

Differences in Required Antenatal Care Skills at Graduation Based on Midwifery Curriculum

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ABSTRACT

Objective: This quantitative descriptive study used a questionnaire to clarify differences in antenatal care skills required for graduation from midwifery education related to the length of the course.

Materials and Methods: Questionnaires returned from 69 teachers at educational institutions throughout Japan with a midwife training course were analyzed. Using the "Items and achievements related to antenatal care skills at graduation from midwifery school" document created by the authors, difference related to the necessity and attainment of antenatal care skills required at the time of graduation were investigated, with focus on differences related to length of the study term.

Results and Conclusion: The results showed no differences in antenatal care skills considered necessary or attainment level in regard to the curriculum offered. However, for support of cases with a high-risk pregnancy or fetal abnormality, the attainment level required is low and it will be necessary to devise a more effective learning program.

KEY WORDS

midwifery education, midwifery care skills, required competencies, attainment at graduation, antenatal care

INTRODUCTION

In 2019, the International Confederation of Midwives (ICM) presented "Essential Competencies for Midwifery Practice", subsequently revised in 2021¹⁾, to show essential competency for midwifery practice, which was divided into four categories; general competencies, competencies specific to pre-pregnancy and antenatal care, competencies specific to care during labour and birth, and competencies specific to ongoing care of women and newborns. ICM then expects to design a curriculum that will enable students to obtain knowledge as stated in the "Global Standards for Midwifery Education"²⁾, and acquire qualification for training midwives to gain such competency. However, it is possible that not all graduates have the necessary skills to provide high-quality care upon completion of midwifery education, because of differences in length of study and curriculum³⁾.

In Japan, the term of study for midwifery education is defined as one year or more after completing basic nursing education, and the curriculum is determined. Educational institutions then create distinctive study programs based on their educational philosophy and conduct lectures, seminars, and practical training. As a result, various courses of study are available, such as two-year education at a graduate school or professional graduate school, one-year education at a university advanced course or vocational school, and specialized education conducted in parallel with nursing education at a university. With the wide variety of courses becoming available, the door is widening to accept students whose aim is to become a midwife. Nevertheless, a survey conducted by the Japan Society Midwifery Education (JSME) revealed various levels of attainment due to differences among the educational institutions and courses offered⁴⁾.

In order to elucidate a certain level of attainment necessary at the time of graduation, the Ministry of Health, Labour and Welfare of Japan

presented a document regarding practical abilities required of midwives titled "Practical abilities required of midwives and achievement goals at graduation (revised)"⁵⁾. However, the items provided therein are comprehensive. Therefore, prior to research related to the present report, the authors conducted a study regarding midwifery care skills used in related training institutions in Japan for the purpose of creating standards for care skills required for graduation. Necessary skills and attainment goals were collected and analyzed, which resulted in items considered necessary for evaluation of antenatal care skills.

Using those evaluation items, the present study targeted educators in a position to evaluate students at the time of graduation with use of a questionnaire. Furthermore, based on those evaluation items, differences regarding attainment of the minimum antenatal care skills required at the time of graduation were examined by comparing the number of years of midwifery education and training. This study was conducted as a basic survey to determine whether items used for evaluation of antenatal care skills that we previously created are appropriate.

METHODS

Study Design

This quantitative descriptive study was performed by use of a questionnaire. Based on information regarding evaluation of antenatal care skills obtained from educational institutions with midwifery training courses throughout Japan, items related to educational content and achievement level at the time of graduation from midwifery education were analyzed (Table 1). From those results, differences related to number of years of training as part of midwifery education were determined.

