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A COMPARATIVE ANALYSIS ON SAFETY CULTURE IN DOMESTIC AND FOREIGN HEALTH CARE FACILITIES AND ENTERPRISES OF OTHER ACTIVITIES (REPORT 2)

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Abstract. A comparative analysis on safety culture in domestic and foreign health care facilities and enterprises of other activities (report 2). Yavorovsky A.P., Rygan M.M., Naumenko A.N., Skaletsky Yu.N., Gichka S.G., Ivanko A.V., Varyvonchyk D.V., Shkurba A.V., Bugro V.I., Brukhno R.P., Zinchenko T.O., Gorval A.K., Kirichuk I.M. *There were analyzed characteristics of the safety culture of patients and personnel of health care facilities in Ukraine as a whole*

and separately in doctors-pathologists against the data obtained regarding similar indicators of the culture of patient safety in medical facilities of other countries compared with the safety culture of workers of domestic nuclear power plants.. It was confirmed that the weaknesses of the safety culture of the personnel of domestic hospitals is characterized by "Reaction to errorrs", which indicates the prevalence of the culture of blame (unfair culture) in domestic hospitals and, as a result, the absence of real data on medical errors and other incidents of patient safety. The high percentage of positive responses to the safety culture characteristic "Reaction to errors" among the workers of Ukrainian nuclear power plants is an example of the possibility of forming an appropriate safety culture in a separate domestic industry, and the high percentage of positive answers of domestic pathologists regarding this characteristic is a significant potential for the development of a safe hospital environment for patients in Ukraine.

Реферат. Сравнительный анализ культуры безопасности в отечественных и зарубежных учреждениях здравоохранения и предприятиях других сфер деятельности (сообщение 2). Яворовский А.П., Рыган М.М., Науменко А.Н., Скалецкий Ю.Н., Гичка С.Г., Иванько А.В., Варивончик Д.В., Шкурба А.В., Бугро В.И., Брухно Р.П., Зинченко Т.А., Горваль А.К., Киричук И.Н. *Проанализированы характеристики культуры безопасности пациентов и персонала в учреждениях здравоохранения в Украине в целом и отдельно у врачей-патологоанатомов с сопоставлением полученных данных с аналогичными показателями культуры безопасности пациентов в лечебных учреждениях других стран и сравнением с культурой безопасности работников отечественных атомных электростанций. Подтверждено, что слабыми сторонами культуры безопасности персонала отечественных больниц является характеристика «Реакция на ошибки», что свидетельствует о преобладании в отечественных больничных заведениях культуры обвинения (несправедливой культуры) и, как следствие, отсутствии реальных данных о медицинских ошибках и других инцидентах безопасности пациентов. Высокий процент положительных ответов по характеристике культуры безопасности «Реакция на ошибки» у работников украинских атомных электростанций является примером возможности формирования надлежащей культуры безопасности в отдельной отечественной отрасли, а высокий процент положительных ответов по этой характеристике у отечественных патологоанатомов является значительным потенциалом развития безопасной больничной среды для пациентов в Украине.*

Thematic materials published by the WHO and individual countries in 2021 confirm the great interest of the world medical community to the concept of safety culture as an effective tool for preventing patient safety incidents in general.

Thus, the Global Plan of Action for Patient Safety for 2021-2030 [2], adopted by the WHO at its 148th session (January 21, 2021), noted that the driving force in improving patient safety may be the adoption of strategic activities at the highest level of management, including patient safety culture. Next instead of condemnation and punishment is the formation and support, of a culture of openness and transparency as the first prerequisite for creating highly reliable systems and organizing the functioning of the health care sector in the interests of continuous prevention of patients from possible harm.

In the another supplement [12] to the Patient Safety Strategy of the National Health System of the United Kingdom [11], further improvement of patient safety is also associated, first of all, with the wider use of cultural approaches.

That is, we have convincing examples of great interest in the safety culture and high hopes for it in the development of a safe hospital environment, and, accordingly, evidence of the relevance of our study.

Considering this situation, it will be expedient not only to continue research on safety culture in domestic health care facilities (HCF) but to compare it with similar data on HCF in other countries, as well as with employees of domestic nuclear power plants where the concept of safety culture has been cultivated in practice for many years.

For clarity, the results of the safety culture assessment in the HCF of the United States [10] and Sweden [16] were selected as a comparison. Also, for comparison, the safety culture data in HCF of the Russian Federation (RF) were used, where the 30-day survival of hospitalized patients with acute heart attack and stroke [3] is similar to the indicators of Ukrainian HCF [5, 6].

