

**UNIVERSITY OF MEDICINE AND PHARMACY  
“CAROL DAVILA” BUCHAREST  
DOCTORAL SCHOOL**

**FIELD OF STUDY: MEDICINE**



**PhD THESIS**

**THESIS ABSTRACT**

**PhD supervisor:**

**PROF. UNIV. DR. BRĂȚILĂ ELVIRA**

**Doctoral student:**

**DUMITRACHE (STAN) DANIELA**

**2024**

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**ASSESSMENT OF THE CARE PROCESS  
PROVIDED BY MIDWIVES AND NURSES TO  
WOMENS WITH PATHOLOGIES ASSOCIATED  
WITH PREGNANCY AT ADVANCED AGE**

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## **THE Phd THESIS INCLUDES:**

- The general part consisting of two chapters relating to the current state of knowledge
- A chapter presenting the type of studies and research methodology
- Three research studies related to the topic of the research project
- 23 Figures
- 24 Tables
- 10 Appendices
- 1 poster published at an International Symposium on the topic of the research project
- 153 pages

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## GENERAL PART

The role of midwives and obstetrics and gynecology nurses in providing primary health care to pregnant women is considered essential, both internationally and nationally, and the quality of assessment, care and treatment is vital. These categories of staff are involved in the local community and can provide effective interventions to meet the healthcare needs of patients, families and the community [1].

In Romania, the medical care of pregnant women is carried out through interdisciplinary teams made up of obstetricians, physiotherapists, midwives, nurses, dieticians or nutritionists, and the healthcare team can be completed with other specialists depending on the particular situation of each patient.

Screening and preventive medical care are the gold standard in minimizing the impact of pathologies that can develop during pregnancy on the mother and fetus. It is essential that midwives and nurses have theoretical and practical knowledge regarding the main preventable pathologies during pregnancy in order to be able to intervene in the process of evaluation, diagnosis and management of the pregnant patient thus contributing, through the healthcare provided efficiently, to the decrease infant and maternal mortality rates [1].

Considering the national and international context of this health issue that is of interest to both the health of the mother and the child, this research project was designed with the aim of identifying and disseminating among midwives and nurses the best medical care practices for pregnant patients at extreme ages.

Within this research project, we set as our main objectives the identification of the most common conditions and complications associated with pregnancies at extreme ages (age >40 years and <18 years) and the identification of the best healthcare practices that midwives and nurses should give to patients with pregnancies at extreme ages, in order to prevent complications and reduce the negative impact of these conditions on the mother and the child.

The main research hypotheses that formed the basis of the design of this research project were:

- pregnancies at extreme ages can generate important complications for both the mother and the fetus;
- the healthcare practices given by midwives and nurses to pregnant patients are not in accordance with the best research evidence;

- the knowledge, the attitudes and the practices of midwives and nurses need to be updated in line with the best evidence of good practice.

Through the research carried out in this study, we want to identify the current level of knowledge and practices of nurses and midwives in the field of pregnant patient healthcare in order to identify and prevent the occurrence of the most common pathologies associated with pregnancies at extreme ages. Secondly, the study aims to identify the educational needs of midwives and nurses in a specialized hospital and lay the foundations for an educational program and the development of a healthcare protocol for the pregnant patient at extreme age. Assessing the level of knowledge, attitudes and practices of midwives and nurses caring for pregnant patients can generate important directions for action for nursing leadership in improving current healthcare practices. In the specialty literature there is data showing that the lack of knowledge and the lack of access to the best medical care evidence are the main causes of ineffective management of the pregnant patient in terms of identifying and preventing pathologies associated with pregnancy, while in our country studies on this topic are limited [2] .

The general part of this thesis is structured in two chapters in which aspects related to physiological changes in pregnancy, the particularities of pregnancy at extreme ages, the presentation of the main pathologies associated with pregnancy at extreme ages and statistical data on maternal mortality are addressed. In the second chapter, the main aspects related to the role of the midwife and the nurses in providing healthcare to pregnant women are presented in the legislative context of these professions at national and international level. In this chapter, the main competencies of midwives are presented in accordance with WHO recommendations.

## **THE SPECIAL PART**

### **PRESENTATION OF THE RESEARCH METHODOLOGY**

The purpose of this research project is to increase the quality of the medical act and improve the level of knowledge, attitudes and practices of midwives and nurses who care for patients with pregnancies at extreme ages during all the stages of pregnancy evolution.

The main objective of the research is the development and implementation in the midwifery medical care activity of the best practices regarding medical care of patients with

pregnancies at extreme ages, through the development of a research study carried out in several stages.

- Thus, during the research, several working hypotheses were formulated that are to be demonstrated through the studies that will be carried out as part of this research project:
- The existence of a causal link between the extreme age of pregnancy and the identified pathology;
- Controlling the risk factors of the pathology associated with extreme ages pregnancy, that can influence the health of the mother and the normal development of the child.
- Midwives have a limited level of knowledge regarding the care of patients with pregnancies at extreme ages, because at national level there is currently no healthcare protocol and training program for midwives regarding patients with pregnancies at extreme ages;
- The level of knowledge and practices improves after completing the educational program.
- In the healthcare practice of midwives and nurses who take care of patients with gestational diabetes, the care practices grounded on the best evidence of good practices are not implemented;
- The implementation of a project of best practices regarding healthcare of patients with gestational diabetes leads to an increased compliance with the best healthcare practices.