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Table 1: Items and achievements related to antenatal care skills at graduation from midwifery school

No.	Evaluation item
1	Method for determination of pregnancy according to timing can be selected
2	Calculation of expected date of delivery is possible
3	Able to determine present number of weeks pregnant
4	Can collect necessary information from existing materials (medical charts, maternal and child health handbooks)
5	Necessary information can be collected by interview
6	Accurate information can be collected by visual observation of the whole body (abdomen, lower limbs, vulva, breasts, etc.)
7	Accurate information based on palpation can be obtained (Leopold palpation maneuvers, edema, breast condition, etc.)
8	Accurate information based on auscultation can be obtained (wearing NST, monitoring heartbeat of baby using Doppler, etc.)
9	Accurate information based on measurements can be obtained (fundal height/abdominal circumference, blood pressure, weight, extrapelvic measurement, etc.)
10	Assistance with a vaginal examination is possible
11	Necessary information can be collected from examination data (clinical examination, ultrasonic tomography)
12	Maternal health and physical changes can be determined (fundal height /abdominal circumference, vital signs, edema, breast changes, minor issues, etc.)
13	Number of fetuses, fetal presentation, fetal orientation, and fetus position can be determined
14	Fetal health can be determined
15	Fetal development can be determined
16	Status of fetal appendages can be determined
17	Future progress based on current state can be predicted
18	Able to collect necessary information and make determinations regarding psychological and mental aspects (acceptance of pregnancy, self-value, anxiety, changes in body image, attachment to fetus, acquisition of parental role)
19	Able to collect and determine necessary information regarding social and cultural aspects (partner's and others' perception of pregnancy, family role adjustments, support status, economic situation, working situation)
20	Able to collect and determine necessary information regarding childbirth and childcare behavior (childbirth preparation status, birth plan)
21	Able to provide psychological and mental support (pregnancy acceptance, attachment, parental role acquisition, etc.)
22	Assistance with social and cultural aspects is possible (forming family relationships, family role adjustments, utilization of various social resources and systems, etc.)
23	Able to provide instructions regarding basic life behaviors related to maintaining a stable pregnancy (meals, excretion, sleep, movement, exercise/rest, cleanliness)
24	Able to provide daily life support in consideration of the will and preferences of the pregnant woman
25	Able to provide support for healthy life maintenance and improvement for pregnant woman and family members
26	Able to provide support for prevention and mitigation of minor issues
27	Able to provide support for breastfeeding
28	Able to provide support for childbirth preparation for pregnant woman and family members (childbirth preparation education, birth plan)
29	Able to provide support for parental role acquisition and childcare preparation
30	Effects of the course of pregnancy on delivery, puerperium, and child-rearing period can be predicted, and support provided
31	Able to provide support for high-risk pregnancy
32	Able to provide support for pregnant woman and family members regarding fetal abnormalities or intrauterine fetal death

The questionnaire was an anonymous self-administered survey sent and returned by mail, and conducted from September to November 2018.

Subjects of research and analysis

The subjects were instructors who worked at 201 different educational institutions with midwife training courses nationwide (as of April 2018) and conducted midwifery education. Those schools included 36 that offered a two-year course (graduate school) and 84 a one-year course (university special/advanced, junior college, vocational school), as well as 81 that provided a course in parallel with university nursing education for midwifery education teachers.

Sixty-nine instructors replied, for a response rate of 34.3%. They were then classified into the following three groups according to the length of time needed to complete the midwifery training course.

Two-year course: two-year educational course at a graduate school after completing nursing education.

Undergraduate education: curriculum conducted in parallel with nursing education as part of undergraduate education at a university.

One-year course: one-year educational course conducted as advanced instruction at a university or specialized training school after completing nursing education.

Based on that classification, there were 13 instructors in the two-year course, 27 in the undergraduate education, and 29 in the one-year

course groups. Those who returned questionnaires with missing answers were excluded from analysis regarding degree of necessity and degree of attainment. As a result, 13 two-year course (no exclusions), 26 undergraduate education (one exclusion), and 29 one-year course (no exclusions) instructors were analyzed. Regarding attainment, 13 (no exclusions), 23 (4 exclusions), and 29 (no exclusions), respectively, were analyzed.

Questionnaire items

The questionnaire included items related to the curriculum and length of study provided by the educational institution to which the instructors belonged, as well as degree of necessity and attainment of items regarding the ability to provide midwifery care at the time of graduation from midwifery education. The degree of necessity refers to whether or not an item of practical ability was attained at the time of graduation. In addition, level of attainment refers to amount of practical ability required at the time of graduation.

