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Key Skill Management in Operating Room – Evaluation of Perioperative Nurse´s Skills

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Abstract: The Key Skills Management in Operating Room (KSMOR) was an ERASMUS+ project that assessed key skills, knowledge, procedures and the degree of adaptation of perioperative nurses in operating theatres in the countries of the European Union (EU).
Five EU countries participated in data collection. The respondents were perioperative nurses divided into two groups (with experience in operating rooms up to 2 years and over 2 years). The third group consisted of operating theatre managers who participated in the data collection and subsequently evaluated the user-friendliness of the questionnaires used for the data collection. The user-friendliness of the questionnaires was also assessed by all the perioperative nurses participating in the data collection.
The majority of respondents from the Czech Republic rated the level of knowledge/skills at a good level, i.e. 2 points ("You are independent, you manage the procedure normally in your daily routine"), even for the group of the respondents with the length of experience in operating rooms up to 2 years. Both the managers and the perioperative nurses assessed the user-friendliness of the questionnaire on skills and knowledge of perioperative nurses positively.
The output of the KSMOR project is an electronic version of the questionnaire on skills and knowledge of perioperative nurses, which enables evaluation and training of perioperative nurses not only in basic skills but also in very specific ones according to the particular field. It is also a suitable tool for the operating theatre manager for the management and evaluation of perioperative nurses, planning and support of educational activities and its subsequent integration into the operation of operating theatres.

Keywords: *perioperative care; basic/specific skills/knowledge; user-friendliness.*

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Introduction

The World Health Organization recommends in its documents support of indicators of the quality of surgical care, which assess, among other things, the number of perioperative nurses "*The most critical resources of operating teams are the knowledge and experience of the constituent clinicians — the surgeons, anaesthetists, nurses and others"* (WHO, 2009). The occurrence of perioperative complications and adverse events depends on several factors. These include construction and technological equipment of the operating theatres, the management process, the level of skills and education of medical staff, compliance to standards, and continuous monitoring of the occurrence of perioperative complications and adverse events. Perioperative care is dynamically developing and places considerable demands on all health care professionals who participate in it. The perioperative nurse is a highly specialized profession that requires high-level professionals. Therefore, a European ERASMUS+ project (the second of its kind) Key Skill Management in Operating Room (KSMOR) was dedicated to perioperative nurses. Only a competent perioperative nurse can guarantee the patient effective care with a minimum of postoperative complications (AORN, 2019a). In particular, new operating theatre nurses, whether graduates or experienced perioperative nurses coming from another facility or another specialization, need to be provided with appropriate comprehensive training so that they can apply the full range of their competencies (Mollohan & Morales, 2016).

Perioperative care is provided immediately before, during and after surgery (EORNA, 2019). A number of health professionals participate in perioperative care, including surgeons, anaesthesiologists, anaesthesiology and perioperative nurses, and other specialists. Their presence depends on the field of surgery (perfusiologists, biomedical engineers, X-ray assistants, etc.). One of the key participants in perioperative care is the perioperative nurse (AORN, 2019b). *The role of the perioperative nurse is to establish and sustain system equilibrium before, during and after the procedure by assisting the patient coping with the intrinsic and extrinsic stressors of the operative and invasive procedure environment and by facilitating the work of physician and the anaesthesia provider during the procedure* (Phippen et al., 2009). The perioperative nurse participates in patient care in several roles – as an instrumentalist, a circulating nurse (as set within the competencies in the Czech Republic), etc. In some countries of the EU, perioperative nurses also include anaesthesiology nurses and nurses who treat patients in the recovery rooms. Therefore, the competencies of nurses differ in different countries. Similarly, the education of perioperative

nurses in the member states of EU differs (EORNA, 2019a, 2019b). The effort to unify the competencies of perioperative nurses and increase the quality of perioperative nursing care motivated the authors of the KSMOR project to prepare and implement it.

Key Skills Management in Operating Room is a project that focused on the education of perioperative nurses, their key skills, knowledge, procedures and degree of adaptation in operating rooms in the countries of the EU. The project was supported by the European Operating Room Nurses Association (EORNA) and the professional organization of perioperative nurses in the Czech Republic (Czech Association of Nurses - Perioperative Nurses Section).

The purpose of the KSMOR project was to compare the results of knowledge and skills of perioperative nurses in several EU countries at different stages of their professional careers, and then create an electronic tool for assessing the level of skills/knowledge, education and training of perioperative nurses in EU countries.

Five EU member countries participated in the KSMOR project within the ERASMUS+ framework: France (the project executor and the main researcher), Belgium, Finland, Greece, and the Czech Republic. In the Czech Republic, the project partners were the Faculty of Medical Studies of the University of Pardubice and three medical facilities in which the data collection took place - the University Hospital Brno, the Hospital Pardubice and the Central Military Hospital Prague. The authors of the paper were co-researchers of an international project for the Czech Republic.

