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DEVELOPING STANDARDS AND MODELS OF COMPETENCIES FOR MEDICAL STAFF

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Abstract

Currently, the field of medicine as the most demanded industry in the world is constantly developing and improving processes, not only related to treatment methods, but also to the labour functions of medical staff. The effectiveness of methods focused on continuous improvement of production and labour processes, largely depends on the ability to introduce standards in the professional activities of workers. In accordance with the principles of lean production, standards should be formed together with the staff for whom this standard is being developed. The relevance of the research presented in the article is that for many medical organizations the introduction of standards on the principles of a "lean clinic" is the first experience. Among the key tasks, it is worth highlighting the development of not only standards, but also models of competencies of medical employees interconnected with them, as well as their introduction into the practice of medical staff in the most effective way. The article addresses main stages of the standards development process on the example of a medical organization and relationship standards with the employees' competencies. As a result of the successive implementation of the stages, standard operating cards are generated, aimed at reducing the unproductive labour costs of medical workers. Also, standard operating cards allow developing appropriate cards of competences for employees that reflect modern qualification requirements in the context of digitalization of the healthcare sector.

Keywords: Card of competences, lean clinic, lean production, standardization of medical work, standard operating cards.

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1. Introduction

The difficult epidemiological situation that humanity has faced today determined not only the high demand for medical labour, but also special attention to the problems of the healthcare sector as a whole. The standardization of medical labour contributes to the unification of the methods of professional activity of medical professionals around the world, allowing them to work according to a single model, without unnecessary losses and with the greatest efficiency.

Labour standardization is defined as the activity to develop binding standards for the implementation of improved processes, carried out in the organization, aimed at the maximum streamlining of the actions of employees at their workplaces, observing the necessary level of safety and comfort of work in order to obtain a product/service of good quality (Kasiri et al., 2017; Woomek & Jones, 2012). Lean production in any organization and field of activity involves the development of standards – standard operating cards (SOC) – a step-by-step description of the sequence of operations visualized in a single sheet format, including safety requirements for the operation, timing operations and employee movement patterns (Rother & John, 2005; Vyalov, 2015). It usually consists of text, diagrams, drawings and photographs that facilitate visual perception of the procedure (Ministry of Health and Social Development, 2006).

The objects for the development of SOC are processes and operations (Uspenskaya & Manukhina, 2014). The main requirements for the working standard: brevity, using of visualization tools (photographs, sketches), reflection of the sequence of elements and requirements for the safe production of work (Liker, 2012).

2. Problem Statement

Large-scale developments in the field of standardization in health care in Russia have begun since the issuance of Order №277 of the Ministry of Health of the Russian Federation of 16 October 1992. According to this document, the medical standard is a system of knowledge, skills, and conditions that determine the ability to perform a certain type of medical activity. The main objectives of the standards in medicine are: ensuring the quality of medical care, reducing duplication of work, reducing the duration of treatment, ensuring the safety of patients, protecting medical workers from unreasonable complaints, and assessing the necessary resources (Lindenbraten & Ulumbekova, 2014).

Standards establish the optimal degree of streamlining of actions in most areas of the clinical practice of preventive work (De Regge et al., 2019; Hou et al., 2017; Reinke et al., 2018). In the field of medical services production, standardization ensures maximum benefits at minimum costs, serves the interests of both consumers and manufacturers. As a result of standardization of medical services is achieved:

- marginal savings of financial, labour and material resources in the production of a particular medical service;
- protection of consumer interests on the basis of stable provision of the required level of services, protection of public health;
- creation of normative documentation (Belostotsky, 2011).

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In addition, in our opinion, standards can be used as the basis for compiling cards of competences for employees (Zaika, 2012) of medical organizations.

3. Research Questions

In the conditions of constant changes and digitalization of society, a new strategy for training and retraining of staff becomes urgent: the formation of a professionally competent specialist who is able to solve problems in the development of the industry based on the principles of cooperation, science, rational using of available resources, technical improvement (improvement in the field of computer technology), development and realization of their own potential (Gnatyshina & Salamatov, 2017; Vasilieva, 2011). The constant accumulation of special knowledge and skills is the professional duty of every medical employee. The presence of the competencies models based on work standards makes it possible to assess the level of professional knowledge and skills of each health worker.