Items utilized for evaluation of antenatal care skills at the time of graduation were collected from evaluation tables and attainment goals related to midwifery care used by educational institutions nationwide, and were then analyzed and used for evaluations in the present study (Table 1).

The necessity of each evaluation item was divided into five levels; 5 necessary, 4 somewhat necessary, 3 neither necessary nor unnecessary, 2 somewhat unnecessary, and 1 unnecessary. The level of achievement for

Table 2 Necessity of antenatal care skills

	two-year		undergraduate		two-year		p value
	course n = 13		education n = 26		course n = 29		
	median	min-max	median	min-max	median	min-max	
1 Method for determination of pregnancy according to timing can be selected	5	3-5	5	4-5	5	4-5	0.170
2 Calculation of expected date of delivery is possible	5	4-5	5	4-5	5	5-5	0.126
3 Able to determine present number of weeks pregnant	5‡	4-5	5	4-5	5‡	5-5	0.005
4 Can collect necessary information from existing materials	5	4-5	5	5-5	5	4-5	0.404
5 Necessary information can be collected by interview	5	4-5	5	4-5	5	4-5	0.815
6 Accurate information can be collected by visual observation of the whole body	5	4-5	5	4-5	5	4-5	0.522
7 Accurate information based on palpation can be obtained	5	4-5	5	4-5	5	5-5	0.317
8 Accurate information based on auscultation can be obtained	5	5-5	5	4-5	5	5-5	0.446
9 Accurate information based on measurements can be obtained	5	5-5	5§	3-5	5§	5-5	0.014
10 Assistance with a vaginal examination is possible	5	2-5	5	2-5	5	3-5	0.896
11 Necessary information can be collected from examination data	5	4-5	5	4-5	5	5-5	0.126
12 Maternal health and physical changes can be determined	5	4-5	5	4-5	5	5-5	0.317
13 Number of fetuses, fetal presentation, fetal orientation, and fetus position can be determined	5	4-5	5	4-5	5	4-5	0.931
14 Fetal health can be determined	5	4-5	5	4-5	5	4-5	0.657
15 Fetal development can be determined	5	4-5	5	4-5	5	4-5	0.710
16 Status of fetal appendages can be determined	5	4-5	5	4-5	5	4-5	0.625
17 Future progress based on current state can be predicted	5	4-5	5	4-5	5	4-5	0.852
18 Able to collect necessary information and make determinations regarding psychological and mental aspects	5	4-5	5	4-5	5	4-5	0.766
19 Able to collect and determine necessary information regarding social and cultural aspects	5	4-5	5	4-5	5	4-5	0.992
20 Able to collect and determine necessary information regarding childbirth and childcare behavior	5	4-5	5	4-5	5	4-5	0.815
21 Able to provide psychological and mental support	5	4-5	5	4-5	5	4-5	0.299
22 Assistance with social and cultural aspects is possible	5	4-5	5	4-5	5	4-5	0.625
23 Able to provide instructions regarding basic life behaviors related to maintaining a stable pregnancy	5	4-5	5	4-5	5	4-5	0.766
24 Able to provide daily life support in consideration of the will and preferences of the pregnant woman	5	4-5	5	3-5	5	4-5	0.908
25 Able to provide support for healthy life maintenance and improvement for pregnant woman and family members	5	4-5	5	4-5	5	3-5	0.935
26 Able to provide support for prevention and mitigation of minor issues	5	4-5	5	4-5	5	4-5	0.522
27 Able to provide support for breastfeeding	5	4-5	5	3-5	5	4-5	0.064
28 Able to provide support for childbirth preparation for pregnant woman and family members	5	4-5	5	4-5	5	4-5	0.651
29 Able to provide support for parental role acquisition and childcare preparation	5	4-5	5	3-5	5	4-5	0.509
30 Effects of the course of pregnancy on delivery, puerperium, and child-rearing period can be predicted, and support provided	5	4-5	5	3-5	5	4-5	0.339
31 Able to provide support for high-risk pregnancy	5	4-5	5	3-5	5	3-5	0.717
32 Able to provide support for pregnant woman and family members regarding fetal abnormalities or intrauterine fetal death	4	2-5	5	1-5	5	2-5	0.339

each evaluation item was also divided into five levels; 5 can be implemented by oneself, 4 can be implemented with a little advice, 3 can be implemented with guidance, 2 can be implemented through on-campus exercises, and 1 understood as gained knowledge. In addition, achievement levels five to three were explained as follows to provide the same understanding.