Activities related to the solution of project objectives were implemented in the period from November 2016 to November 2019. Representatives of all the partners met regularly at meetings to discuss issues of the number and structure of respondents in each participating country, evaluation of respondents' answers, methods of translating questionnaires from English to mother tongues of their respective countries, promotion of the project, and support of professional organizations in the data collection.

Literature review

Perioperative care, as well as other specializations of general nurses, is changing to meet the ever-increasing demands on the quality and the range of skills required from perioperative nurses. This issue also involves motivation for lifelong learning and the possibility of evaluating the quality of care provided (Altinay et al., 2020). Therefore, various programs emerge

to develop the clinical skills and knowledge of nurses. Such an example are residency programs for specialist nurses (Battié, 2013).

The task of institutions educating perioperative nurses is to ensure the knowledge and skills in the full range and complexity of perioperative care which "requires unique specialty knowledge, skills, and abilities "(Byrne & Culbertson, 2016). These requirements are incorporated into the curricula of the relevant educational programs so that they meet the goals identified by The World Health Organization (WHO) and the United Nations (UN). These organizations "identified sustainable development goals for 2030 for healthy lives and wellbeing for all by developing a plan to improve global health and to reduce mortality worldwide in noncommunicable disease through medical and surgical intervention " (Pettorini & Gullatte, 2020). When integrating / adapting perioperative care graduates into everyday operation, it is important that theory meets the practice, and also personal commitment of each member of the perioperative team. This is an essential condition for application of acquired knowledge / skills in providing the specialized nursing care (Russell & Coventry, 2019).

Approximately 321 million surgical procedures are performed annually worldwide (Rose et al., 2015), thus placing a huge responsibility on all participants in perioperative care. "During the perioperative period, patients are highly vulnerable and largely dependent on the surgical staff "(Sillero Sillero & Zabalegui, 2018). Therefore, all participants are looking for ways to make perioperative care as safe as possible. An example is the Enhanced Recovery After Surgery (ERAS) program (Liu et al., 2018) and other procedures designed to reduce / eliminate postoperative complications (Wainwright et al., 2020). Their task is also patient-centered care in the physical and mental areas, despite the fact that the operating rooms use a variety of sophisticated procedures and equipment. "The most important tool throughout the perioperative process is just health care workers " (Arakelian et al., 2017; Wichsova & Horakova, 2018).

The influence of healthcare professionals on the quality of care for surgical patients can hardly be expressed exactly. Nevertheless, tools are repeatedly created to increase and evaluate the quality of care provided (Forsberg et al., 2015). One of such tools is undoubtedly the electronic questionnaire for evaluating the level of skills either of perioperative nurses in the adaptation process or nurses with long-term performance of specialization in operating rooms created in the described project.

Aim of the research

The aim was to create an electronic tool to test the skills of perioperative nurses in European Union countries.

Methods

The respondents of the research were perioperative nurses, currently employed in operating theatres. The inclusion of the respondent was based on their consent and ensuring full anonymisation of identification data (name, medical facility, length of practice, etc.). All respondents confirmed their willingness to be included in the research by his signature.

The research tool, questionnaires were created jointly by the project partners.

The respondents were divided into two groups for the purposes of data collection. The first group consisted of nurses with experience of up to 2 years in operating theatres; the latter group consisted of respondents with experience longer than two years. The first group answered questions concerning basic skills.

The questionnaire had a total of 217 closed questions, which examined the safety and professionalism of the perioperative process from the point of view of a scrub nurse and a circulating nurse. The second group of nurses (with more than two years of experience in the operating theatres) answered questions on key skills according to the respective field of the respondents. A total of 8 fields were included (orthopaedics, abdominal surgery, traumatology, etc.). Individualized questionnaires ranged from 23 to 100 closed questions.

The last group of respondents consisted of 3 operating room managers in the Czech Republic, who assessed the user-friendliness of the questionnaires in terms of scope, content, comprehensibility of questions, time requirements, etc. The user-friendliness of questionnaires was also assessed by the group of more experienced nurses (those with experience over 2 years), a total of 48 respondents.

The questionnaires were translated from English into the mother tongues of the countries participating in the project. In the Czech Republic, the translation was carried out by a medical professional and, subsequently, the text was corrected by two specialists in perioperative care to ensure the comprehensibility of the questions and appropriate professional terminology of perioperative care.

All questionnaires listed 3 possible answers (0 points "You were never trained for this task", 1 point "You know the procedure, but you cannot say that you would always manage it", 2 points "You are independent, you manage the procedure normally in your daily routine"). The answers were always verified by the operating room manager or trainer. In case of different evaluation of skills by the perioperative nurse and the manager/trainer, a discussion took place, after which there was an agreement in the evaluation of the degree of mastery of the particular skill.