The aim of our study was to continue assessing the commitment to the safety culture of the staff of domestic HCF and comparing the data on the safety culture of medical staff of HCF in other countries, as well as employees of other spheres of activity in Ukraine, where safety culture is at high level.

MATERIALS AND METHODS OF RESEARCH

We analyzed the latest documents of the WHO and individual countries on patient safety (PS), as well as data from a questionnaire on the commitment to the safety culture of domestic health professionals.

The study was conducted in accordance with the principles of bioethics set out in the Helsinki Declaration on Ethical Principles for Human-Based

Medical Research and the Universal Declaration on Bioethics and Human Rights (UNESCO).

Given the similarity and even the identity of many characteristics of patient safety culture in all three Ukrainian health care facilities (UHCF) analyzed in Report 1, we combined these data into one group (167 people), namely: departmental health care facility, city clinical hospital and central district hospital of Kyiv region.

The second group – the data of the questionnaire survey of domestic pathologists (32 people). In this group 87% is represented by specialists who work in hospitals but are not subordinated to the hospital administration – doctors of regional pathology bureaus, and 13% – doctors of pathology departments in the structure of hospitals.

The results of a questionnaire survey on the safety culture of medical workers of the RF [7], the USA [8, 13], as well as employees of domestic nuclear power plants [4] were selected as comparison groups. In this last group of comparison, only two, but extremely important, characteristics of the safety culture are taken into account – "Support of patient safety by the management" and "Reaction to errors".

The questionnaire of the staff was conducted according to a survey of the US Agency for Health Care Research and Quality (AHRQ) [15]. Approaches to assessing the results of the questionnaire are presented in detail in our Report 1. However, in order for this publication to be perceived as a separate work, we considered it appropriate to provide an interpretation of the studied characteristics of safety culture (Table 1).

Table 1

Characteristics and definition of patient safety culture

Characteristics of culture of PS	Determining the characteristics of culture of PS
Teamwork	Hospital units work together and coordinate with each other to provide better patient care
Actions of the management as to PS	The hospital management provides a working climate that is conducive to PS and shows that PS is a priority
Organizational training	Mistakes have contributed to positive change through the continuous improvement of staff work
Support of PS by the management	Managers are positive about the suggestions from staff to improve the PS, assist staff in implementing procedures to improve safety, do not ignore the problems of PS
Reports about errors and feedback	Staff report errors that occur and discuss ways to prevent them
General perception of PS	Error prevention procedures and systems are good and there are no problems with PS
Frequency of reports about errors	Errors have been reported that could have harmed the patient but did not
Openness of communication	Staff members are free to discuss processes that may adversely affect the patient, and do not hesitate to seek advice from more experienced colleagues
Teamwork within the unit	Staff members support each other, treat each other with respect, work together as one team
Staffing	There is enough staff to handle the workload and enough working time to provide the best patient care
Moving inside the hospital	Important information regarding patient care is passed between hospital units and during shifts
Reaction to errors	The staff feels that their mistakes and reports do not have a negative impact on them

The average percentages of positive responses of respondents in the studied and comparison groups were compared according to individual characteristics of the safety culture. If the average percentage of positive answers to questions on a certain characteristic was more than 50%, such a characteristic of safety culture was considered strong, if less than 40% – weak, and in the range between 40% and 50% – relatively strong.

The reliability and internal consistency of the questions in the blocks of the safety culture questionnaire were determined by the Cronbach's alpha factor.

The 30-day survival of hospitalized patients with acute myocardial infarction and stroke was used as an indicator of patient safety.

The frequency of detection of discrepancies between clinical and pathological diagnoses by specialists of pathological bureaus and pathological departments of the HCF was also analyzed.

Statistical estimation was performed according to generally accepted methods using Microsoft Excel (product number: 99409-777-4187945-65411 2007) [1]. The calculation of the minimum sample size for each of the studies was performed for the bilateral critical area (Fisher's exact criterion). In addition to Microsoft Excel, the G*Power 3.1/9/4 package (Erdfelder, Faul, and Buchner, 1992-2012) was used to perform sampling calculations [1].

The research was conducted as part of the research "Scientific substantiation of the optimal risk management system to ensure a safe hospital environment" (state registration number: 0120U101432), which is performed at the Department of Hygiene and Ecology No. 2 of Bogomolets NMU at the request of the Ministry of Health of Ukraine.

RESULTS AND DISCUSSION

The average percentages of positive responses to the question of safety culture characteristics in the studied groups of domestic health workers and in comparison groups are shown in Table 2. More clearly the differences in individual safety culture characteristics in individual groups are shown in the figure.

