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Research Article

Developing an educational program for fourth-year students at Balikesir University's school of health, department of midwifery, to learn and practice antenatal skills

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ABSTRACT

Background: The objective of this study is to develop an educational program to improve the antenatal care practice skills of fourth-year students in the midwifery department at Balikesir University's school of health.
Methods: The control group included 39 students who had taken public healthcare courses in the 2009-2010 academic year. The intervention group consisted of 40 students who had taken the same courses in the 2010-2011 academic year. The study's dependent variable was the skill level; its independent variable was the educational program. The data evaluation guide feedback form was collected. The students' scores for prenatal care were analyzed using the Mann-Whitney U test.
Results: The study found that midwives in the control group, which did not receive the educational program, did not apply some of the steps in prenatal health care, such as examining the bellies of pregnant women, measuring their folic acid, assessing laboratory tests and providing them with information about their examinations. In addition, there were other skills in prenatal health care and communication that this group either never applied or applied only after being reminded. However, almost all of the midwives in the intervention group were found to have used communication skills effectively and to have completed prenatal healthcare in the proper order and in a highly qualified manner.
Conclusion: The educational program developed for midwife education and practice has been successful and effective. Almost all of the people in the control group have fully applied their healthcare follow-up skills.

Keywords: Midwifery education, Public health, Educational program, Curriculum development

INTRODUCTION

In Turkey, education in midwifery began in 1843 with a two-year course that was offered to young girls living in İstanbul. The tasks that the midwives who graduated from this course were able to perform included helping the women deliver their babies and carrying out some small surgical interventions related to gynaecological diseases. After the First World War, midwifery education continued in the village midwifery schools associated with primary and secondary schools and, after 1978, through health courses offered in vocational high schools and two-year midwifery programmes at universities as well. Since 1996, four-year programmes in midwifery education have been offered at the bachelor's level.[1,2] Today, about 1300 midwifery students graduate each year from midwifery departments at 33 universities.[3]

Turkey currently has 50343 registered midwives, 90.1% of whom work under the ministry of health, 8.8% in the

private sector and 1.1% in university hospitals. Among those who work for the Ministry of Health, 16.7%, or 7271, work as nurses, providing nursing services in the ministry's institutions. A full 52.6% of the 45515 midwives working for the ministry are in primary health care facilities; the other 47.4% work in secondary health care facilities. The primary health care facilities include family health centres, population health centres, tuberculosis control dispensaries, cancer early diagnosis and screening centres, mother and child health and family planning centres and oral and dental health centres.[4]

Midwifery is an important field within the preventive health services in Turkey, with maternal and infant health forming the basis of the midwifery services.[2,5] The country's infant mortality rate is 10 per 1000, its maternal mortality rate is 16.4 per 100000 and the rate of those who receive antenatal care is 82%.[4]

Caesarean delivery is relatively common and the rate of caesarean deliveries is 46 %.[6]

Obstetricians and midwives working in family medicine units provide the antenatal care services. According to the ministry of health, follow-ups should be performed at least four times, at the 14th, 24th, 32th and 38th weeks of pregnancy, for normal pregnancies. Antenatal care includes tasks such as taking comprehensive medical histories of the pregnant women, with personal, obstetric and pregnancy-related data; providing education and consultancy; making systemic examinations, such as height, weight, blood pressure and pulse measurements, and performing Leopold's maneuvers. It also involves measuring the symphisis-fundal height, listening to the heartbeats of the infants, offering support in terms of folic acid and iron preparation, administering the tetanus toxoid vaccination, evaluating the laboratory values and scheduling appointments for the next follow-up.[7]

Introduction to the curriculum

The public health course, which includes three hours of theory and eight hours of practice, is given in the fourth year and lasts for 14 weeks. Its basic objective is to equip students with the knowledge and skills required to provide midwifery services in primary health care facilities.

