

REVIEW

by Assoc. Valya Ivanova Dimitrova, Ph.D.,

Faculty of Public Health, Department of Health Care at MU - Varna,

member of the scientific jury according to the order № R-109-548 of 06.12.2023 of the Rector of MU - Varna, and on the basis of Protocol № 1 of 13.12.2023 from the first meeting of the Scientific Jury I am appointed to prepare a review in the procedure for obtaining the PhD in the field of higher education 7. Health and Sport, professional field 7.4 Public Health, scientific specialty Health Care Management, with candidate

INNA STOYNOVA NENOVA,

with a dissertation on "*Electronic system for management of obstetric care outside of hospital facilities.*" with scientific supervisors prof. Silviya Borisova Dimitrova, Ph.D, DSc. and Assoc. Eng. Prof. Margreta Parashkevanova Vassileva, Ph.D,

Details of the procedure

The procedure for the development and presentation of the dissertation and the training in the doctoral programme fully complies with the regulations.

By the Order of the Rector of MU-Varna R-109-485 of 04.11.2020 Inna Stoyanova Nenova was enrolled as a PhD student in the full-time form of study for the award of PhD in the field of higher education 7. Health and Sport, professional field 7.4 Public Health, in the scientific specialty Health Care Management. The following documents have been submitted: Protocol of successful completion of the PhD examination of 29.04.2022, pursuant to Order R-109-171 of 15.04.2022 of the Rector of MU - Varna and Protocol of successful completion of the foreign language examination of 17.12.2021, pursuant to Order R-100-642 of 21.09.2021 of the Rector of MU - Varna.

In view of the report No. 102-2803 of 15.11.2023 of Assoc. Katya Genova Eguruze, Ph.D. - No. 104-1391/27.11.2023 of prof. Antonia Slavcheva Dimova - Yordanova - Dean of the Faculty of Public Health and on the basis of Art. 24, par. 6 and Art. 30, par. 68, par. 1 of the PRAS of MU - Varna by Order of the Rector of MU - Varna No. R-109-548 of 06.12.2023. Inna Stoyanova Nenova was dismissed with the right to defence.

The entire package of administrative documents provided for in the Academic Staff Development Act and the Regulations for the Development of Academic Staff of MU-Varna has been submitted.

Biographical data and career development of the PhD student

Inna Stoyanova Nenova was born in 1992 in Varna. She obtained her medical degree in midwifery with a bachelor's degree at the Medical University - Varna in 2015. In the period 2017 - 2019 she studied and successfully completed the Master's programs of MU-Varna in Health Management and Health Care Management. Immediately after her graduation, in 2015, she worked at "AMCSP St Anthony" Ltd. as a medical registrar. Between 2015 and 2020, she worked as midwife at Chaika Medical Center Ltd. and from 2017 -2018, she was the Office Manager at Medical center Prof. Dr. Stamatov. Since 2019 she has been appointed as a midwife and since 2021 she holds the position of Chief Midwife at Medical Center "Prof. Dr. Stamatov". As a full-time PhD student at the Department of Health Care, in the academic year 2022/2023 she conducts exercises of students from the "Midwife" magazine in the discipline "Nursing care of pregnant women with normal and pathological pregnancy". Inna Nenova's research interests, as evident from the publications presented and participation in postgraduate training courses, are focused on the medical, psychological, social and ethical aspects of the care of pregnant and puerperium women and the possibilities of autonomous midwifery practices to meet the needs of women for midwifery care in relation to pregnancy and childbirth. The candidate, Inna Nenova, has a good command of English. She is a member of the Bulgarian Association of Health Care Professionals and is a member of the Board of the Regional Collegium of Health Care Professionals in Bulgaria. Varna to the Bulgarian Association of Health Care Professionals.

General characteristics of the dissertation work

The dissertation work presented by Inna Nenova was developed at the Department of Health Care at Medical University - Varna. The dissertation spread across 208 pages, is presented in 5 chapters and includes: introduction (2 pages), literature review (41 pages), methodology and organization of the research (11 pages), results and discussion (26 pages), practical application (42 pages), conclusions, arguments and contributions (4 pages). References used and eight appendices are also presented. The text is illustrated with 66 figures, 27 tables and 8 appendices. The bibliographical list includes 181 references, of which 77 in Cyrillic, 67 in Latin and 37 Internet sources.