A special role today is given to the digital competencies of medical staff (Kislyakov, 2017). According to the Palumbo analytical agency Frost & Sullivan, the market for digital medical solutions in 2021 will be $ 6 billion with an annual growth of 40%. This means that in developed countries will be used on a larger scale electronic medical cards, the possibility to remotely manage patients and the ability of selling medicines and drugs online in the Internet. Using of electronic medical cards, which are actively used in countries such as Austria, France, Japan, Finland, made possible to store information about the patient, keep a complete medical history, save data on prescriptions and medicines, organize and analyse the available information in electronic form (Eichler et al., 2019; Nakagawa & Kume, 2017; Palumbo, 2017; Zardini et al., 2016).

Russian medical institutions are at the stage of transition to electronic medical cards: programs for working with electronic cards have already been installed in Russian hospitals, but paperwork is still present. In the future, the transition to electronic document management of all medical institutions will be completed, respectively, there is a need for constant training of medical employees in new digital technologies, and digital processes should be involved in the standards of their work.

4. Purpose of the Study

Standardized work, as a tool for analysis and identification of losses during an operation/process, is an accurate description of each action, the sequence of performing certain elements, the minimum number of stocks to perform work (Woomek & Jones, 2012). The need to introduce standardization of work is due to the fact that hospitals in the Russian Federation are implementing on the national project "Health Care", as well as the federal and regional projects "Development of the Primary Health Care System". In accordance with these projects, the improvement process includes standardization of the work of medical staff. In order to prepare for the development of standards in the medical institution, a sequence of actions has been formed, which includes the following steps:

- timing (photograph) of the work process;
- meeting of key employees to discuss the action plan;

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- approval of the action plan;
- Gantt charting;
- implementation of improvements;
- repeated timing;
- development of a standard operating card.

Before making a standard operational card of the process, it is necessary to find out if there are problem areas in this process and whether it is possible to eliminate them or improve the process. The search of problems takes place in order to ensure that the standard records the best sample (experience) obtained by performing any work using techniques that are most effective in terms of reducing losses, convenience and speed of its execution.

5. Research Methods

The research presented in the article was conducted on the basis of the city clinical hospital in Yekaterinburg, one of the largest multidisciplinary medical institutions in the city, which has 32 departments in three clinical services: therapeutic, surgical and obstetric-gynaecological. The total number of hospital staff is 476 people.

At the first stage, we carried out the monitoring of the workflow with defined time and observation boundaries. During this stage the process "Reception of the district therapist," which includes the sub-process "Actions of the medical nurse at the reception of the district therapist," was observed with 20 involved nurses of the clinic.

The next step in preparing for the development of the standard implies the inclusion in the work of an expert group consisting of key employees, department heads, and lean production experts, those people who are directly connected with the improving process. The expert group considers issues, what resources the organization has, what ways to improve the current state are. An action plan with indicating the dates of action's implementation is drawn, and a Gantt chart is drawn up as an illustration of the plan and the schedule of activity for the project are based on the results of the expert group work. The stage of implementation of the best experience is carried out within 2-3 months. Further, re-timing is conducted to assess the efficiency of the work undertaken, reduce time costs, change the sequence of actions, and identify previously discovered problems. The SOC for this process is compiled and based on the results of achieving a positive result.

The SOC are located at employees' workplaces; standards are reviewed annually. Obsolete standards are updated; there is a continuous improvement of the processes, and, accordingly, the standards that are attached to them. The SOC is approved by the heads of departments, and hospital's chief physician.

Based on the developed SOC and the job description, we compiled a competency profile of a nurse. In order to test the proposed models of the nurse competencies, as well as to evaluate their competency level, the assessment of 20 nurses was conducted. To this end, we elaborated a test that was supplemented by senior nurses, and approved by the deputy head of the medical organization for outpatient services. The test questions are related to the assessment of the ability to work with medical

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documents, knowledge of nursing, the basics of medical insurance, safety and industrial hygiene. Observation was chosen as an additional method of evaluation.