The batch of the studied population varied according to the stages of the research and the type of study as follows:

- In the first study in which the main objective was to identify the main pathologies associated with pregnancy at extreme ages, the group of the studied population was represented by a group of 186 patients hospitalized in the "Clinical Hospital of Obstetrics and Gynecology Prof. Dr. Panait Sîrbu" during 01.01.2019 - 31.01.2019. The main group of patients was divided into two groups, the group of patients aged  $\leq 19$  years (77) and the group of patients aged  $\geq 39$  years (109).
- In the second study in which the knowledge, attitudes and practices of nurses who care for parturient women in an obstetric ward were evaluated, the group of the studied population was represented by 125 midwives and nurses working in Obstetrics wards within the "Clinical Hospital of Obstetrics and Gynecology Panait Sîrbu".
- In the third study, the studied sample consisted of two groups. The first group was represented by 30 patients hospitalized in the Obstetrics and Gynecology ward 2, between April 15-25, 2021, and the second group was represented by all the midwives and nurses



who work in this ward and directly participate in the medical care of these patients. (15 midwives, 15 nurses and 12 nurses).

## **CHAPTER 4**

### **THE STUDY ON MATERNAL PATHOLOGY AT EXTREME AGE**

The purpose of the study was to identify the most common pathologies that can be developed by pregnant women at extreme ages and to identify the main complications that can occur both to the mother and to the child, with the aim of developing specific training programs for midwives and nurses and to develop healthcare protocols adapted to the identified pathologies and medical education guidelines for patients. In this research, the analysis started from the hypothesis that pregnancy at extreme ages is associated with important maternal and fetal risks.

In the prospective retrospective study, two reference groups were formed for which medical information was collected from the observation sheets. The first group was formed by all pregnant women who gave birth in the "Clinical Hospital of Obstetrics and Gynecology Prof. Dr. Panait Sîrbu" aged between 14-19 years. The second group was made up of patients older than or equal to 39 years old. The study included in the analysis 77 adolescent patients aged  $\leq 19$  years and 109 patients aged  $\geq 39$  years, hospitalized between 01.01 and 31.12.2019. The study included only patients who were admitted to the hospital for delivery, excluding patients who were admitted for other types of care.

A quantitative research method was used to collect and analyze several variables such as: patients' age, parity, gestation, the method by which the pregnancy was obtained, the type of birth, pathologies associated with the gestation period, treatments performed during pregnancy, the presence of other maternal and neonatal complications, fetal birth weight, the presence of preterm births and the APGAR score of the newborn.

The average age of the 109 patients with advanced maternal age is 41.2 years. The women's parity ranged from 1 to 6, and pregnancies were achieved naturally (62 pregnancies) and through in vitro fertilization (47 pregnancies).

In the case of pregnant patients aged between 39-50 years, 70% had one pregnancy in the past, 19.17% had 2 pregnancies in the past, 8% had 3 pregnancies in the past, 2% had 4 pregnancies, 2% presented 5 pregnancies and 1% presented 6 pregnancies.

In the case of adolescent patients, we observed that 69% presented 1 pregnancy in the medical history, 30% presented 2 pregnancies, while 1% of the total number of patients presented 3 pregnancies in the antecedents.

The comparative analysis of the data collected regarding the share of pregnant women aged 39 years and over with more than one pregnancy is significantly higher than among those with a maximum age of 19 years.

Data processing indicates that the proportion of pregnant patients at their first birth are approximately similar in the two groups, which is explained by the significantly higher frequency of lost pregnancies among the 39 years and over category.

For the maximum age category of 19 years, the pregnancy/pregnancies were fully achieved naturally, while, in the case of the 39 years and over category, almost half of them (43.1%) are the result of in vitro fertilization procedures. Information on the number of in vitro fertilizations is relatively incomplete (for 45% of patients aged 39 and over there is no information).

The analysis of data on the presence of preterm births and the presence of intrauterine fetal development restrictions included all patients with preterm birth (before 37 weeks of gestation, but over 24 weeks of gestation), with low birth weight (below 2500 grams) and intrauterine growth restriction – IUGR (diagnosed antenatally).

Both prematurity and uterine restriction of fetal development are problems generated by pregnancy at extreme ages known and demonstrated in previous research.

Regarding gestational age, preterm births (28 preterm births) ranged from 27 weeks of gestation to 36.8 weeks of gestation. Regarding the birth weight of the premature newborn, it varied from 650 grams to 3980 grams, with an average weight of 2150 grams. The type of birth includes natural birth (6%) and birth by caesarean section (caesarean section) – 94%.

In the case of our research, the proportion of premature newborns is also higher in the case of pregnancies performed at the age of at least 39 years and above, as well as that of intrauterine fetal growth restrictions.

Intrauterine fetal growth restriction is a condition that can be encountered during pregnancy, caused by multiple causes and that can represent an important cause of fetal and neonatal morbidity and mortality. It can be seen that 18.3% of patients in the group over 39 years old and 9.1% of patients with a maximum age of 18 years had intrauterine growth restrictions.

APGAR scores obtained at birth vary between 7 and 10 (for the category of patients with a maximum age of 19 years) and between 3 and 10 (for the category of patients aged 39 years and older).

Analysis of data on the APGAR score obtained by newborns from mothers with a maximum age of 19 years shows that 3.9% of newborns obtained an APGAR score of 7,

19.5% obtained an APGAR score of 8 and 76.6 % of newborns received an APGAR score of 9 and 10. The situation is slightly different in the case of patients over 39 years old, where it can be noted that only 12.8% of newborns obtained an APGAR score of 10, while 0.9% achieved an APGAR score of 3, 1.8% achieved an APGAR score of 6, 5.5% achieved an APGAR score of 7, 15.6% achieved an APGAR score of 8, and 58.7% achieved a APGAR score 9.

The comparative analysis, by age category, of the data related to the associated pathologies reveals that the prevalence of diabetes is significantly higher among pregnant women in the second age group (39 years and older).

The implementation of care protocols adapted to this health problem can help the patient to prevent the development of this disease during pregnancy by starting a healthy lifestyle in which physical effort, diet and rest schedule are the main aspects that must be taken into account .