Relevance of the thesis

Midwifery is perceived as a major part of modern medicine, providing care for women at every stage of their lives, in line with their specific needs. The midwife is the health professional who traditionally provides care and counseling to women and families on issues related to pregnancy, childbirth, breastfeeding, child development, contraception and family planning. Over the centuries, the role of the midwife has changed, from an independent but uneducated professional to a highly educated professional wholly subordinate to the doctor, to a health care professional who works alone or in teams with doctors and other professionals and can open and run an independent practice. At the same time, we are witnessing the increasing application of computer technology in the diagnostic and treatment process. In developed countries, electronic records are common practice with multiple uses and effects both in terms of planning and applying care algorithms and resources, solving specific cases, tracking of processes and outcomes, and in building multidisciplinary teams and documenting information. Significant effects of electronic records are also reducing the risk of omissions and errors and ensuring continuity of care.

The significance of the problem, the challenges in contemporary midwifery practice and the opportunities for implementing an electronic midwifery record challenged the research interest of the team and provided the rationale for the development of this thesis.

Evaluation of the structural parts of the dissertation

The literature review systematized and analyzed 181 literature sources, of which 77 in Cyrillic, 67 in Latin and 37 internet sources. The literature is contemporary, with 72% of the literature sources from the last 20 years. Almost half of the literature sources are from the last 10 years (43%). The literature review is structured in four distinct parts, where in a logical sequence the PhD student presents the development of midwifery care from antiquity to the present day, independent midwifery care - experiences and practices, specific nursing documentation, digitalization of nursing documentation, electronic midwifery record in Bulgaria, possibilities for integration of electronic midwifery record in medical software and electronic record as a tool of telemedicine. In the first part, the PhD student discusses the historical development of the midwifery profession, focusing on important facts that gave impetus to the formation of the image of the modern midwife. A special place in the historical overview is occupied by the development of the profession in Bulgaria. A detailed analysis of the medical documentation accompanying the monitoring of pregnancy and the postpartum period is also made, highlighting important issues in the coverage of midwifery care in these periods. The second part presents different models for the provision of obstetric care in relation to pregnancy and childbirth, highlighting their advantages and disadvantages. Particular attention is given to the role and functions of the midwife in counseling pregnant women in the country, highlighting the dominance of administrative work and the lack of opportunities for independent contact with women during which health care professionals can carry out their traditional roles of psycho-prophylactics and education. The third part presents the nursing process and nursing diagnosis that underpin the concept of modern nursing. The author emphasizes that the application of the nursing process guides the care and organizes the activities carried out by the midwife in each area of her professional activity. The end of the literature review is devoted to the benefits of digitizing patient records and moving from paper-based documentation to one in electronic format to improve communication, reduce errors, and ensure continuity of care. The author also presents a SWOT analysis of the concept of telemedicine in Bulgaria with its additions.

Aim, objectives and working hypotheses

The aim of this study is to investigate and optimize the management of obstetric care by developing a methodology to integrate an electronic obstetric record in outpatient care.

In order to achieve the objective, seven **tasks** were derived which are: To investigate the development of midwifery care for the pregnant woman, the parturient and the newborn child, to investigate Bulgarian and foreign experiences of the implementation of specific nursing/midwifery documentation in the performance of independent midwifery care, to identify best practices for planning nursing/midwifery care, to investigate the opinion of experts, health care educators and midwives, on the need to introduce an electronic midwifery care record, to undertake a theoretical analysis of the documentation associated with recording independent midwifery activities and care, to establish the feasibility of integrating an electronic midwifery care record into current medical

software, to develop and propose a methodology for establishing an electronic midwifery care management system in outpatient care.

Four **working hypotheses** relevant to the aim and objectives of the research are defined.

Methodology

The methodology of the research is described in detail and correctly as the subject of the study is defined as specific obstetric documentation in planning, organizing and conducting activities in obstetric practice. The **якфтеъня** of the study were identified as normative documents regulating the professional activities of the midwife, literature/electronic sources concerning best practices in organizing and providing nursing and midwifery activities and care, practical activities of the midwife in providing self-care, database management systems, midwives working in outpatient care facilities in the field of midwifery care (30), health care educators from higher education institutions in the country who are involved in the teaching process on theoretical and practical bases of nursing and midwifery care (20), experts from the structures of the Bulgarian healthcare association, with competence and specialized knowledge in the field of midwives activities and care (10).