In its broadest sense, the curriculum for this course was developed through a process of design, implementation and evaluation, and by rearranging it based on data that was obtained through the evaluations. The term curriculum development refers to a dynamic process that requires continuous attention.[8] The term curriculum can refer to both a written document and the actual practice of implementing an academic program. Each curriculum is unique and based on the healthcare needs of the population it is designed to serve. Curriculum development and revision is a systematic, logical and dynamic process for achieving organized learning. It enables educators to articulate the characteristics of the graduates and the curriculum design, as well as the content, teaching methods, assessment of students' achievement, program evaluation.[9] The most common curriculum development models are the Taba model, the Tyler model, the Taba-Tyler curriculum development model, the curriculum development model of the Ministry of National Education of Turkey and Demirel's model.[10] This study used the stages of Kern, Harden and Demirel's curriculum development models that are frequently used in medical education (Figure 1).

The stages of curriculum development include determining the needs, objectives and learning targets, the content, the educational strategies, the method of implementation and, finally, the process of evaluation and feedback.[10-12] The curriculum for education in antenatal care was developed according to these stages (Table 1).

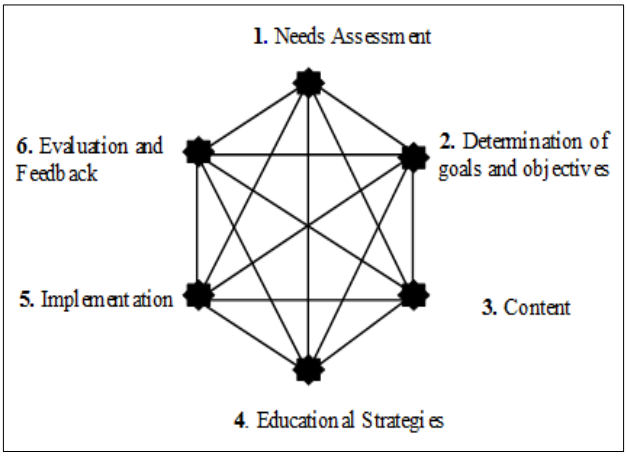

Figure 1: Stages of curriculum development.

Table 1: Steps in the curriculum development model.

Steps in the curriculum development model
1. Determination of needs
1.1. Examining the current curriculum.
2. Determination of objectives and targets
2.1. Describing the skills that the students are expected to have for antenatal care.
3. Content
3.1. Determining topics for the content of the curriculum, including:
3.2. Taking the medical history, providing education and consultancy and performing a physical examination.
3.3. Filling in the pregnancy follow-up cards.
4. Educational methods
4.1. Determining educational methods.
5. Implementation
5.1. Applying curriculum in primary health care facilities.
6. Evaluation
6.1. Evaluating the levels of skills that had been acquired using the developed curriculum.

Stages of curriculum development and previous studies

The first stage of the curriculum development, which includes the determination of needs, revealed that no curriculum had been developed for teaching the skills that the midwifery students should acquire before graduating in public health education. Therefore, a curriculum was developed for antenatal care in midwifery education. The content of the curriculum included the following titles:

- Taking the history of the pregnant woman at antenatal care
- Providing education and consultancy at antenatal care
- Conducting a physical examination at antenatal care

Objectives and learning targets were then developed in detail, in order to ensure that students were able to acquire the antenatal care skills they would need. The educational methods used in the curriculum include presentation, projection and coaching. An introduction was developed for each topic that was taught, explaining the objectives, targets and the daily programme, which was followed by a short practice activity. At the centre of the curriculum, the educational method provided for presentation of the relevant information, then the educator gave the students an opportunity to practice their skills, based on learning guides. For these practice sessions, the students were divided into groups of eight, the educators handled the coaching and the practice skills were applied using the learning guides. After each topic had been taught, one student from each group demonstrated the skills that had been practiced and, in this way, all groups had a chance to "summarize" each topic in the curriculum (Table 1).

The skills of each student were evaluated according to the methods used in the curriculum, as well as through the evaluation guide.

The objective of this study is to develop a curriculum for education in antenatal care and to assess the efficiency of this curriculum.

