

A descriptive study of student incident characteristics during birth assistance practical training: an educational perspective

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Abstract

The present study was performed to clarify the characteristics of midwifery student incidents experienced by educators during birth assistance practical training and obtain suggestions for teaching methods. Semi-structured interviews were conducted with 11 midwifery educators. Content analysis was conducted for events described by educators as incidents in student practical training settings. In total, 53 situational events were extracted from 978 recording units described as student incidents during midwifery student birth assistance practical training. Three categories and nine subcategories were identified through the analysis. The following were the categories of incident characteristics: 1) developing knowledge and skills for birth assistance; 2) lack of basic competency as a healthcare provider; and 3) fluctuating suitability for midwifery. Subcategories included difficulty using information, lack of risk prediction, lack of clarity of knowledge, underdeveloped skills, unestablished awareness as a member of the team, insufficient interpersonal skills, lack of ethical considerations, difficulty in management of own physical condition, and reality shock. The characteristics of midwifery student incidents associated with birth assistance practical training were affected by the [the lack of basic competency as a healthcare provider] . Incidents arose from [developing knowledge and skills for birth assistance] . This was caused by [fluctuating suitability for midwifery] associated with experiences of midwifery procedures, such as birth assistance, the gap between training and reality, and the occupational aspiration to become a midwife. The results indicated the need for improvement in teaching methods in both educational and clinical settings. In-school teaching requires a practical training environment, including teaching materials and methods that replicate clinical situations, to promote students' acquisition of skills for safe care practice in situations of excessive stress and urgency. In clinical training, stepwise and specific education including safety management is required. This may include enhancement of students' awareness as a healthcare team member, human relationship development, compliance with ethical behavior, and promotion of students' independent engagement in problem-solving and risk prediction.

KEY WORDS

Incidents, characteristics, practical training, birth assistance, educational perspective, qualitative research

Introduction

In Japan, an obstetric compensation system was initiated in 2009 to provide aid for infants injured in birth-related medical accidents and for their family members as a means for early settlement of disputes. The 43rd Annual Report of the Project to Collect Medical Near-Miss/ Adverse Event Information indicated an increasing trend

in reported medical accidents, with 1,265 events in 2005, 3,049 events in 2013, and 2,549 events in the first nine months of 2015¹⁾ . This suggests that it is also necessary to improve medical safety education in midwifery education.

Obstetrician shortages, consolidation of obstetric facilities, and increase in maternal age imply that there is an increasing number of pregnant women at high

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risk in Japan. Consequently, midwives need to be highly competent in obstetric diagnosis and need to have a high level of midwifery skills. Birth assistance skills are midwifery skills that facilitate safe delivery for the mother and child. These skills also enable midwifery students to cope with high levels of stress when the lives of the mother and child are at risk. Therefore, in midwifery education in Japan, practical training for birth assistance is an important and required skill. Practical training of assistance in approximately ten births is required in the midwifery curriculum, accounting for a large part of basic midwifery education²⁾. However, at present, the level of intrapartum midwifery processes attained in formal midwifery education is mostly at the level of “being able to act with guidance” rather than being able to act independently³⁾. In the UK, most pregnant women who are involved in practical training accept the student, although a lack of leadership has been noted to result in refusal of the student⁴⁾. In Japan, pregnant women involved in training tended to show hesitation during care⁵⁾ but a positive response after⁶⁾. However, there have been recent cases where a pregnant woman refuses birth assistance from a student.

Although the safety management of nursing students has been investigated, there are few studies of safety management of midwifery students. One available study indicated that the most common situation wherein nursing student incidents occur is during delivery⁷⁾. The basic procedures involving birth assistance skills are acquired along with birth assistance experiences; however, a lack of skills to appropriately respond to the delivery when it deviated from a normal process and an insufficient attention to maternal and child from a perspective of ensuring safety are observed⁸⁾. Ishimura et al. (2015) reported that in midwifery practical training, most students experienced a state of powerlessness⁹⁾. However, during clinical practice, incidents were detected by the students themselves in approximately 30% of cases and by the supervisors or educators in more than 60% of cases¹⁰⁾. This suggests many students do not recognize an abnormal course of delivery by themselves. Therefore, it is worth clarifying the actual state of student incidents related to birth assistance experienced by educators responsible for midwifery practical training. This may help identify the educational content required to improve safety management teaching methods and reconstruct an

effective support system for midwifery practical training.

The purpose of the present study was to clarify the status and characteristics of midwifery student incidents experienced by educators during teaching situations involving birth assistance practical training. An additional aim was to obtain suggestions to inform future teaching methods.

Methods

Study Design

The present study used a qualitative descriptive design involving content analysis¹¹⁾. The value of qualitative description lies not only the knowledge generated, but also as a vehicle for practice change (Sandelowski, 2010)¹²⁾. A qualitative descriptive design using a content analysis was used to generate information about the complexities of perspectives and behaviors.