6. Findings

The results of the workflow monitoring are entered in a table showing performed actions, the time spent on each action and, if necessary, the distance that the employee needs to travel during the analysis process. Timing is carried out several times (7 observations) to find out whether the employee works according to a certain algorithm or whether all his actions are chaotic. The example of two timing results is shown in Table 1.

Table 01. Results of monitoring the process "Actions of the medical nurse at the reception of the district therapist" (example)

№	Process description (timing №1)	Time, sec.	Process description (timing №2)	Time, sec.
1	Patient's entrance	-	Patient's entrance	-
2	Search of the card of the patient	21	Search of the card of the patient	14
3	Search of analyses of the patient	42	Print out a new card cover	16
4	Verification of the policy	51	Check on the computer: the patient’s dispensary data	31
5	Working with a computer: Entering dispensary data	202	Exit from the room to the head of the direction	94
6	Filling in the patient 's consent, printing it out	73	Find a card for request	146
7	Design of patient’s medical card: results lining	47	Print out directions for analyses	40
8	End of admission, waiting for patient exit	30	Transfer directions for analyses to a doctor	40
9	Patient's exit	-	Patient's exit	-
	Total:	466		381

As a result of timing, it becomes apparent that the actions of the medical nurse are not carried out according to a single algorithm; she performs different actions during the reception of patients, which, in fact, should be almost identical. The time that a patient spends on a doctor’s appointment is spent on organizational formalities. For example, it is possible to prepare patient medical cards, enter test results, and print treatment consents in advance. Thus, the patient’s reception time and, accordingly, his waiting time in the queue, which without the introduction of standards is on average 20-30 minutes, will be reduced. Reducing the patient's waiting time to 13 minutes is due to the fact that the actions of the staff inside the doctor’s office are standardized, carried out in a certain sequence and a fixed time is spent on them.

The combination of models of the five key competencies of nurses forms the profile of competencies required for this medical position (Table 2).

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Table 02. Competency profile of a nurse based on the standard operating card

Competences	Level	Characteristic of competence
Knowledge of the basics of nursing	Low	Employee does not work on SOC, misses some actions
	Middle	Employee works on SOC, but does not follow the sequence of actions
	High	Employee works clearly on SOC, and always follows the sequence of actions
Ability to work with medical documentation	Low	Employee does not work with test results documentation and patient medical cards, and does not know the list of medical documentation that needs to be prepared before appointment
	Middle	Employee works with test results documentation and patient medical cards, and knows not all the list of medical documentation that needs to be prepared before appointment
	High	Employee always works with test results documentation and patient medical cards, prepare it in advance, and knows all the list of medical documentation that needs to be prepared before appointment
Computer literacy	Low	Employee does not know how to use special computer medical program, and spends a lot of time on searching for the necessary information and printing documentation
	Middle	Employee knows how to use special computer medical program on basic level, and spends a lot of time on searching for the necessary information and printing documentation
	High	Employee knows well how to use special computer medical program, quickly finds the necessary information, prints out the documentation, and technically performs operations on the PC.
Knowledge of safety and industrial sanitation	Low	Employee does not carry out processing and cleaning of workplace, and does not know what to do with class “B” waste bags
	Middle	Employee cleans workplace, and knows not all actions, that need to be taken with class “B” waste bags
	High	Employee always cleans workplace, and knows all actions, that need to be taken with class “B” waste bags
Knowledge of the basics of health insurance	Low	Employee does not work with the medical insurance policy of the patient, does not check the accuracy of the patient’s personal data, and does not know medical insurance companies operating in the region
	Middle	Employee works with the medical insurance policy of the patient, but often does not check the accuracy of the patient’s personal data. Employee knows medical insurance companies operating in the Sverdlovsk region
	High	Employee works with the medical insurance policy of the patient, always check the accuracy of the patient’s personal data. Employee knows medical insurance companies operating in the region, can advise the patient on compulsory health insurance

In order to assess the competency level of nurses, we used a test for SOC. As a result, we have identified at what level the competencies of each of the nurse are, as well as the aggregate result of all evaluated (Figure 01).