METHODS

Research group

The fourth-year students studying in the department of midwifery at the Balikesir, school of health in the 2009-2010 academic year formed the control group (n=39); the fourth-year students studying in this department in the 2010-2011 academic year were the intervention group (n=40). All students who were taking the public health course were included in the research, without sampling.

The control group consisted of 39 students who had taken the public health course during the fall semester of the 2009-2010 academic year. The topics specified in the curriculum of the public health course had been explained in class by the trainer. The three-hour theoretical part of the course had been done in the classroom, while the eight-hour practice part had been completed in health centres, under the supervision of a course trainer. No demonstration of the antenatal care had been given during the practice part of the course. The evaluation of skills was based on the education that the students had received over two years. The practical training period for their course had been completed through planning weekly home visits, involving four or five student groups, at eight health centres.

The students had performed the follow-ups for the pregnant women during these home visits. The trainer had not interfered in this practice, and the students had given verbal feedback at the end of it. Data from the control group were collected after the spring semester, when the public health course had finished. Students had performed the follow-ups for the pregnant women at the health centres, and the data collected were based on the evaluation guide.

The intervention group included 40 students who were taking the public health course during the fall semester of the 2010-2011 academic year. The curriculum developed in this study was applied to this intervention group.

Intervention method

The intervention group received the education in October 2010. The theoretical and practical education lasted for two weeks, after which the students, in order to develop their skills more fully, carried out at least three follow-ups with pregnant women. Follow-ups were performed at the health centres or through home visits, using the learning guides. Students asked the pregnant women for permission to carry out a follow-up at their home visits. The research data were collected by the trainer through the evaluation guide (Table 2).

Data collection tools

Learning guide

A learning guide was prepared to enable the students to learn more easily and also to help them evaluate both themselves and each other. This guide provides an educational approach developed in accordance with the principles of adult learning. It is based on the project of strengthening the pre-graduation education on Turkey's reproductive health programme sexual and reproductive health,[13] as well as on safe motherhood's attendee booklet, delivered by the ministry of health's general directorate of maternal and infant health and family planning.[14] Learning guides were developed under the separate titles of antenatal care, taking the history and the antenatal care pregnancy examination. Each step was prepared in great detail in these learning guides.

Kirkpatrick's four-level model was used in the evaluation of the curriculum.[15] However, in this study, Kirkpatrick's evaluation principles were used for the level two evaluation principles. This evaluates the level of learning achieved, including the acquired knowledge and skills and any attitude changes. The antenatal care evaluation guide was used to evaluate learning for this level. The evaluation guide includes the main steps of the learning guides and was developed to evaluate each one of the skills.

Table 2: Steps in the curriculum development model.

Topics	Method	Materials	Duration	Activity
Antenatal care (ANC), taking medical history	Presentation Demonstration Coaching	Computer Projector Blackboard Marker Learning guide Evaluation guide	4x45 min	Explanation of objective and learning targets of the topic. Steps for taking ANC medical history are explained by the trainer. The trainer practices taking a medical history, using the learning guide. Students implement the steps for taking medical histories from pregnant women by working together and assuming the roles of instructive coaching. At the end of the module, practice steps are explained and the topic is summarized.
ANC education and consultancy	Presentation	Computer Projector Blackboard Marker	4x45 min	The trainer explains the education and consultancy topics to be given during pregnancy. Each student determines the ideal weight gain at pregnancy, by calculating the body-mass index, using examples. Students also practice preparing a sample meal for one day. A general assessment is made at the last presentation.
ANC physical examination	Presentation Demonstration Coaching	Computer Projector Blackboard Marker Learning guide Evaluation guide Photoscope Examination model of pregnant woman Measuring tape	4x45 min	The trainer explains the steps in the physical examination for practice, through the learning guide. With the trainer coaching them, the students divide into groups of four to practice on a model of a pregnant woman. At the end of the training, one student from each group performs a practice examination, with explanations.