Among patients included in the study, other complications associated with the evolution of the pregnancy were fully listed, such as: anemia, urinary tract infections with different germs (Klebsiella, Streptococcus, Candida Albicans, E. Coli, Plasma Urea, MRS, Trichomonas vaginalis), varicose veins, disease hemorrhoidal, placenta praevia, thrombocytopenia, hypothyroidism, polyhydramnios, liver cytolysis, pelvic presentation, uterine fibroid, VDRL positive, HELLP syndrome, cholestasis, thalassemia minor, macrosomic fetus, endometriosis, secondary uterine inertia.

Also, situations in which there is no other complication associated with the pregnancy are much more frequent among pregnant women aged maximum 18 (64.9%), compared to those aged 39 or more (33.9%).

Data analysis indicates the presence of fetal complications that are significantly more frequent among newborns of mothers aged  $\geq 39$  years compared to those occurring among mothers aged  $\leq 19$  years.

The most common fetal complications reported in this study were toxic erythema, neonatal jaundice, congenital hydrocele, allergic erythema, clubfoot calcaneovalgus, fetal ozoimmunization, hemangioma, unstable hip, macrosomatic fetus, congenital deformities of the lower limbs, talus valgus congenital, transient metabolic disorders, fetal asphyxia.

### **Partial conclusions**

In this cohort study, the comparative analysis of the two groups evaluated the maternal outcomes and complications associated with the patients who constituted the two studied groups. The conclusions of this research reveal the fact that patients in the age

category  $\geq 39$  years have a higher frequency of lost pregnancies and intrauterine restrictions of fetal development, this last aspect being associated, most likely, with the higher frequency of births ahead of time, in this age category. As it emerges from the results of this research, among patients in the age group  $\geq 39$  years, there is a significantly higher share of medical conditions associated with pregnancy, as well as of newborns who present at birth various pathologies such as macrosomia, fetal asphyxia and prematurity

Thus, we can conclude that the hypothesis of our study is confirmed in this research. Although pregnancy at extreme ages may be associated with significant maternal and fetal risks, advanced age cannot be considered a risk factor during pregnancy, childbirth and the postpartum period. It should be kept in mind that the negative outcomes of a pregnancy at an advanced age are not entirely due to age, but additional factors such as the mother's chronic conditions, the mother's lifestyle, parity and social environment must be taken into account, factors that may influence negatively the proper evolution of a pregnancy [4]. We believe that there is a real need for a distinct health care approach for older mothers to identify and prevent adverse events that may endanger pregnancy. Numerous studies have concluded that a pregnancy occurring at an advanced age may predispose a woman to several complications such as preeclampsia, placenta previa, gestational diabetes, premature birth or even neonatal death [5], [6-7]. The results of this study were published in the journal *Ginecologia.ro* [8-9].

## **CHAPTER 5**

### **THE STUDY ON THE ASSESSMENT OF THE KNOWLEDGE, ATTITUDES AND PRACTICES OF MIDWIVES AND OBSTETRICS NURSES REGARDING GESTATIONAL DIABETES AND PREGNANCY-INDUCED HYPERTENSION**

Through the research carried out in this study, the main objective was to identify the current level of knowledge, attitudes and practices of M and OG-Nurses in the field of pregnant patient care, with the aim of identifying and preventing the occurrence of the most common pathologies associated with pregnancies at ages extremes, hypertension and gestational diabetes. In the secondary plan, the study aims to evaluate the impact of an educational program on the level of knowledge, attitudes and practices of M and OG-Nurse working within the "Clinical Hospital of Obstetrics and Gynecology Prof. Dr. Panait Sîrbu" and to lay the foundations for the development of a healthcare protocol for pregnant women at extreme age.

The study is designed following the structure of a longitudinal study focusing on two main components: the development of an educational program addressed to midwives and

nurses adapted to the educational needs identified among M and nurses and the evaluation of the impact of the educational program on the level of knowledge, attitudes and practices of midwives and nurses who directly care for pregnant patients with HTN and GD.

The research included 5 main stages: (1) evaluation of practices, attitudes and knowledge of midwives and nurses regarding the medical care of pregnant women with GD and HTN (15.04.2020), (2) development of an educational program based on the educational needs identified following the initial evaluation (M1) (01.05-01.06.2020), (3) running the educational program on a group of 125 midwives and nurses (01.07.2020-5.07.2020), (4) evaluating the practices, attitudes and knowledge of midwives and nurses immediately after the completion of the training program (M2) (07/05/2020) and (5) reassessment of practices, attitudes and knowledge 3 months after the completion of the training program (M3) (10/01/2020).

The educational program was drafted based on the educational needs identified among M and nurses included in the study at time 1 of the evaluation. It included information on pregnancy-induced hypertension, treatment of hypertension, tests for predicting pathological increase in tension values in the last period of pregnancy, the role of the midwife and nurse in the follow-up and supervision of pregnancy-induced hypertension, HELLP syndrome, gestational diabetes and pregnancy - causes and effects on pregnancy, birth and delivery, the role of the midwife and nurse in the medical care of patients with GD during pregnancy, delivery and postpartum. To reduce the phenomenon of bias, the researchers kept the same study sample in all three study steps (M1, M2, M3).

The questionnaire was applied to a number of 125 nurses and midwives from Panait Sârbu Hospital who work in obstetrics and gynecology departments.

The sociodemographic characteristics of the respondents indicate a mean age of the midwives and nurses participating in the study of 44.7 years, with a standard deviation of 8.3. For professional experience, an average of 18.2 years was recorded, with a standard deviation of 10.3.

The assessment of healthcare practices offered by midwives and nurses to the 23 items detailed various medical care practices, highlighting a relatively increased variability in the first stage of the research. Respondents reported that they rarely or never read articles/journals/books in the two research areas before the time of training. Also, before participating in the educational program the respondents recorded average scores for the scale of practices, attitudes and knowledge. This suggests that although 60.8% of respondents reported having previously attended training sessions on topics related to the

prevention and management of HTN and GD, the level of knowledge, attitudes and practices prior to the training was at a average level, with correct answers given in percentages varying between 52.8% - 92.8%.

