the Global Patient Safety Action Plan is to achieve the maximum possible reduction in unavoidable harm due to unsafe health care globally (1). One from Seven guiding principles establish underpinning values to shape the development and implementation of the action plan is instill a safety culture in the design and delivery of health care (1). Because of its high level of complexity, neurosurgery is a high-risk specialty, and improving patient outcomes has remained central in its spectrum of academic pursuits (19). For the first time was explored the perception on patient safety culture of staff in neurosurgical departments from Republic of Moldova. The staff demonstrates openness to participate in this study and the participation rate was high. The results of the study

express the positive attitude of the staff from the neurosurgery departments towards the culture of patient safety. The study reflects the particularities of patient safety culture in neurosurgical departments from Republic of Moldova with strength and weaknesses. The value of the frequency of positive responses to the dimensions of the survey varies between 37.3% (nonpunitive response to error) and 85.0% (teamwork within units). Russell E. Mardon et al (2010) reflected similar results in their study where the mean HSOPS scores ranged from 42% positive response (nonpunitive response to error) to 79% positive response (teamwork within units) (20).

The mean value of patient safety grade was 7.8 points (CI 95% [7,6-8,0]) from 10 that correspond to very good level of patient safety grade. 39.1% of respondents appreciated as a "excellent" the grade of patient safety, 43.8% - "very good", 12.8%- "acceptable", 3.2%- "poor" and 1.2%- "failing". The results of the study showed that the assessment of patient safety in neurosurgical departments is higher compared to previous studies carried out in the Republic of Moldova and Romania (13) (15). The explanations can be that neurosurgery clinicians have always taken pride in being providers who carry a strong sense of personal responsibility for their patients (19).

Neurosurgery is far from immune to the errors. The complexity of neurosurgical patients and the interdisciplinary teams required to manage their conditions expose these patients to the same errors found in other medical and surgical specialties, along with errors unique to neurosurgery (21). Our study reflects the phenomenon of underreporting of adverse events -about 90 % of respondents did not report any adverse event during the last year. Tereanu C. et al find the same phenomenon in their study in Moldova- 68% of respondents did not report any adverse event in the last 12 months (15) and 73 % in Romania (14). In comparison with Japan "No event reports" was in 34,9 %, Taiwan 48.8% and United States 50.8% (22). Understanding the frequency and danger posed by medical errors, and offering strategies to prevent them, forms the basis of the modern patient safety movement (21). Although voluntary event reporting is often described as an inadequate method to detect patient safety events and is marked by underreporting rates (23). In Moldova, there is no centralized system for mandatory anonymous reporting of adverse events.

The high level of underreporting of adverse events can be explained by the voluntary reporting system. Russell E. Mardon mentioned in 2010 that there tends to be considerable underreporting of events in hospitals, which is problematic because potential safety problems may not be recognized or identified and therefore may not be addressed (20).Maureen L. Falcone mentioned in his study 4 factors accounted for 67.5% of the variance in barriers to reporting medication errors: fear, cultural barriers, lack of knowledge/feedback, and practical barriers. Other barriers include workload, interruptions, and lack of knowledge. Also, an important barrier is providers not prioritizing problems as reportable if they are easily resolved (24).

The Item and Composite Percent Positive Scores with 95 % confidence intervals represented in table 2 highlight the strengths and the weaknesses of the patient safety culture in neurosurgery departments from Republic of Moldova. Their classification was carried out using the Harrington verbal-numerical universal scale, which is used in cases when the answers have a subjective character (18).

Among the dimensions with the highest score of the frequency of positive answers according to Harrington scale, the following dimensions stand out: „teamwork within units”, „organizational learning -continuous improvement” and „supervisor/manager expectations and actions promoting patient safety”. The dimension with a high score of the frequency of positive answers according Harrington scale was „feedback and communication about error”. The dimensions with a satisfactory score according Harington scale of the frequency of positive answers were „handoffs and transitions”, „frequency of events reported”, „management support for patient safety”, „teamwork across units”, „communication openness”, „overall perceptions on patient safety”, „non punitive response to errors” and „staffing”. In our study, no dimensions with a "bad" or "critical" score according to the Harrington scale were identified.

The results of our study reflected that the composite "Staffing" was rated with the lowest score of the frequency of positive responses. The same results reflected in the AHRQ database where this composite was rated with the lowest score of the frequency of positive answers (25). C Tartaglia Reis explain that the staff felt overloaded by the unsuitability of personnel to their work activities,

which can prejudice the quality of care provided (26). Another reason of low score in Moldova could be the insufficient staff of both doctors and nurses, which is why they work more intensively and more hours per week. Lower frequency of adverse event reporting, „Non punitive response to errors” and “Communication Openness” are another weakness points of patient safety culture in neurosurgical departments in Moldova. Maureen L. Falcone et al remarked in their study that fear of blame and retaliation are common reasons nurses and physicians do not report errors (24). The item "Staff worry that mistakes they make are kept in the personnel file" had the lowest level of positive responses and it influenced the composite score. The results suggest the existence of a so-called blame culture in neurosurgical departments,

CONCLUSIONS

For the first time in the Republic of Moldova, the perception of patient safety culture in neurosurgery departments was studied, using an international instrument. The results reflect the positive attitude of the staff from the neurosurgery departments towards most dimensions of the patient safety culture. The study made it possible to highlight the strong and vulnerable points of the patient safety culture in neurosurgical departments, which require prompt intervention to be improved.

The study outlined that the most vulnerable aspect of the patient safety culture is staffing. A particular problem in neurosurgical departments from Republic of Moldova remains the shortage of personnel and the large number of hours worked per week, which negatively influence patient safety, highlighting the necessity to develop policies and implement measures to motivate and influence health specialists to stay working in the medical system.

Another weakness points of patient safety culture in neurosurgical departments which need a prompt intervention for improvement are the Lower frequency of adverse event reporting, along with „Non punitive response to errors” and “Communication Openness”. To change the situation in this sensitive but very important field, it is necessary to develop and to implement a system for reporting of adverse events associated with the medical care, to encourage and to stimulate the adverse event reporting and to develop the culture

of learning from errors. It is important to exclude blaming or punishing those who report or commit errors. To achieve this, it is necessary to organize training courses and constructive discussions to analyse the reported adverse events, so that the staff understand that the goal of this process is to increase patient safety and the quality of medical care.

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