- 5; Can be implemented by oneself: a state in which one can make decisions, and act independently using knowledge and skills without receiving advice.
- 4; Able to implement with a little advice: advice needed, but able to make judgments and act independently using one's own knowledge and skills
- 3; Can be implemented with guidance: advice and supervision required, though has ability to make decisions and act using one's own knowledge and skills

Analysis Subjects and Statistical Analysis

Descriptive statistics were determined for the basic attributes and endpoints analyzed. A Kruskal-Wallis test was used to compare the three educational groups (two-year graduate school course, one-year undergraduate course, one-year training course) for each item related to need and attainment of antenatal care skills at the time of graduation from midwifery education. For degree of necessity, differences in abilities required by educators according to the length of study were analyzed. As for attained capability, differences in levels of attainment considered necessary by educators at the time of graduation from midwifery education were analyzed based on the length of study. Additionally, items for which a significant difference was observed were tested using Bonferroni's multiple comparison test. All analyses were performed using the IBM SPSS Statistics software package, version 23, with the level of statistical significance less than 5%.

Table 3 Attainment of antenatal care skills

	two-year course		undergraduate education		two-year course		p value
	n = 13		n = 23		n = 29		
	median	min-max	median	min-max	median	min-max	
1 Method for determination of pregnancy according to timing can be selected	4	1-5	4	1-5	5	1-5	0.157
2 Calculation of expected date of delivery is possible	5	4-5	5§	2-5	5§	5-5	0.016
3 Able to determine present number of weeks pregnant	5	1-5	5	3-5	5	3-5	0.289
4 Can collect necessary information from existing materials	5	4-5	5	4-5	5	3-5	0.055
5 Necessary information can be collected by interview	5	4-5	4	3-5	4	3-5	0.009
6 Accurate information can be collected by visual observation of the whole body	5	3-5	4	3-5	4	3-5	0.127
7 Accurate information based on palpation can be obtained	5	3-5	4	3-5	4	3-5	0.130
8 Accurate information based on auscultation can be obtained	5	4-5	5	3-5	5	3-5	0.506
9 Accurate information based on measurements can be obtained	5	4-5	5	3-5	5	3-5	0.387
10 Assistance with a vaginal examination is possible	5	1-5	4	3-5	4	3-5	0.130
11 Necessary information can be collected from examination data	5	4-5	4	2-5	4	3-5	0.413
12 Maternal health and physical changes can be determined	5	4-5	4	3-5	4	3-5	0.446
13 Number of fetuses, fetal presentation, fetal orientation, and fetus position can be determined	5	1-5	4	3-5	4	3-5	0.418
14 Fetal health can be determined	5	3-5	4	3-5	4	3-5	0.115
15 Fetal development can be determined	5	3-5	4	3-5	4	3-5	0.483
16 Status of fetal appendages can be determined	4	1-5	4	3-5	4	3-5	0.973
17 Future progress based on current state can be predicted	4	3-5	4	3-5	4	3-5	0.253
18 Able to collect necessary information and make determinations regarding psychological and mental aspects	5	3-5	4	3-5	4	3-5	0.054
19 Able to collect and determine necessary information regarding social and cultural aspects	4	3-5	4	3-5	4	3-5	0.163
20 Able to collect and determine necessary information regarding childbirth and childcare behavior	5	3-5	4	3-5	4	3-5	0.206
21 Able to provide psychological and mental support	4	3-5	4	3-5	4	3-5	0.175
22 Assistance with social and cultural aspects is possible	4	3-5	4	3-5	4	3-5	0.086
23 Able to provide instructions regarding basic life behaviors related to maintaining a stable pregnancy	5	3-5	4	3-5	5	4-5	0.087
24 Able to provide daily life support in consideration of the will and preferences of the pregnant woman	4	3-5	4	3-5	4	3-5	0.155
25 Able to provide support for healthy life maintenance and improvement for pregnant woman and family members	4	1-5	4	3-5	4	2-5	0.405
26 Able to provide support for prevention and mitigation of minor issues	4	3-5	4	3-5	4	3-5	0.268
27 Able to provide support for breastfeeding	4	3-5	3	3-5	4	3-5	0.081
28 Able to provide support for childbirth preparation for pregnant woman and family members	5	3-5	4	3-5	4	3-5	0.072
29 Able to provide support for parental role acquisition and childcare preparation	5	3-5	4	3-5	4	3-5	0.065
30 Effects of the course of pregnancy on delivery, puerperium, and child-rearing period can be predicted, and support provided	4	2-5	4	3-5	4	3-5	0.173
31 Able to provide support for high-risk pregnancy	3	3-4	3	1-4	3	2-4	0.477
32 Able to provide support for pregnant woman and family members regarding fetal abnormalities or intrauterine fetal death	3	1-4	3	1-5	3	1-4	0.875