Data collection method

Data for the curriculum were collected and graded by the researcher, using the evaluation guides. The students had practiced their skills on the pregnant women, or the children or infants, and the trainer marked the appropriate choice as follows: "0: skill should be developed", "1: sufficient" or "2: expert," on the evaluation guide, according to the performance of each student.

Evaluation of the data

The SPSS 15.0 package programme was used for evaluating the data. Descriptive characteristics were evaluated through number and percentage distributions. The education scores of both the control group and the intervention group were compared with the test of conformity to normal distribution, and it was determined that they did not show a normal distribution. The students' antenatal care and child and infant follow-up scores were analysed through the Mann-Whitney U test.

Ethical approval

The approval for the research was obtained from Balikesir University's school of health.

RESULTS

The skills in taking the antenatal medical histories and conducting the physical examinations were evaluated for both the control group, which did not receive an education according to the curriculum, and the intervention group, which did. The results are given in Table 3 and Table 4.

For the stage involving taking the medical histories of the pregnant women during their antenatal care periods, the

students in the control group were either incompetent, or competent only with the help of the trainer, in applying the following skills: receiving personal information, taking the obstetric history, taking the medical history, questioning the habits and medicines, asking about the prepregnancy contraceptive method, planning the place of delivery and filling out the pregnant woman's follow-up form

However, all of the students in the intervention group filled out the pregnant women's follow-up forms completely (Table 3).

Table 3: Evaluation of the skills of the control and intervention groups in taking medical histories at the antenatal care period.

Steps for taking medical history at antenatal care period	Control group (n=39)			Intervention group (n=40)		
	0	**1**	**2**	**0**	**1**	**2**
	%	%	%	%	%	%
Using communicative skills	56.4	43.6	-	2.5	-	97.5
Receiving personal information	-	100.0	-	-	7.5	92.5
Taking the medical history	-	100.0	-	-	7.5	92.5
Questioning the obstetric history	-	100.0	-	-	15.0	85.0
Examining the tetanus toxoid	35.9	17.9	46.2	2.5	-	97.5
Taking the current pregnancy history	17.9	82.1	-	-	5.0	95.0
Calculating the estimated delivery date	89.7	2.6	7.7	2.5	-	97.5
Examining pregnancy complaints	82.1	12.8	5.1	-	2.5	97.5
Questioning habits	-	100.0	-	-	2.5	97.5
Questioning the medicines taken	-	100.0	-	-	2.5	97.5
Asking about the pre-pregnancy period	-	100.0	-	-	2.5	97.5
Planning the place of delivery	-	100.0	-	2.5	-	97.5

0: The step was not applied, was applied incorrectly or was not applied at a proper time
1: There were deficiencies in the practice; the trainer needed to help or remind about something
2: The step was applied non-stop and without assistance, at the proper time

Table 4: Evaluation of the skill levels of the control and intervention groups in conducting the physical examination during the antenatal care period.

Skill steps for conducting the antenatal care physical examination	Control group (n=39)			Intervention group (n=40)		
	0	**1**	**2**	**0**	**1**	**2**
	%	%	%	%	%	%
Carrying out the physical examination	-	100.0	-	-	10.0	90.0
Conducting the abdominal examination	100.0	-	-	15.0	2.5	82.5
Performing Leopold's maneuver	12.8	12.8	74.4	2.5	-	97.5
Acquiring information about the pregnancy complaints	82.1	7.7	10.3	-	20.0	80.0
Providing consultancy to the pregnant woman	87.2	12.8	-	-	27.5	72.5
Explaining the use of folic acid and iron	100.0	-	-	5.0	-	95.0
Tetanus vaccine according to the vaccination calendar	89.7	-	10.3	2.5	-	97.5
Evaluation of the laboratory tests	100.0	-	-	5.0	-	95.0
Informing the pregnant woman about examination	100.0	-	-	5.0	-	95.0
Recording the findings on the follow-up form	-	-	100.0	-	-	100.0
Giving an appointment for the next examination	100.0	-	-	-	5.0	95.0

0: The step was not applied, was applied incorrectly or was not applied at a proper time
1: There were deficiencies in the practice; the trainer needed to help or remind about something
2: The step was applied non-stop and without assistance, at the proper time

All of the students in the control group received 0 points in conducting abdominal examinations, explaining the use of folic acid and iron, evaluating the laboratory tests, explaining the examination to the pregnant women and making an appointment for the next examination. However, this group got 1 point for their physical examinations and 2 points for recording the findings on the follow-up forms.