The evaluation of the degree of interest in reading materials on the topic of GD and HTN management indicated that slightly more than 50% of the respondents stated, before the training session, that they rarely or never read articles/journals/books in the two research areas. This situation is relatively different after completing the training, considering the fact that, immediately after the training and 3 months after its completion, only approximately 10% and 19%, respectively, stated that they rarely access information sources related to pregnancy induced arterial hypertension, while, for the same 2 moments of the post-training application of the questionnaire, in case of gestational diabetes, the percentages of those who declare that they read rarely or very rarely is around 13%.

Considering the results obtained by processing the data recorded on these 2 items, we can therefore consider that completing the training module led to an important increase in interest for this type of access to specialized knowledge, an interest that did not diminish even after 3 months after its completion.

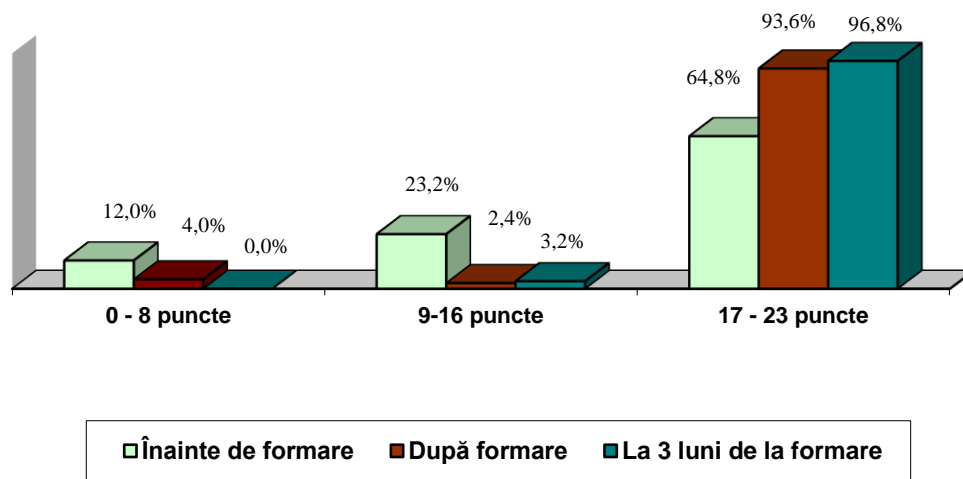
The comparative evaluation of the current practices regarding the medical care provided by M and OG nurses to patients according to current healthcare protocols indicates that in all 3 moments of the questionnaire application, the majority of respondents stated that both the protocols related to the prevention and management of gestational hypertension and those dedicated to GD are known and consistently applied by nurses and midwives, with training not having a significant impact on these aspects. The responses recorded to the 23 items detailed various healthcare practices, in all 3 stages of the research and demonstrated the significant impact of completing the training module.

During the second stage of the study, the significant impact of completing the training module can be noted: the weights of the answers that reveal the permanent use of correct practices increased significantly immediately after the training, for all items and remain significantly higher compared to the moment before the training and at 3 months after its completion, with one exception, in which the item "when measuring blood pressure, they use calibrated and well-maintained devices", for which the share of answers "always" shows a significant increase immediately after the training, but the pre-training difference - 3 months of upon formation it loses its meaning.

The score for the practices scale was calculated by summing the correct answers to the 23 questions about practices, so that the values of this score can theoretically vary between 0 and 23; for the graphic representation, the scores were divided into 3 ranges: 0-8 points (low scores), 9-16 points (medium scores) and 17-23 points (high scores).

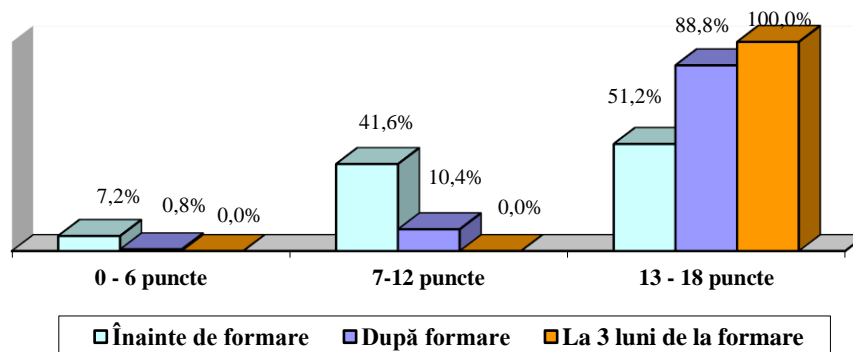
The share of respondents who obtained high scores (between 17 and 23 points) on the items that make up the practice evaluation scale increases from approximately 65% in pre-training to over 93% immediately after and over 96%, respectively, at 3 months since training, and the differences between the average scores on this scale for the 3 moments is significant.

**Figure no. 17 Practice scale scores**



Regarding the assessment of the level of attitudes of M and nurses in all 3 moments of the training program, we noticed that the share of high scores on the items that make up the attitude scale also increases, following the training, from approximately 51% to almost 89%, immediately after the training, so that, 3 months after the training, all respondents obtained scores ranged between 13-18 points (figure no. 18).

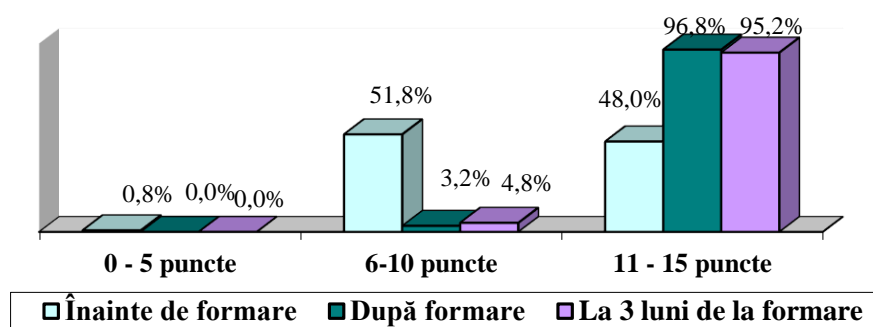
**Figure no. 18 Attitude scale scores**



The score for the items that make up the attitude scale was calculated by summing the correct answers for the 18 attitude questions, so that the values of this score can theoretically vary between 0 and 18; for graphic representation, the scores were divided into 3 ranges: 0-6 points (low scores), 7-12 points (medium scores) and 13-18 points (high scores). Mean scores also show an increase which, following analysis of variance (ANOVA), was found to be significant.