After the data collection completion, the whole project was evaluated using the focus group method, in individual countries which were attended by the researchers, participating perioperative nurses and operating room managers.

The representation of the number of respondents within the participating countries is shown in Table 1. The data presented do not include the results of the survey of France (the main researcher) as its research had a different scope and the data have not been provided.

Table 1 Participants of the study

		Belgium	Finland	Greece	Czech Republic	**Total**
Number of Hospitals		4	1	16	3	**24**
Number of participants for the test	ORN	35	16	15	48	**115**
	Head ORN	5	6	16	3	**30**
Number of participants in the focus group		12 ORN students	16 ORN students	5 ORN + 5 Head ORN	2 Head ORN + 2 managers	**42**

Source: Authors' own conception
Comment: ORN – perioperative registered nurse, Head ORN – head perioperative registered nurse

Results

Data collection and evaluation of results with all project partners complied to a uniform methodology. The total number of respondents in the project (including the Czech Republic) was 187, the number of respondents from France has not been provided.

The following results present data obtained from the Czech Republic. 48 perioperative nurses were contacted and included in the survey,

all were women and their average age was 40.22 years. The average length of practice in operating theatres was 12.61 years. The shortest period of experience in an operating theatre was 0.5 years, the longest 40 years.

15 (31.2%) perioperative nurses who worked in operating rooms for up to two years answered a total of 217 questions. 33 perioperative nurses with experience in operating theatres over 2 years (68.7%) answered, on average, 70 questions evaluating key skills in their particular field. All closed questions had the same three 3 answers.

Most of our respondents rated the level of skills at a good level, i.e. 2 points ("You are independent, you manage the procedure normally in your daily routine"), even in a group of respondents with the shorter experience in operating rooms (i.e. up to 2 years). The only exceptions were procedures that are not part of the competencies of perioperative nurses in our country (e.g. antisepsis of the surgical site, hand washing instead of disinfection, a trolley with Caesarean section instrument set). The results of the respondents' answers for the Czech Republic are shown in Table 2.

Table 2 Results Czech Republic

	Number of participants	Average grade
Common Basis	15	1.86
Orthopaedics	5	1.75
Visceral surgery	8	1.61
Robotic surgery	2	2
Cardiosurgery	4	1.52
ENT	4	1.85
Ophtalmosurgery	2	2
Neurosurgery	5	1.59
Endoscopic surgery	3	1.98
Total	48	1.80

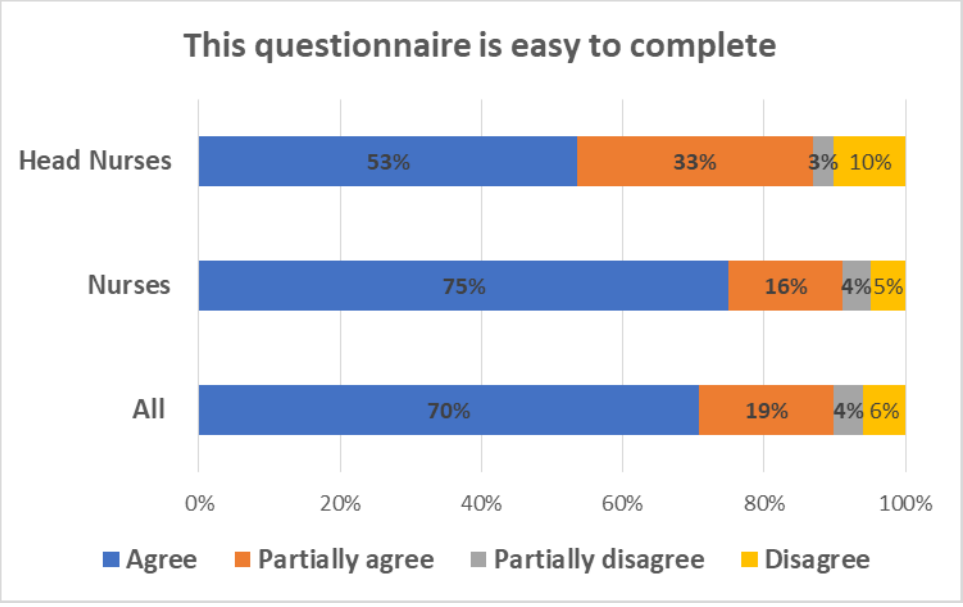
Source: Authors' own conception

Comment: ENT - ear, nose and throat

Overall, 70% of respondents found the questionnaire easy to complete. The questions were assessed as "clear" and "understandable", and the vocabulary adapted and easy to understand. The method of answering was well understood. More than 80% of respondents are satisfied with the time required to complete the questionnaires (Greece 84%, Czech Republic 94%, Belgium 77%, Finland 14%). 74% of respondents rated the tool as suitable for their working activity. The impact of the on the improvement of skills and knowledge was appreciated more by the head OR nurses (69%)