The Cronbach's alpha coefficient in domestic medical workers was 0.67, and in the group of pathologists – 0.64, which confirms the proximity of the survey to the true.

Table 2

Average percentages of positive responses regarding the characteristics of the SC of domestic medical personnel, personnel of CHCs of other countries and NPP employees

Characteristics	Average percentages of positive responses					
	doctors-pathologists	Ukraine HCFs	RF HCFs	USAHCFs [16]	Sweden HCFs [11]	Employees of NPP
Teamwork	86	82	77	81	53	
Actions of the management as to PS	59	78	38	76	36	
Organizational training	95	91	51	73	62	
Support of PS by the management	58	80	31	72	68	93*
Reports about errors and feedback	50	84	40	67	79	
General perception of PS	64	71	20	66	66	
Frequency of reports about errors	52	62	25	66	49	
Openness of communication	45	82	77	81	53	
Teamwork within the unit	56	82	52	62	79	
Staffing	46	53	74	55	54	
Moving inside the hospital	27	68	54	47	59	
Reaction to errors	46	23	38	44	65	80

Note. * Security management support.

The data in Table 2 show significant differences in the average percentages of positive responses in most characteristics in both the study and comparison groups.

According to the characteristic "Teamwork" we have the closest indicators in all groups, with a slightly lower figure in Swedish HCF (53%), but in all groups this characteristic is a strong point of patient safety culture. Characteristics of "Actions of management as to PS" are the weak point of the safety culture in HCF of the RF (38%) and the HCF of Sweden (36%). "Organizational training" is a strong point of safety culture in all groups, with the lowest rates demonstrated by the HCF of the RF (51%) and the HCF of Sweden (62%). The weak point of the safety culture in the characteristic "Support of PS by the management" was found only in the HCF of the RF (31%), and the highest assessment of this characteristic was given by employees of domestic nuclear power plants (93%). "Reports about errors and feedback" is a relatively weak point of the safety culture (40%) in the HCF of the Russian Federation. In domestic pathologists an average percentage of positive responses to this characteristic is also relatively low (50%)). "General perception of PS" only in the HCF of the Russian Federation is a weak point of the safety culture (20%). The "Frequency of reports about error" is a weak point of the safety culture in the HCF of the Russian Federation (25%) and a relatively weak in the Swedish HCF (49%). The percentage of positive responses to this characteristic of safety culture was also relatively low among domestic pathologists (50%). Conditionally weak characteristic of the culture of patient safety in pathologists is the characteristic "Openness of communication" (45%). "Teamwork within a unit" in all research and comparison groups is a strong point of the safety culture. "Staffing" received the highest percentage of positive responses in the HCF of the RF (74%), and relatively weak point of the safety culture was noted by pathologists (46%). The characteristic "Moving inside the hospital" was noted as weak (27%) and relatively weak (47%) point of patient safety culture by domestic pathologists and medical staff in Ukraine in general.

Of particular note are the positive responses to the "Reaction to errors", being one of the key components of a safety culture.

According to this characteristic, the lowest rate of positive responses and, accordingly, the weak point of the safety culture is in domestic HCF (23%), followed by the HCFs of the RF (38%). In the US HCF, the percentage of positive responses is 44%, which corresponds to the relatively weak point of the patient safety culture. In the Swedish hospital environment, the "Reaction to errors" is a strong point of the patient safety culture (65%).

In general, the indicators of patient safety culture in terms of "Reaction to errors" and the level of patient safety indicators in the form of patient mortality within 30 days after hospitalization for acute myocardial infarction and stroke clearly correlate. The higher the rates of positive responses to the patient safety culture, the higher the 30-day survival rates of patients with acute myocardial infarction and stroke [10, 16], and the lower the average percentage of positive responses to this characteristic, the lower the 30-day survival rate of patients hospitalized for acute myocardial infarction and stroke [3, 5, 6].

A fair safety culture which corresponds to a high percentage of positive responses to the characteristics of patient safety culture "Reaction to errors", provides a high level of registration of medical errors, as noted in Swedish and the US HCF [9]. There are no systems for registering patient safety incidents in both Ukraine and Russia, which is evidence of a lack of proper interest in hospital safety issues.