The research design provides a theoretical and empirical study. The theoretical one implies the study of the organization of midwifery practices in the follow-up of pregnancy, the condition of the mother and the care of the newborn child by analyzing the content and nature of the midwife's autonomous activities, the study of the available specific midwifery documentation used by medical professionals in planning and providing care through content analysis (quantitative analysis) of documentation and the study of database management systems through a method of defining data structures. The empirical study involved a qualitative survey of midwifery-qualified health professionals and experts in midwifery activities and care, on the management of midwifery care in outpatient settings through an in-depth interview. The study included 30 respondents from outpatient care facilities where assessment and care of pregnant women, women in labor and newborns is provided from the cities of Varna, Veliko Tarnovo and Shumen. The participants in the in-depth interview included 10 experts, proven professionals in the field of obstetric care and researchers in the field of modern nursing from the cities of Sofia, Varna, Pleven, Ruse and Veliko Tarnovo. For the purpose of the study, Questionnaire No. 1 and Questionnaire No. 2 were developed to conduct an in-depth interview, formulating two main research questions related to the subject of the study. The empirical study also includes a quantitative survey among faculty members in the field of health care regarding the competencies of applying the nursing process and working with electronic-based information in the teaching process. The quantitative methods include conducting a survey (questionnaire with 15 questions), among academic lecturers of the Medical University "Prof. D-r Paraskev Stoyanov - Varna, Medical Universities in Pleven and Plovdiv, University "Angel Kanchev" - Ruse and Thracian University - Stara Zagora. Inclusion and exclusion criteria, logical units and study area are correctly defined and described.

The study was conducted after approval by the Research Ethics Committee at the Medical University - Varna with Protocol No. 121 dated 06.10.2022.

The methodology of the study, defined by the PhD student and the supervisors, is well detailed, correctly described and allows achieving the set goal and objectives. The research methods are precise and statistically validated. The thorough and multifaceted nature of the study is further enhanced by the adequate instrumentation that has been used, which improves the quality of the dissertation presented and its contributions. In the described methodology, sociological methods - documentary, in-depth interview, standardized interview, SWOT analysis method, relational model for database management system selection - stand out. Multiple statistical methods are used, namely statistical grouping of data, descriptive (descriptive) methods, frequency analysis of qualitative variables, correlation analysis, comparative analysis.

Results and discussion

The presentation of **chapter three** begins with a characterisation of the study population, where it is striking to note that, at present, there are no statistics on the number of midwives practicing in outpatient care in the country. The average age of the respondents was 43.9 years (n=60). The presentation of the own results continues with an exploration of attitudes towards the introduction of an electronic midwifery record against the background of a lack of uniform medical documentation concerning the activities of health care professionals. The majority of those surveyed expressed positive attitudes towards the introduction of an electronic obstetric record (66%), indicating a clear need for a system for electronic entry and collection of obstetric information. The quoted opinion of the respondents subject to the conducted survey converges around the view of the clear benefits and appropriateness of introducing an electronic obstetric record. The possibility of the electronic midwifery record being based on a nursing care plan, which would ensure a personalized approach, continuity of care, was discussed, supported almost unanimously by the experts (90%). The components of the electronic midwifery record were identified based on the respondents' views. Global trends tend to support activities aimed at reducing paper-based documentation and actively transferring data electronically. This is associated with a number of benefits of various kinds: it reduces the amount of paper and ink used (environmental effect), it frees up space in offices previously used for archives, and it avoids the problem of difficult-to-read handwriting, which in turn is a prerequisite for unintentional errors, respectively reducing quality. Full use of medical software requires some computer knowledge. The opinion of faculty members regarding the students' proficiency in using medical software was investigated. More than half of the respondents believed that electronic obstetric record (EOR) should replace paper records (54%), and the skepticism of some respondents was attributed to the facilities of the offices rather than lack of skills and competence. The benefits of introducing EOR were identified in relation to facilitating access to information between the different members of the multidisciplinary team providing care to the pregnant and/or gynaecologically ill woman, and the potential for its use as a tool for costing obstetric labor. Chapter three concludes with a presentation of a SWOT analysis of the concept of an electronic obstetric record, where weaknesses, strengths, opportunities and threats are thoroughly reflected. Chapter four presents an Electronic Midwifery Care Management System in the form of a practical application. The presentation starts with an exploration of International and Bulgarian experiences in the implementation of an electronic patient record. According to the PhD student, developed countries are a benchmark for health care organization and impose new approaches including the creation