RESULTS

Necessity of antenatal care skills (Table 2)

The median score was 5.0 (necessary) for all 32 items analyzed in the undergraduate education and one-year courses. As for the two-year programs, one item (evaluation item no. 32) had a median value of 4.0 (somewhat necessary), while all other items had a median value of 5.0. In a comparison of the two- and one-year courses, only evaluation item no.3 showed a significant difference, and the only significant difference found when comparing the undergraduate with the one-year course was item no.9. These two items were significantly higher in the one-year course.

Attainment of antenatal care skills (Table 3)

Of the 32 items, 30 (other than no.31 and no.32) were rated as 5.0 (can be implemented by oneself) or 4.0 (able to implement with a little advice) for all of the study courses. The only significant difference between the undergraduate and the one-year course was noted for item no.2, while no.5 was the only item with a significant difference in a comparison between the undergraduate and two-year courses. These two items were significantly lower for undergraduate education. On the other hand, there were no significant differences between the two-year and one-year courses.

DISCUSSION

Necessity of antenatal care skills

The present study investigated the degree of necessity of midwifery competence during pregnancy care, and found that all educational courses provided either a "necessary" or "somewhat necessary" level. In addition, a comparison between curriculums showed that even the two items (no.3, no.9) with significant differences were rated as "necessary" (5.0). Based on these results, it is thought that the items related to antenatal care skills included in the survey form used are necessary for all types of training courses. The competency for antenatal care addressed by the questionnaire nearly covers all contents related to competency specific to care pre-pregnancy and antenatal noted in the ICM "Essential Competencies for Midwifery Practice (revised 2021)"¹⁾. In the future, it is thought that the present findings can be used for evaluation of antenatal care skills at the time of graduation.

Attainment of antenatal care skills

There were scant differences observed in comparisons of the educational programs. Thus, it is considered that there is no significant difference in level of antenatal care skills that students reach at the time of graduation among the programs offered. However, the JSME survey noted differences in level of attainment depending on the curriculum and educational institution⁴⁾. This reflects the concern of Bharj KK *et al.*, who noted that not all midwives have the required competency to assist women and newborns due to differences in type and length of the various training programs³⁾. It is thus considered that a problem of midwifery education is that even though the educational contents and attainment levels that teachers regardless of training years consider to be desirable are the same, the actual attainment levels differ.