Operational Definitions

Incidents: Events in which inappropriate action during birth assistance affects the patient but does not cause symptoms or injury. An incident is also called a near-miss. Incidents include experiences in which an inappropriate action did not affect the patient but caused a ‘fright (brief moment of tense feeling due to fear that the one might have taken a wrong action, for example)’ or “surprise (sobering experience in the similar situation as “fright”)’.

Birth assistance practical training: Practical training in birth assistance skills performed as a requirement of the Japanese midwifery curriculum.

Characteristics: The characteristics of student incidents associated with birth assistance.

Participants

Eleven midwifery educators consented to participate in individual interviews from March 15 to June 15, 2014. The educators were provided with written and verbal information about the study. A snowball sampling method was used to select midwifery educators at individual facilities through referral from acquaintances or previously referred educators. Eligible midwifery educators were required to have experience of coordinating and supervising practical training. In Japanese midwifery education, basic training of birth assistance skills and safety management must be completed before birth assistance practical training. During birth assistance practical training, students receive guidance from an educator or a supervisor at the facility where the practical

training is performed.

Data collection

Data were collected in semi-structured interviews, covering the actual state of student incidents in teaching situations during birth assistance practical training. Interviews were conducted in a private room, lasting 44 minutes on average per person. Two participants did not consent to audio recording for their interviews, and notes were taken during those interviews.

The interview content covered the educators' experiences while coordinating and supervising midwifery practical training, including questions such as "Have you ever experienced incidents caused by a student?"; "What happened in such incidents?"; and "How was the incident dealt with?" Participants were asked to talk about each incident in as much detail as possible. Information on participant attributes, midwifery education experience, the number of students trained, and years of experience in hospital nursing managerial positions were also collected in the interviews.

Ethical considerations

This study was approved by the Kanazawa University Ethics Committee (Approval number: 493) and Kanazawa Medical University Ethics Committee for Epidemiologic Research (Approval number:204) . The interview were conducted after clarifying the research purpose and method to the educational institutions' authorities and educators. Personal information was protected by anonymous responses and individual returning of responses by mail. Voluntary participation in the study was respected. Participants were free to abandon participation at any time, and there were no penalties in declining participation. Participants understood that data would not be used for any purpose other than this study. These parameters were explained in writing, and participants then consented to the study.

Data analysis

The information obtained in the interviews was analyzed using Berelson's method¹³⁾ of content analysis. Incident content was defined as sampling units. Separate analyzable portions of these sampling units were defined as recording units, and symbols used to characterize each recording unit were defined as context units. Similar content was summarized and then underwent content

analysis by two researchers, who coded and categorized the data.

We used comparative analysis to examine other similar/opposite examples. The data control the further sampling and this means that data analysis and sampling are done concurrently. It is variation according to the emerging categories, rather than phenomenal variation or any other kind of variations described earlier (Coyne IT, 1997)¹⁴⁾ .Once themes were identified and data saturation was achieved, the interviews were discontinued (Elo & Kyngas, 2008)¹⁵⁾ .

To test the reliability of the categories, 50% of recording units were randomly extracted and classified independently by a midwifery researcher, after which, consistency was calculated using Scott's method¹⁶⁾ . Reliability was confirmed by a score of 70% or more, in accordance with Funashima¹⁷⁾ .

Rigor

All processes, from establishing the study themes to analyzing data, were constantly supervised by an educator with expertise in qualitative research and teaching experience in areas relevant to the study themes. This ensured clarity, reliability, applicability, consistency, and validity of the study process¹⁸⁾ .

Results

1. Participant characteristics

Participants were 11 midwifery educators aged 20s to 60s, with 2-21 years of experience in midwifery education (Table 1) . Three participants had experience in hospital nursing managerial positions. The current educational institutions were universities for nine participants and vocational schools for two participants.

Table 1. Participating educator' profiles

Participant	Age (Years)	Affiliation	Position	Experience: Teaching (Years)	Experience: Managerial position (Years)
A	20	Undergrad.	Assistant Prof.	2	0
B	40	Undergrad.	Assistant Prof.	6	3
C	40	Occ. College	Subhead	4	2
D	40	Undergrad.	Lecturer	5	0
E	40	Undergrad.	Assistant Prof.	5	0
F	50	Undergrad.	Assistant Prof.	5	0
G	50	Undergrad.	Assistant Prof.	2	0
H	50	Occ.College	Full-time teacher	21	0
I	50	Undergrad.	Lecturer	4	0
J	60	Undergrad.	Associate Prof.	17	4
K	60	Undergrad.	Professor	17	0

2. Analysis of student incidents associated with birth assistance practical training

In total, 978 recording units and 53 situational events were extracted. As shown in Table 2, three categories and nine subcategories were identified for incident characteristics. Categories are shown in square brackets [], subcategories in angled brackets <>, examples in

italics, and participants in parentheses (). The level of consistency in the category classification was 75.6%.