and implementation in practice of electronic patient records. A schematic representation of the International Patient Summary Structure adapted by the author is presented. The author highlights that the development of the module has made use of “БАПИЗГ” developments, documentation developed in consultation with a medical law solicitor and used within an independent obstetric practice, WHO checklists and sample documents by various Bulgarian authors. The Electronic Obstetric Record developed by the PhD student is presented in detail with a detailed description of the functionalities of the individual modules and the possibilities for variations of the information submitted. The developed design of the Electronic Obstetric Record is the basis for the creation of a real application to the current medical software.

Conclusions and recommendations

Chapter five of the thesis presents conclusions, suggestions and contributions. On the basis of the conducted research nine conclusions are formulated, presenting the established regularities. The conclusions drawn correctly follow the set objectives and highlight the need to optimize the management of obstetric care by developing a methodology for integrating an electronic obstetric record in outpatient care.

The thesis formulates recommendations and proposals to the Ministry of Health, National Health Information System, Bulgarian Association of Health Care Professionals and educational institutions that would be valuable in methodological aspect for the validation of the Medical Standard "Health Care", upgrading of the Maternal Health Care Program and creation of conditions for access and exchange of data by multidisciplinary teams of health care professionals.

Evaluation of contributions

The dissertation represents a first of its kind focused and in-depth, comprehensive study to identify international experience and normative documents concerning specific for obstetric care in outpatient care documentation and the possibility of its introduction in our country in the form of an electronic record. The evolution of the nursing plan is traced and new classifications and recommendations for nursing diagnosis are presented. Best practices in unifying nursing documentation included in the electronic midwifery record are analyzed, and a SWOT analysis of the electronic midwifery record concept is presented. Among the practical contributions, the developed software product "Electronic Obstetric Record" stands out, which can be the basis for the inclusion of a component with the same name to the actual medical software.

The report comprehensively reproduces the most significant points of the thesis and is presented in a volume of 100 pages.

In connection with the dissertation, the PhD student presents **four full-text publications** in Bulgaria. I recommend Inna Nenova, together with her supervisors, to develop greater publication activity in specialized scientific journals in Bulgaria and abroad, in order to make the author's view on the possibilities of optimizing the management of obstetric care, through the integration of an electronic obstetric record in outpatient care, known to a wider range of specialists and experts in the field of health care. Through the developed dissertation, which is sufficient in volume and can be considered as an up-to-date scientific work with important theoretical and practical

contributions, Inna Stoyanova Nenova fully meets the requirements established by MU Varna for the award of the educational and scientific degree "Doctor", I have no critical comments to the dissertation.

Personal impressions


I have known Inna Nenova since the period of her training as a midwife as a conscientious, responsible and disciplined student. Even then her interest in scientific work and search for opportunities to improve health care became evident. As a student, Inna Nenova had more than 10 publications in collections and participation in student scientific forums under the guidance of faculty members from the specialty. She has transferred this proactivity to her practice of the profession, which is evident from her participation in the established independent midwifery practice at the Tchaika Medical Center and her numerous publications, participation in scientific forums and forms of postgraduate education. During her PhD studies, Inna Nenova conducted the exercises of students in the discipline "Special Care of Pregnant Women with Normal and Pathological Pregnancy" and "Clinical Practice" of students of the specialty "Midwife" and "Nurse". Outspoken in nature, consistent in her actions and inquisitive, she established herself as a respected teacher and colleague. I believe that the practical and teaching experience gained is the basis for a realistic assessment of existing midwifery practice as a starting point for introducing innovations with multiple effects, both to improve the quality of midwifery care in outpatient settings and in terms of the satisfaction of health care professionals.

Conclusion. On the basis of professional development, scientific and teaching achievements and in compliance with the criteria of the Academic Staff Development Act in the Republic of Bulgaria, its Regulations and the Regulations for the Development of Academic Staff at MU "Prof. Dr. Stoyanov" - Varna, I give my **positive vote** and confidently propose to the esteemed Scientific Jury that the PhD student *Inna Stoyanova Nenova* acquire the degree of Doctor of Science in the scientific specialty "Health Care Management".

15.01.2024 г.

Prepared the review:

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Assoc. Prof. Valya Dimitrova, Ph.D.