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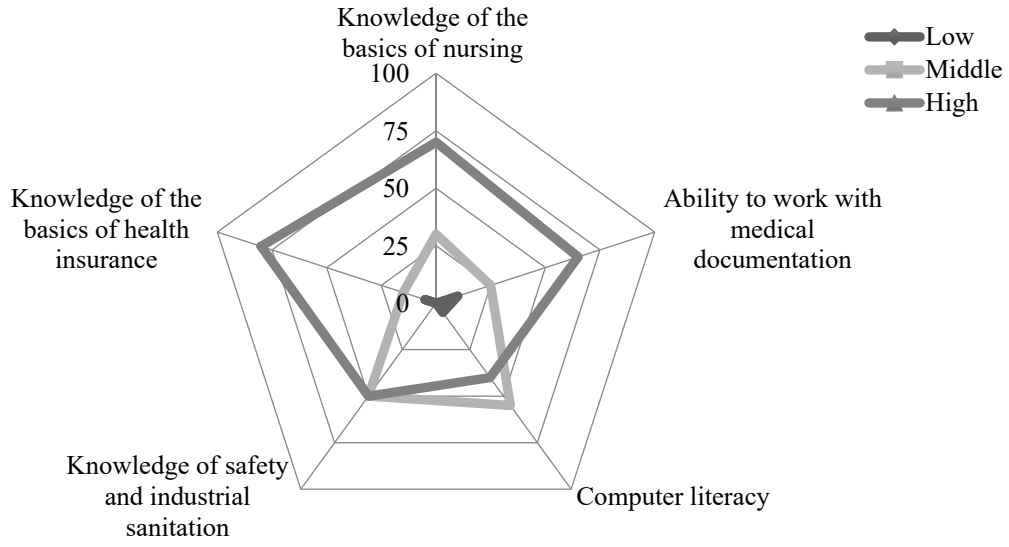

Figure 01. The aggregate result of evaluated competency level of nurses, %

It should be marked, that 7 (35%) employees showed a high level of possession of all competences. 2 employees (10%) have worse competency assessment results than all others (the level of all competencies is not higher than the second, middle level). Best of all, employees have developed the competencies of the "knowledge of the basics of nursing" and "knowledge of the basics of health insurance". At the average level, the majority of employees have the competencies "computer literacy" and "knowledge of safety and industrial sanitation". These competencies should be given the most attention while working with employees. With the rapidly growing pace of digitalization in the healthcare sector, special attention must be paid to the computer literacy of medical professionals.

7. Conclusion

Modern medicine is one of the key areas of using digital technologies. Informatization simplifies and optimizes the management of hospitals without the use of unnecessary papers and resources, helps to form human resource management, manage finances, material resources. At the federal level, a series of new decrees on electronic document management in healthcare sector are gradually being issued. The Russian Ministry of Health also plans to limit the number of medical information systems in order to reduce everything to a single standard. It will help raise the level of healthcare to a new level: the amount of paperwork will decrease; it will be possible to operate with big data and receive consultations remotely. Employees of medical organizations will be able to carry out professional activities according to single standards, which help to improve the quality of medical services.

Already at the stage of implementation of professional standards, losses are revealed in the analysed process and ways to reduce unproductive labour costs. The standardization of labour of medical staff unifies work processes, the best experience of an employee's professional activity, obtained by performing the most effective working methods, and is recorded. Since competence can be interpreted as the quality of a person that determines the best performance of certain work/actions, the relationship between standards and competencies is obvious: as discussed in the present study, standard operating

cards can serve as the basis for compiling cards of competences for employees of medical organizations. The availability of such cards allows solving the issues of the level of professional development of the medical staff, depending on the specific competence identified during the assessment of the level of ownership of employee.

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References

Belostotsky, A. V. (2011). The main directions of providing the population with high-tech medical care. *Problems of social hygiene, health care and the history of medicine, 2*, 25-27.