The comparative evaluation of the level of knowledge regarding pregnancy-induced hypertension and gestational diabetes mellitus in the three moments of the evaluation indicates the existence of correct answers that register a significant increase after the completion of the training module and remain at a significantly increased level even 3 months after its completion, compared to the pre-training stage, as shown in figure no. 18.

**Figure no. 18. Knowledge scale scores**



In this case also, the score for the knowledge scale was calculated by summing the correct answers to the 15 items referring to M and nurse knowledge in the field of prevention and management of GD and HTN, so that the values of this score can theoretically vary between 0 and 15; for the graphic representation, the scores were divided into 3 ranges: 0-5 points (low scores), 6-10 points (medium scores) and 11-15 points (high scores). As it can be seen in figure no. 18, the share of high scores (11-15 points) on the knowledge scale, register under the impact of the training, an important increase: from 48%, before the training, to over 95% in the second stage following the training, an increase also validated by the fact that the differences between the mean score in pre-training and the mean scores in the other 2 post-training moments are significant.

An exception is recorded as regards item 18 with reference to the definition of gestational diabetes, for which the increase recorded is not significant. This fact is explainable, considering that in the pre-training stage the respondents answered correctly to this item. Regarding the item related to the definition of proteinuria, for which the difference



between pre-training (M1) and (M3) 3 months after training is not significant, but, also in this case, the weight of correct answers in all 3 moments is very high, over 90%). In addition, it should also be noted that, in the case of 2 items (16 and 25, referring to the range of BP measurement for the diagnosis of preeclampsia and to an item that is not a risk factor for GD, respectively) the percentages of correct answers show a significant decrease 3 months after training compared to immediately after training, but remain significantly higher, however, compared to the pre-training stage. It should be noted that, after training, the scores of all 3 scales are significantly positively correlated with each other, while, in pre-training, between the scores of attitude scale and those of practice scale, there is no significant correlation.

Also, the study participants had the opportunity to report the main impediments most often encountered in providing appropriate healthcare to patients with pregnancy-induced hypertension or gestational diabetes. The high volume of work, doubled by the lack of staff were considered, in all 3 moments. It is worth noticing, however, that the lack of updated protocols with best healthcare practices is considered by M and nurses to be a barrier to good care, even to a greater extent after following the training module and 3 months after it, than in the pre-training stage, while, in the pre-training stage, the lack of courses dedicated to this topic is invoked as an obstacle to a significantly greater extent than in post-training moment.

### **Partial conclusions**

The comparative and correlational analysis for the 3 scales (practices, attitudes, knowledge) demonstrates that the impact of the training on the practices, attitudes and knowledge of nurses and midwives is also supported by the comparative analysis of the total scores, for each of the 3 sets of items . Considering the positive results recorded on all three evaluation scales (practices, attitudes and knowledge) in the immediate post-training moment and 3 months after the completion of the training, the research identified the degree of correlation between age and professional experience. Regarding the relationship between the scores obtained by the respondents and their age, respectively their professional experience, it should be noted that, before the training, the only significant positive correlation was registered between the scores recorded on the practices scale, which increases significantly with age and professional experience. Immediately after the training and 3 months after its completion, both the practice scale scores and the attitude scale scores correlate positively with work experience, being higher with more work experience, while the knowledge score does not show any significant correlation either with age, nor with

experience. This aspect once again demonstrates and supports the significant positive impact of the training program on the level of knowledge, regardless of the age and professional experience of the research participants.

Analysing the results obtained in our study, it appears that M and nurses have significantly improved their level of knowledge, attitudes and practices regarding the health care of patients with HTN and GD after completing the training program, and this improvement is maintained at a high level even 3 months after completing the training program.

However, the study presents some limitations imposed by the relatively small number of M and nurses included in the study and the fact that it took place only at the level of a single profile hospital, but the results draw attention to the need of developing educational programs on healthcare provided by midwives and nurses focused on the care needs of pregnant patients at risk of developing GD and HTN. The results of this study were published in the journal Journal of Medicine and Life [10-11].

## **CHAPTER 6**

### **THE STUDY ON THE RESULTS OF THE IMPLEMENTATION OF SPECIFIC HEALTH CARE PROVIDED BY MIDWIVES AND NURSES TO WOMEN WITH GESTATIONAL DIABETES ADMITTED TO AN OBSTETRICS DEPARTMENT**

The main objective of this study is to improve the quality of health care provided to pregnant patients by increasing the compliance of midwives and nurses to the recommendations regarding the best practices of antenatal and intrapartum care of women with GD admitted to an obstetrics-gynecology department . The aim of this project is to implement evidence-based practice recommendations in the clinical practice of nurses regarding the care of women with GD to ensure patient safety and improve the quality of health care.