While the need to enhance the curriculum in order to raise the level of midwifery education is recognized, how to fit a wide-ranging curriculum within a specified educational period is recognized as a common issue worldwide⁶⁾. As for midwifery education conducted in Japan, it is stipulated that at least one year of dedicated study must be done after completing basic nursing education. However, at some four-year universities, midwifery education is offered as an optional course of study during nursing education aimed at students who desire to become a nurse (undergraduate education course) and some subjects related to midwifery may be omitted because they overlap with those regarding nursing⁷⁾. In addition, at graduate schools that offer midwifery education over two years, in addition to the midwifery curriculum, a master's course curriculum is also taken at the same time. Therefore, in some graduate schools, the actual midwifery education period is only for one year. As a result, the current situation for midwifery education includes that being conducted within a shorter period than the term of study considered necessary for each educational course and there is an undeniable possibility that sufficient education is not being provided to allow the students to reach the originally desired level that.

For many of the evaluation items, each of the educational courses attained the level of "can be implemented by oneself" or "able to be implemented with a little advice". Nevertheless, regarding support for women with a high-risk pregnancy, or family members confronted with fetal abnormalities or prenatal death, the level of attainment was lower than the other items in all of the curricula and generally had a level of "can be implemented with guidance"

The central parts of the unique work of a midwife is care during the pregnancy, labor, puerperium, and newborn periods, which are expected to proceed normally. As part of the regulations for designation of schools for public health nurses, midwives, and nurses, which also stipulate the curriculum for midwifery education, it is required that approximately 10 normal delivery cases should be assisted⁸⁾. Therefore, low-risk education is prioritized in midwifery basic education. When providing support for pregnant women who have experienced fetal abnormalities or fetal death, midwives are placed into a position of involvement with anxiety^{9,10)}, which can be very difficult for students. In addition, the "Practical abilities required of midwives and goals for graduation (revised)" document provided by the Ministry of Health, Labour and Welfare stipulates only that the goals should be understood and does not require that midwives are able to implement them⁹⁾. Therefore, it is thought that the level is low as compared with other items.

On the other hand, support for fetal abnormalities, intrauterine death, and high-risk pregnancies is an important role for midwives who are close to the clients they serve. In particular, with the increased num-

ber of older women who become pregnant because of the increasing sophistication of reproductive medicine, the numbers of pregnant women with a high risk for obstetric complications (gestational hypertension, threat of premature birth, premature birth, placenta previa, placental abruption, etc.) or other health-related issues (diabetes, heart disease, thyroid disease, etc.) are rising¹¹⁾. As a result, the possibility of involvement of midwifery students in high-risk cases as part of clinical practice is also increasing. In addition, it is fully conceivable that midwifery practice for high-risk pregnant women will begin immediately after graduation. As a result, a level of achievement higher than "can be done under guidance" at the time of graduation is considered to be required.

In the 2022 curriculum revision, it is clearly stated that it is necessary to strengthen the ability to deal with cases with high-risk factors and the number of credits required for courses related to support for high-risk pregnant women, as well as judging and predicting deviations from normal have been increased¹²⁾. With this in mind, it will be necessary to devise ways to interact with and learn from high-risk pregnancy cases even as a part of basic education. Since the contents that students learn change depending on the environment in which they study³⁾, we believe that it is necessary to incorporate practical education at training facilities that handle high-risk pregnancies, such as perinatal maternal and child-care centers. This was also pointed out in the study by Janighorban M, *et al.*¹³⁾. For such high-risk cases that are considered difficult for students to be directly involved with, it is important to provide sufficient learning, such as shadow training, participation in ward conferences, and involvement in case studies.

Limitations of this study

The validity of the evaluation items for antenatal care skills was confirmed. However, generalization is problematic due to low number of questionnaires received. In addition, educational institutions were the only focus of this study and it cannot be denied that is a limitation. In the future, it will be necessary to include the insights of clinical sites to raise the level of midwifery student capabilities, and clarify important differences between education and clinical practice.

CONCLUSION

The results of this study clarified that there is no difference between antenatal care skills considered necessary and attainment level based on educational curriculum. Nevertheless, regarding support for high-risk pregnancy and fetal abnormality cases, the level of attainment required is low and it will be necessary to devise more effective learning programs.

CONFLICT OF INTEREST

The author declares no conflict of interest relevant to this article.

ETHICAL CONSIDERATION

The study protocol was approved by the Ethics Committee of the Kobe City College of Nursing (18219-09).

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