Encouraging fact for domestic medical practice is that the highest rate of positive responses to the characteristics of safety culture was observed in specialists of domestic nuclear power plants (80%), and in domestic pathologists (46%) this figure was even higher, than in US health workers (44%). That is, with the appropriate managerial efforts of the industry leadership and commitment to the safety culture of business leaders, as evidenced by the experience of forming a positive safety culture at domestic nuclear power plants, in Ukraine one can develop a commitment to safety culture in a particular industry. At the same time, domestic pathologists show significant potential for building a safe hospital environment, including through the mobilization of cultural approaches.

That is, the more carefully the staff registers and analyzes medical errors, which is typical of a fair safety culture, the more quickly the problems of PS are identified and eliminated.

This is partially confirmed by domestic practice (Fig.). In pathology bureaus, where, as already noted, the commitment of specialists to safety culture is quite high, cases of discrepancies between clinical and pathological diagnoses are registered much more often than in hospitals, where pathology departments are structural units and where medical staff, according to the conducted research, demonstrates a lower commitment to the safety culture.

This, among other things, encourages the accelerating formation of an appropriate regulatory framework for the functioning of institutions

(pathological bureaus) and structural units (pathological departments, histological laboratories), which conduct pathological research, because the

regulatory order for pathological services expired in 2015 [11], and a new order has not yet been adopted.
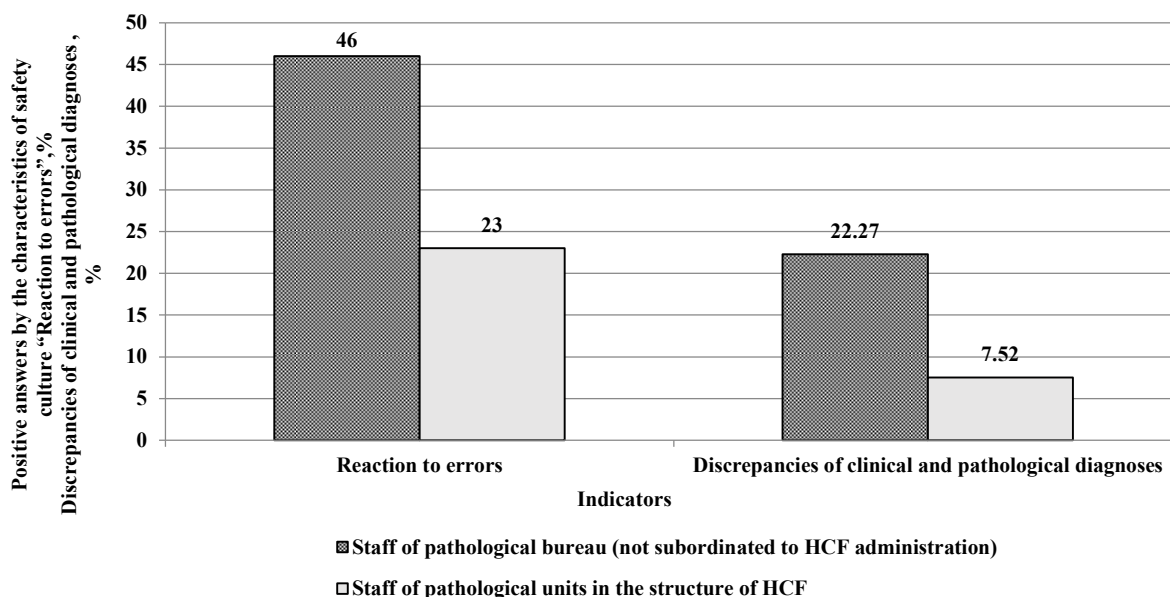
**The relationship between the level of patient safety culture
and the discrepancies between clinical and pathological diagnoses**

CONCLUSION

1. Comparative studies of safety culture in domestic and foreign health care facilities have confirmed the close relationship between the level of commitment to patient safety culture with the actual state of patient safety.

2. The low average percentage of positive responses to the patient safety culture "Reaction to errors" among domestic health workers may indicate a predominance of accusations in them as one of the main reasons for inadequate identification and elimination of patient safety problems.

3. Commitment to safety culture in terms of "Reaction to erros" and "Support of by management safety" in the staff of domestic NPPs is much higher than in the staff in all studied hospitals. Experience of the nuclear energy industry on cultural approaches in

the field of safety as ideal models for building a hospital environment safe for patients is promising.

4. High rates of commitment to the culture of patient safety, especially in terms of "Reaction to errors" in domestic pathologists confirm the expediency to continue reforming pathology service and its greater involvement in improving patient safety, including through the formation of a proper regulatory framework.

5. The next steps in the above area should be aimed at identifying the root causes of the formation of problems related to safety culture, with further development of measures to address these causes.

Conflict of interest. The authors declare no conflict of interest.

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