All students in the intervention group received 2 points for recording the findings on the pregnant women's follow-up forms. However, 27.5 % of them got 1 point for providing consultancy to the pregnant women, 20.0 % got 1 point for giving information to address pregnancy complaints and 15.0 % got 0 points for conducting the abdominal examination (Table 4).

The score average of the intervention group in taking the histories for the antenatal care period is 27.3 ± 1.9, while the control group's score average is 7.2 ± 1.9. Also, for the physical examination, the score average of the intervention group is 20.6 ± 3.2, and the control group's is 5.6 ± 0.9. The intervention group's total score average for antenatal care is 49.9 ± 4.9, whereas the control group's is 13.4 ± 2.4.

Comparing the score averages of both groups for taking the histories, conducting the physical examinations and handling antenatal care showed the scores of the intervention group to be significantly higher (Table 5).

Table 5: Comparison of the antenatal care scores of the control and intervention groups.

Stages of antenatal care	Maximum score	Control group (n=39)	Intervention group (n=40)	P*
		X ± S	X ± S	
Taking history	30	7.2 ± 1.9	27.3 ± 1.9	<0.0001
Physical examination	22	5.6 ± 0.9	20.6 ± 3.2	<0.0001
Antenatal care	60	13.4 ± 2.4	49.9 ± 4.9	<0.0001

*Mann-Whitney U test

DISCUSSION

The skills that people develop are directly related to the education they receive when learning their professions.[16] In order for them to provide qualified antenatal care, students are expected to become skilled mainly in taking the histories and conducting the physical examinations.[17] The scores for these steps were found to be relatively lower in the control group because the members of this group had not received their education according to the developed curriculum. Those in the intervention group, however, had received their education in line with this curriculum, using the learning and evaluation guides developed for the antenatal care.

Health professionals who have good communication skills can interact more effectively with the pregnant women. Poor communication skills can affect how medical histories are taken and, consequently, prevent a qualified follow-up. Establishing a healthy communication with the pregnant women at the stage when the health professionals are taking histories also enhances the participation of these women. Considering, then, that each follow-up relies heavily on good communication with the pregnant woman, these skills are essential for midwifery students to acquire.

Since providing the students with instruction about how to communicate helps them to develop both skills and attitudes, this education should be given, along with a chance to practice the skills. A full 56.4 % of those in the control group were unable to perform the required steps for welcoming the pregnant women, establishing communication with them and using effective communication skills. Clearly, the fact that the control group received no education in developing skills for communicating with the pregnant women and had no opportunity to practice this contributed to the lower scores they received. On the other hand, among the intervention group, which had received education in communication skills, with the learning and evaluation guides developed for this, all of the students were found to be successful in establishing communication with the pregnant women and using their communication skills effectively. These students conducted their entire follow-ups independently, according to the practice outlined in the curriculum, and this also enhanced the further development of their communication skills. The fact that the curriculum includes concepts related to the communication skills, such as the importance of communicating effectively with the women at their follow-ups and what to address in the communication, is important. This course, then, helped the students not only to acquire the basic communication skills but to find ways to develop new skills as well.