Specific objectives of the project:

- To determine current compliance with best practice recommendations regarding the practice of midwives and nurses caring for women with GD during the antenatal and intrapartum period

- Identifying barriers and enablers to improving compliance and developing strategies to address areas of non-compliance
- Improving the knowledge, attitudes and practices of midwives and nurses in the Obstetrics department regarding the care of women with GD
- Implementation of best care practices and care plan development in patients with GD to increase compliance with evidence-based criteria
- Assess changes as a result of implementing strategies to address identified barriers and enhance identified facilitators in the care of women with GD

The Evidence Implementation Project used the JBI Evidence Implementation Framework. The JBI implementation approach is based on the audit and feedback process, along with a structured approach to identifying and managing barriers to adherence to recommended clinical practices. Seven main stages were designed during the project: (1) identification of the practice area for change, (2) engagement of stakeholders (change agents), (3) assessment of the context and readiness to change (situational analysis), (4) practice review (baseline audit) using evidence-based audit criteria, (5) implementing changes in women's care practice with DG, (6) reassessing practice using a follow-up audit, and (7) considering the sustainability of changes in practice (sustainability). This evidence implementation project used the Joanna Briggs Institute's Practical Application of Clinical Audit Audit and Feedback Tool (JBI PACES) and identified key resources for implementing research findings into practice [12].

A number of 30 pregnant patients admitted to the obstetrics and gynecology department of the "Clinical Hospital of Obstetrics and Gynecology Prof. Dr. Panait Sîrbu" between 15-30.04.2021 were included in the analysis. Data related to the audit criteria were collected by means of the audit questionnaire by checking records from medical records, interviewing patients and interviewing midwives and nurses.

The basic audit was carried out between 15.04.2021 and 31.04.2021. The collected data were entered and processed using the JBI PACES application.

The group of the studied population was constituted by the sample of patients and the sample of medical personnel. The group of patients was made up of 30 patients with gestational diabetes hospitalized in the OG ward during the basic audit period who were followed during the antenatal, intrapartum and postpartum periods. The second study sample included in the

analysis was represented by 15 midwives and 15 nurses who provide medical care to pregnant patients with gestational diabetes in the antenatal and postnatal period.

### **Results and discussion**

In relation to criteria 1-10, all the evidence recorded by midwives and nurses in the care plan were evaluated in the antenatal period in all pregnant patients with GD admitted to the Obstetrics department.

Criteria 11-13 were used to assess the evidence of care in the intrapartum period of pregnant patients with GD, while criterion 14 was used for patients in the postpartum period. All criteria in the nursing practice audit questionnaire included checking the records of nurses and midwives, in addition, criteria 2,4,5,6, 10 included interviewing patients. The best practices implementation process was completed on 01.10.2021.

For criterion 1, which assesses whether pregnant women are screened for DG on ward admission, compliance with best practice recommendations was 100%. Regarding criterion 2, the woman with DG receives education about gestational diabetes and additional advice about education in pregnancy (including nutritional therapy, physical activity and glucose monitoring it can be seen that the degree of compliance was 83% in the group of 30 women included in the analysis. Only in 73% of cases a multidisciplinary team is involved in the prenatal care of the woman with DG, while only 83% of the group of women with DG included in the analysis receive an individualized prenatal care plan. can note that only in 87% of cases the woman with DG benefits from training on self-monitoring of blood glucose levels. A maximum percentage of compliance can be observed in the case of the practice of daily self-monitoring of postprandial glucose levels, while only in 90% of the analyzed cases the glycemic level of pregnant women is maintained within a normal range. Specialist consultation for establishing an appropriate diet from a dietitian is carried out in 70% of the analyzed cases. It can be seen that women with gestational diabetes admitted to the obstetrics department did not benefit from a specialist consultation before starting a physical exercise program, and in the group of patients included in the analysis, only 63% of patients do moderate physical exercise of at least 2 times a week.

The assessment of the degree of compliance of care practices of patients in labor and in the postpartum period shows that capillary glucose monitoring is performed hourly during labor and delivery in women with gestational diabetes in 73% of the cases included in the analysis. A compliance of 67% is achieved in the case of the criterion that analyzes whether

capillary plasma glucose is maintained between 4 and 7 mmol/liter during labor and delivery in women with gestational diabetes. A good percentage of compliance is observed in the case of the criterion aimed at the use of intravenous infusion with dextrose and insulin during labor and delivery when plasma glucose is not maintained 4 and 7 mmol / liter. It can also be noted that a good percentage of compliance was registered in the case of the criterion that refers to the rhythmicity of blood sugar level testing in women with gestational diabetes after delivery and before discharge (97%).

At the completion of the initial audit, after the results were recorded in the PACES application, the project team and the management of the clinic where the audit was performed met to plan the steps of the GRIP process. The results of the first audit were analyzed and the reasons why clinical practice did not meet good practice standards were identified.

One of the main barriers to practice not meeting the standard was the lack of knowledge of midwives and nurses regarding the care of women with GD during the antenatal and intrapartum period. Between July 5-9, 2021, the educational intervention was carried out, which included updated information about the main care interventions of midwives and nurses on the woman with GD in the antenatal and intrapartum period.

Another barrier that was identified by the implementation team was the lack of evidence-based recommendations and protocols for the care of women with up-to-date DG. The project manager together with the hospital's director of care performed a literature review by accessing the JBI database and extracted the most recent recommendations regarding the care of women with gestational diabetes. These recommendations were used to draft a care protocol for midwives and nurses caring for pregnant women with gestational diabetes. The care protocol was implemented within the obstetrics and gynecology department until the date of the follow-up audit.

The third barrier identified was inadequate patient education for GD self-management. Along with the training of midwives and nurses, patient education on gestational diabetes self-management has been improved. After the stage of implementation of the best practices, each patient diagnosed with GD benefits from a complete training starting from the first day of hospitalization. Patient education includes two main components focused on the activity of preventing gestational diabetes and self-management of care interventions. The "Mother's School" education program for pregnant women has been completed with a new chapter on

the pregnant woman's attitude to the prevention of GD and self-management of care. The training of mothers is carried out by midwives and nurses through oral exposure, by distributing leaflets or posters on the topic of GD prevention and self-management. The follow-up audit was conducted between 25-27 October 2021, using the same audit criteria and sampling methods as in the baseline audit. Follow-up audit data was entered into the JBI PACES application and helped the audit team examine changing rates of compliance with industry best practices.