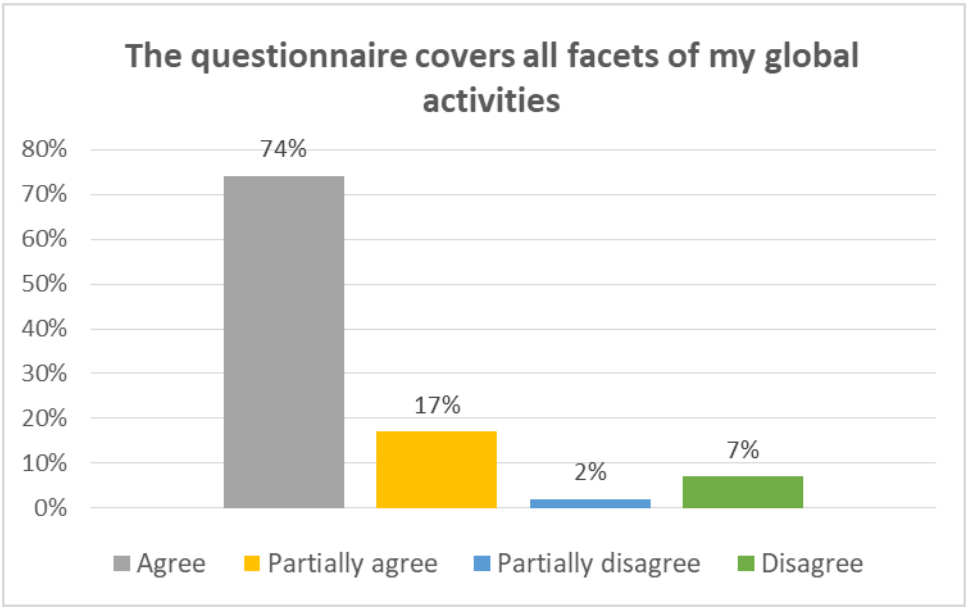
than OR nurses (47%). Head ORN also considered that multi-skills table can be used for annual assessments (61% agree, 18% partially agree). 50 % OR nurses and 75% head OR nurses also agreed with the assertion that the questionnaire determines the educational needs. Similar results were obtained when asking whether the questionnaire helped to identify their strengths (58% agree) and weaknesses (55% agree) in relation to their profession.

Graph 1 shows the relative frequency of answers to the first question on the user-friendliness of the questionnaires.



Graph 1 The questionnaire is easy to complete (Belgium, Finland, Greece, Czech Republic)

Source: Authors' own conception



Graph 2 The questionnaire covers all facets of my global activities (Belgium, Finland, Greece, Czech Republic)

Source: Authors' own conception

During the focus groups, there were a lot of discussions about the tool's applicability, the level of OR nurses' competencies, assessment of ORN skills and learning attitude. This tool can make nurses aware of their actual level of competence ("a wake-up call") and to seek how to improve them. Trough exchanges of views the head nurses establish professional objectives to develop ORN skills.

Limits

Research and data collection took place in several EU Member States with different systems of education of perioperative nurses and different competencies within their field. The range of questions in the skills/knowledge questionnaire for beginning perioperative nurses as well as nurses with more than 2 years of experience seemed too extensive at the beginning of data collection. However, in the follow-up evaluation, it embraced all areas of activity of perioperative nurses. This fact was confirmed by the result concerning the user-friendliness of the questionnaires (see graphs 1, 2), which were filled in both by perioperative

nurses and managers/trainers. Due to the different scope of the research and data collection, no data has been provided by France, the main researcher.

Conclusion

The partners of Erasmus+ KSMOR project with a help of OR professionals produced an electronic tool to serve OR nurses and head nurses to evaluate the professional skills of OR personnel. It is accompanied by a computer application KSMOR, which is its essential complement. Several EU countries have no mandatory specialized training for OR nurses. Therefore, this e-tool enables nurses to master relevant procedures in their first two years. Moreover, the e-tool facilitates formal integration, regular professional evaluation of employees, and planning of continual training. The e-tool is available for partners of the project for free for the period of three years. The countries not participating in the project can obtain the access to the e-tool after payment of a fee.

The Erasmus+ KSMOR project showed the importance of perioperative nurses education and evaluation of their skills. The discussion about the definition of "optimal level" of OR nurses skills must continue in all the countries with the aim to increase the level of perioperative nursing care. The project highlighted a need for assessment of skills and knowledge and an efficient discussion between nurses and OR managers.

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