De Regge, M., Gemmel, P., & Meijboom, B. (2019). How operations matters in healthcare standardization. *International Journal of Operations & Production Management*, *39*(9/10), 1144–1165. https://doi.org/10.1108/IJOPM-03-2019-0227

Eichler, H. -G., Bloechl-Daum, B., Broich, K., Kyrle, P. A., Oderkirk, J., Rasi, G., Ivo, R. S., Schuurman, A., Senderovitz, T., Slawomirski, L., Wenzl, M., & Paris, V. (2019). Data Rich, Information Poor: Can We Use Electronic Health Records to Create a Learning Healthcare System for Pharmaceuticals? *Clinical Pharmacology and Therapeutics*, *105*(4), 912–922.

Gnatyshina, E. V., & Salamatov, A. A. (2017). Digitalization and formation of digital culture. *Bulletin of the Chelyabinsk state pedagogical University, 8*, 33-35.

Hou, F., Cao, L. -L., Zeng, Y., & Cheng, Y. -H. (2017). Healthcare Service Standardization in U.S. and European Countries. *3rd Annual International Conference on Management, Economics and Social Development (ICMESD 17). Advances in Economics, Business and Management Research, 21,* 370–372. https://doi.org/10.2991/icmesd-17.2017.69

Kasiri, L. A., Guan Cheng, K. T., Sambasivan, M., & Sidin, S. M. (2017). Integration of standardization and customization: Impact on service quality, customer satisfaction, and loyalty. *Journal of Retailing and Consumer Services, 35*, 91–97. https://doi.org/10.1016/j.jretconser.2016.11.007

Kislyakov, E. (2017, December, 13). Digital technology dictates the rules of the game in the labour market. *Russian newspaper*. https://ac.gov.ru/comments/comment/15512#

Liker, J. (2012). *Toyota Tao: 14 management principles of a leading company in the world* (7th ed.) Alpina Publisher.

Lindenbraten, A. L., & Ulumbekova, G. E. (2014). Standardization and quality management of medical care. In V. I. Starodubov (Ed.), *Public Health and Healthcare: A National Guide* (pp. 452-467). GEOTAR-Media.

Ministry of Health and Social Development of the Russian Federation (2006). On approval of the administrative regulations of the Federal Service for Supervision of Health and Social Development for the performance of the state function to monitor compliance with health care quality standards. https://www.garant.ru/products/ipo/prime/doc/12052359/

Nakagawa, S., & Kume, N. (2017). Pharmacy Practice in Japan. *Canadian Journal of Hospital Pharmacy*, *70*(3), 232-242.

Palumbo, R. (2017). Examining the impacts of health literacy on healthcare costs. An evidence synthesis. *Health Services Management Research, 30*(4), 197–212

Reinke, L. F., Hendricksen, M., & Lynn, J. (2018). Care Plan Standardization for Older Adults: Opportunities for Nursing Leadership. *Journal of Gerontological Nursing, 44*(12), 11–16. https://doi.org/10.3928/00989134-20181109-02

Rother, M., & John, S. (2005). *Learn to see business processes. The practice of building value creation maps.* Alpina Business Books: CBSD, Centre for the Development of Business Skills.

Uspenskaya, I. V., & Manukhina, E. V. (2014). Scientific and organizational aspects of improving specialized medical care in the context of modernization of regional health care. *Journal of Grodno State Medical University, 4*, 95-97.

Vasilieva, L. A. (2011). Features of the formation of professional competence of medical workers. *VESTNIK of OGU, 5*(124), 19-21.

Vyalov, A. V. (2015). *Lean production: a training manual*. FGBOY VPO KnAGTU.

Woomek, J., & Jones, D. (2012). *Lean production: How to get rid of losses and achieve the prosperity of your company* (12th ed.). Alpina Publisher.

Zaika, M. M. (2012). *Assessing the level of development of staff competencies in the corporate knowledge management system* (Doctoral dissertation). Siberian Academy finance and banking.

Zardini, A., Rossignoli, C., & Campedelli, B. (2016). The impact of the implementation of the electronic medical record in an Italian university hospital. In C. Rossignoli, M., Gatti, & R. Agrifoglio (Eds.), *Organizational innovation and change. Lecture Notes in Information Systems and Organisation, vol.13* (pp. 63-73). Springer. https://doi.org/10.1007/978-3-319-22921-8_6