### **Partial conclusions**

The aim of this project to implement the best practices in the clinical practice of midwives and nurses was to determine the degree of compliance with the clinical standards of care of women with gestational diabetes in the antenatal and intrapartum period. Following the baseline audit, the barrier analysis helped the implementation team develop and implement three strategies: education of midwives and nurses about providing care to women presenting with GD during the antenatal and intrapartum period, education of patients about prevention and self-care management in GD and facilitating the access of medical staff to the best evidence for the care of patients with gestational diabetes. A follow-up audit was applied 6 months after the completion of the baseline audit, which revealed a degree of compliance of 100% on all audit criteria.

The improvement of the care practices of the patient with gestational diabetes in the obstetrics department was highlighted in the follow-up audit, which demonstrated the effectiveness of the training program and the new revised care protocol with the best best practice recommendations in this field.

The baseline audit indicated that adherence to best practice recommendations reached a low level of compliance, even though the medical staff in the clinic had received training in the past on planning and carrying out the health care of the patient with gestational diabetes. The unavailability of the best evidence of best practices in the field of patient care with DG led to a low degree of compliance on the criteria that concerned patient education, the specialist consultation of the dietician and the specialist consultation before the initiation of physical exercises. In this project to implement the care practices of the patient with gestational diabetes, the implementation team used the feedback obtained during the basic audit in the staff training process. This feedback helped staff to better understand where their practice deviated from the standard of care. Another important step in the implementation

plan was patient education. After the baseline audit, only 63% of patients reported exercising at least 2 times per week. In the implementation plan, the development of an educational guide for patients with gestational diabetes that can provide patients with all the essential information for the management of their own care was established as a priority action. The educational guide for the patient with gestational diabetes was implemented both in the obstetrics department and in the weekly training sessions for mothers within the "Mother's School" project, thus ensuring a dissemination of information also to patients who have not yet been hospitalized in the obstetrics ward for delivery. The effect of the educational intervention is also noticeable in the stage of intrapartum care of the patient with gestational diabetes, which experienced essential improvements after the stage of implementation of the best practices.

Prevention and care management in GD is essential for maternal and child health. The implementation of the educational program among nurses and midwives in the obstetrics department led to a substantial improvement in the care of the patient with gestational diabetes. The results of the initial audit highlighted the need for early intervention in patient education regarding the prevention and self-management of gestational diabetes.

The project translated into the clinical practice of midwives and nurses the best practice recommendations regarding the care of the patient with gestational diabetes. In the future, it is necessary to resume the activities of auditing the practices in order to evaluate the sustainability over time of the implemented measures. The results of this study were published in the journal JBI Evidence Implementation [13].

## **CHAPTER 7**

### **CONCLUSIONS AND RECOMMENDATIONS**

Within this research project, 3 studies were developed which, through the obtained results, tried to add value to the medical practice of midwives and nurses who work in obstetrics and gynecology departments, with the aim of increasing the quality of the medical act . Through the results obtained in this research, we want to emphasize the importance of the care given by midwives and nurses to pregnant patients in all stages of the evolution of a pregnancy and to highlight their role in the medical care systems.

The research activity was structured in three main stages that had in mind the identification of the main pathologies associated with pregnancy at extreme ages, the evaluation of the level of knowledge, attitudes and practices of midwives and nurses regarding the care of patients with GD and GHT and the implementation of a good practice project regarding the care of the patient with GD in an obstetrics and gynecology department within the "Clinical Hospital of Obstetrics and Gynecology Prof. Dr. Panait Sîrbu".

Within this project, several tools were developed that in the future can also be used in other hospitals to improve the care activity:

- Tool for evaluating the knowledge, attitudes and practices of nurses regarding the care of the patient with GD and GHT
- Tool for evaluating care practices given by midwives and nurses to patients with GD.
- Educational program on patient care with GD and GHT
- Care protocol for the patient with GD
- Care plan for the patient with GD.

The first study had the role of identifying the main pathologies developed by patients with pregnancies at extreme ages (patients aged 18 years or older than 39 years) hospitalized in the "Clinical Hospital of Obstetrics and Gynecology Prof. Dr. Panait Sîrbu ". The comparative analysis carried out on the two groups of patients shows a higher incidence of gestational diabetes in the group of patients older than 39 years, compared to the group of women with a maximum age of 19 years in which this pathology was registered only in 5.2% of cases. It can also be observed that also in the case of pregnancy-induced hypertension, the percentage is higher in the group of women over 39 years old (22.9%), compared to the group of women under 19 years old (13%).

The results of this research suggest the need for distinct care approaches for the two categories that take these aspects into account. Thus, in the case of patients with a maximum age of 19, most of whom are in their first pregnancy/birth, but with fewer pathological implications, the care planning provided by midwives and nurses should include a more emphasized educational component (given the lack of experience in growth and in the care of the newborn), while for patients included in the age category  $\geq 39$  years, the plan of care should focus on greater attention in the prevention and treatment of pathological aspects associated with pregnancy, especially the prevention of the most common pathologies such as gestational diabetes, preeclampsia and pregnancy-induced hypertension, but also the early detection of these conditions.



In conclusion, considering the results of this study, we believe that the development of updated care protocols addressed to midwives and nurses working in obstetrics and gynecology departments, as well as training programs on the care provided to patients with GD and GHT can be essential for increasing the quality of the medical act, but also for reducing the complications associated with these pathologies.

Considering the results of the second study within this research project, we proposed the development of a questionnaire to assess the level of knowledge, attitudes and practices of midwives and nurses regarding the care of patients with gestational diabetes and hypertension and of a training program on this topic. Midwives and nurses presented an average level of knowledge with scores between 52.8% and 92.8% for the practices scale, 28.8% and 88.8% for the attitudes scale and 42.7% and 99.2% for the knowledge scale. After participating in the training program at time 2 of the evaluation, immediately after the completion of the training, an important increase in the percentage of correct answers can be observed, which varies between 74.4 and 100% for the knowledge scale, 68.8 and 100% for the attitude scale, and 93.6 and 100% for the practices scale. The positive effect of the training program on the level of knowledge, attitudes and practices is obvious and it can be noted that 3 months after the completion of the educational program the scores on each item remain at a higher level compared to the scores from the initial moment before the training.