Receiving education in communication skills helps to increase these skills; clearly, they can be learned and they can be developed.[18] After establishing the importance of communication skills in nursing education, the curriculum became effective through the development of methods for teaching these skills.[19-21]

Taking detailed medical, personal and obstetric histories of the pregnant women is of paramount importance for the health of both the women and the fetuses. The information that is collected by taking histories during the pregnancy helps to determine the risk factors.[22] As a result of priorities established in the health services in

recent years, it has become increasingly important for health professionals to enhance their skills in taking histories.[23]

The control group in our study performed few of the steps for taking the histories and some of the steps that were done were incomplete. The steps that were investigated the least in taking the histories were calculating the estimated date of delivery and addressing the pregnant women's complaints. The skills that were performed incompletely included collecting personal information, taking medical and obstetric histories, discussing the habits and medicines, asking about the pre-pregnancy contraceptive methods and planning the place of delivery. It is difficult for midwives who have not had special training in this area to take effective histories. Since taking these histories involves both verbal and non-verbal communication skill,[24] the difficulty in applying these communication skills is another reason why the midwives avoided taking the women's histories

The skills that the intervention group performed incompletely include receiving personal information and taking the obstetric and medical histories. Although this group followed the practices outlined in the educational guide for the steps involved in taking the histories, they skipped some steps or applied them only when reminded to do so. Performance was deemed to be incomplete if a risk situation the student detected in the obstetric and medical histories was not addressed in detail. Particular characteristics that affected the learning of some of the students may also have caused them to take incomplete histories. However, the students showed higher performance in relation to questions about the uncomplicated habits, the medicines and contraceptive methods, calculating the estimated date of delivery and planning the place of delivery.

The skills that the students in the control group used for the physical examinations were found to be incomplete. None of the students applied the steps that involved abdominal examination, explaining the use of folic acid and iron to the pregnant women, evaluating the laboratory tests and scheduling appointments for the next examination. However, these students performed better in the steps for recording the findings on the follow-up forms and performing Leopold's maneuvers.

In the literature, there is no study that evaluates the competencies of student midwives in relation to the antenatal care they provide. However, studies evaluating the antenatal care services provided by certified midwives are available, and these reveal certain deficiencies in their services.[6] During their training, students practice according to the skills required, but if the appropriate education is not offered to them, this leads to gaps in their learning. Deficiencies in their education result from the fact that little or no attention is paid to antenatal care during their training, these skills are not taught in the laboratories before graduation and students are not made to acquire the skills needed to perform the comprehensive and qualified follow-ups that are necessary for primary health care. By being able to practice these skills, students learn and apply antenatal care according to the follow-up performed by the midwives. The public health applications in the education of midwives are particularly important because midwives working in the field are seen as role models, the infants' follow-up records are kept in this area and family planning consultancy is given here. Effective communication skills are critical for midwifery to be considered a professional occupation. The students' skills in providing training and consultancy to address the women's complaints in their pregnancies were found to be incomplete because these topics had not been discussed when the students had taken the histories.

Measuring tension, weight, pulse, varicosis and oedema are the most important controls performed during the physical examination for antenatal care. Leopold's maneuvers are another key topic to address in midwifery education. Although it is a skill that is completely applied, its rate of application was 74%. The Turkish Population and Health Survey also indicates that Leopold's maneuvers have been applied to 74% of all pregnancies during the last five years.[6]

Information and consultancy to the pregnant women, in order to address their complaints, was given incompletely or only when the student was reminded about it. Although almost all of the students detected that the pregnant women had complaints, they did not provide any information about them. The skills needed for providing education and consultancy require being knowledgeable about those specific topics. As a result, if students were not well informed, they may not have been able to give information to the women. The step that was not applied at all was the abdominal examination. This skill may have been evaluated as "not performed" simply because it was not expressed verbally by the students.

The significant difference detected between the follow-up score averages of the control group and the intervention group shows that the curriculum did achieve its goal. It was seen that the antenatal care was performed exceptionally well as a result of the development of a curriculum in which competency-based and humanistic educational techniques are used for education in midwifery. This fact demonstrates that the curriculum that was developed is successful and facilitates effective learning.

CONCLUSION

The development of a curriculum aimed at helping students to acquire antenatal care skills in a planned manner was first applied to education in midwifery. The successful functioning of the programme and the positive feedback from students will be effective in maintaining continuity in the on-going process of its development.

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