Therefore, our study emphasizes the importance of the development and implementation of care protocols based on the best practices in the field and the inclusion in the annual training plan of courses on the topic of care given to patients with GD and GHT. On the other hand, although our study did not evaluate the knowledge of patients regarding these pathologies, we believe that it is absolutely necessary for pregnant patients to benefit from education and information to help the patient better understand the risks of the occurrence of these pathologies and increase compliance with the recommendations of care.

Although the group of the studied population is relatively low, and the research was limited only to the medical staff from a certain profile hospital in Bucharest, the results of this research can represent an important evidence for leadership in health care, because the results of this research argue and substantiate the importance of education continuous medical in the improvement of the medical act given by midwives and nurses.

Considering the fact that the implementation in the process of care provided by M and AM of the best care practices for patients with GHT or GD must also evaluate both the

facilitators and the possible barriers for which the practice cannot reach the standards of good practices, the results our study highlights the main barriers reported by the study participants represented by the high workload, doubled by the lack of staff and the lack of specific care protocols.

The results of our study, as well as the recommendations from the specialized literature, indicate the need to develop a project to implement the best practices regarding the provision of specific care for pregnant patients.

In the third study we evaluated the results of the implementation of a project to implement the best practices regarding the provision of health care to patients with gestational diabetes in all stages of care from the antenatal and intrapartum period.

The main objective of this project was to improve the quality of health care provided to pregnant patients by increasing the compliance of midwives and nurses to recommendations regarding the best practices of antenatal and intrapartum care of women with GD admitted to an obstetric ward- gynecology. This project used the JBI Evidence Implementation Framework and used the Joanna Briggs Institute's Practical Application of Clinical Audit Audit and Feedback Tool (JBI PACES) to identify key resources for implementing research findings into practice. A core audit was developed based on a questionnaire developed based on 14 JBI audit criteria [12]. A plan to implement the change in current practice was developed based on the results of the baseline audit. Six months after the completion of the first audit a new audit was carried out using the same criteria and sampling methods as in the initial audit [12].

The conclusions of the first basic audit that evaluated the care practices of the patient with gestational diabetes indicated that interventions are needed in terms of the education of the medical staff, the education of the patient, the involvement of multidisciplinary teams in the care of the patient, the development of the patient care plan with GD, the training of the patient regarding the self-monitoring of the blood glucose level, establishing the diet of the patient with GD after carrying out a specialist consultation and educating the patient about performing moderate physical exercises at least 2 times a week.

The study also identified the main barriers for which the standard of care was not achieved in the first baseline audit performed in the obstetrics and gynecology department.

The analysis of the results obtained within the implementation team identifies three main barriers for care practice not reaching best practice standards: inadequate knowledge regarding the care of the patient with GD, lack of care protocols based on the best evidence of best practice and inadequate education of the patient.

The results of the first baseline audit indicated low compliance on certain audit criteria, even though in the past medical staff stated that they had benefited from training on this topic. The lack of access to the best evidence of good practices in the field of patient care with GD led to a low percentage of compliance on the criteria that evaluated the education of the patient, the performance of the nutritional consultation and the specialist consultation before the initiation of physical exercises.

The implementation plan included: the development and implementation in the clinical practice of midwives and nurses of an updated protocol for the care of patients with GD, the development of an education guide for patients with GD, the training of all staff in the Obstetrics and Gynecology section and the development of a plan of care adapted to the needs of the patient with gestational diabetes.

Prevention and care management in GD is essential for maternal and child health. The implementation of the educational program among nurses and midwives in the obstetrics department led to a substantial improvement in the care of the patient with gestational diabetes. The results of the initial audit highlighted the need for early intervention in patient education regarding the prevention and self-management of gestational diabetes. The project translated into the clinical practice of midwives and nurses the best practice recommendations regarding the care of the patient with gestational diabetes. In the future, it is necessary to resume the activities of auditing the practices in order to evaluate the sustainability over time of the implemented measures.

Considering the results obtained in this research project, we can conclude that continuing medical education is a particularly important aspect in increasing the medical act and in improving the level of knowledge, attitudes and practices of the medical staff. We consider it opportune that annually in the training plans of midwives and nurses who work in obstetrics and gynecology departments, training should be provided on the topic of patient care with GD and pregnancy-induced hypertension, two extremely common pathologies during the evolution of a pregnancy.

Complementary to the training process, it is essential to implement in all hospitals the clinical audit process, which has the role of determining the degree of compliance with the best recommendations in the field, having the role of increasing the quality of the medical act. Given that clinical audit is now also a legal requirement imposed by accreditation standards, the research project represents a good example of the implementation of best care practices. Patient education is another important aspect of the care process that is highlighted in this research project.

We believe that in the future the model of this research project could be extended to other hospitals in the city or in the country, in order to include a representative number of midwives and nurses in order to be able to extrapolate the research results. Another field that requires the development of additional research is patient education in order to evaluate both the level of knowledge in the field and their own perceptions that could affect the degree of compliance with care recommendations.

Another aspect that requires dissemination and application in other hospitals and specialties is the clinical audit of the care processes, because at this moment in the health systems the clinical audit is a new requirement that must be implemented in the practice of all clinicians according to quality standards. Clinical audit is a method of improving the quality of care carried out following a comprehensive assessment of care practices against a set of criteria established on the basis of the best evidence of good practice, followed by the implementation of changes if the results of the assessment do not conform to the criteria evaluation[14].

Through its results, the project promotes several elements of innovation and originality with the aim of supporting midwives and nurses working in obstetrics and gynecology departments with updated information regarding the care process for patients with gestational diabetes and induced hypertension of pregnancy.

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