1) Incident characteristics

Category I: [Developing knowledge and skills for birth assistance]

This category included content involving the underdevelopment of skills or lack of knowledge for birth

Table 2 Incident characteristics

Total number: 53 events, study participants: A - K

Category	Subcategory	Experienced event (student behavior)
Developing knowledge and skills for birth assistance	Difficulty using information (9 events)	The students knew about fetal bradycardia but did not notice it in the fetal heart tone. (C) (E) (F) (G) (I) (J) The students did not know how to treat the abnormal bleeding during the first stage of labor. (F) (I) Despite knowing about the delivery process, the student did not know when the pregnant woman should be admitted to the delivery room and was unable to follow the instructions of the midwife. (I)
	Lack of risk prediction (11 events)	Vacuum extraction was required due to prolonged labor. Consequently the students were unable to assist and discontinued assisting the mother. (C) (F) During the first stage of labor, delivery progressed on the toilet, and the infant looked like it was going to be delivered. (D) Labor progressed rapidly, and the infant was about to be delivered on the ward bed. (A) (D) (E) (J) Atonic hemorrhage occurred, which was difficult to treat and the student just stood there dumbfounded. (F) Upon delivery, the infant showed evidence of asphyxia grade I, and the student discontinued assisting the mother. (E) (F) (K)
	Lack of clarity of knowledge (4 events)	The student could not answer question of the labor inducing drug. (H) The student cut the umbilical cord on the infant's side of the umbilical clip during omphalectomy. (K) The students gave wrong (vague) information to the parturient woman. (E) (G)
	Underdeveloped skills (10 events)	The students removed their hand protecting the perineum during birth assistance. (G) (H) When placing the infant on the weighing scale, the infant moved, and the student almost dropped the infant. (I) (K) The perineum received 4th degree lacerations. (C) (E) A blackout occurred, and the student was unable to use the traube stethoscope. (J) When performing omphalectomy, it was difficult to ligate with the umbilical clip, and ligation was achieved with a band; however, it was loose, and the baby bled through the umbilical cord. (H) On performing omphalectomy, the student scratched the infant's skin when placing the umbilical clip. (H) The student could not perform perineal protection and breathing control well, and the infant had facial congestion. (H)
Lack of basic competency as a healthcare provider	Unestablished awareness as a member of the team (7 events)	The student provided care at her own discretion without consulting the midwife. (B) The student almost forgot to convey that gauze had been left in the vagina. (C) The student almost performed an internal examination in the absence of the midwife. (A) The students did not convey information that they had to the midwife. (E) (F) (G) Incident during practical training was not reported to the educator. (D)
	Insufficient interpersonal skills (5 events)	The students did not develop a relationship with advisory staff. (A) (G) (K) A relationship could not be developed with the perinatal women. (D) (I)
	Lack of ethical considerations (2 events)	The student gave priority to their own skills and actions rather than consideration of the perinatal women. (J) The student continued the internal examination regardless of complaint of pain. (K)
	Difficulty in management of own physical condition (3 event)	During birth assistance, the student's physical condition deteriorated and she left on the spot. (D) When the first stage of labor was long, the students were unable to manage their own physical condition. (E) (I)
fluctuating aptitude for midwife	Reality shock (2 events)	The student was unable to tolerate the sight of blood and discontinued assisting with the birth. (G) The student was unable to look at and remain by the side of the woman enduring the labor pains. (K)

assistance.

Subcategory: <Difficulty using information>

This subcategory reflects the cases where students were able to recognize abnormalities, such as signs of fetal bradycardia and hemorrhage, but were unable to judge how the abnormality should be diagnosed.

The student placed a fetal heart rate monitor in the first stage of labor, which made them overconfident. Despite noticing that the fetal heart rate had dropped (bradycardia), the student did not seem to know how far a drop was considered an abnormality. Despite knowing about bradycardia, they did not make the connection to actually respond. (J)

With regard to the pregnant woman bleeding in first stage of labor, in terms of abnormal bleeding, although the student knew that it was a sign of premature separation of the placenta, the student was unable to fathom that the woman's bleeding could actually be abnormal and thus was not able to realize that it was an abnormality. (F)

Subcategory: <Lack of risk prediction>

This subcategory includes content related to the determination of rapid delivery progression and deviation from normal delivery process.

Vacuum extraction was required due to a low fetal heart rate caused by prolonged labor. The student was unable to assist, did not speak to the mother, and discontinued assisting with the birth. (F)

During the first stage of labor, the student was performed well as far as encouraging the pregnant woman to urinate to promote the progression of labor was concerned. However, labor subsequently progressed rapidly, and while on the toilet, the woman felt the urge to bear down and the infant looked like it would be delivered; then, the supervisor noticed and moved the woman to the delivery room in a rush. (D)

Subcategory: <Lack of clarity of knowledge>

This subcategory reflects the content where students were unable to make judgments or act reliably because of a lack of knowledge.

While the process of observation in the induction of labor, some students could not answer the question of the judge of increasing the volume of oxytocin from the instructor. (H)

After infant delivery, the student cut the umbilical cord on the infant's side of the umbilical clip during omphalectomy. The student had not made any mistake

like this during in-school training but just did this impulsively. The supervisor was next to the student and responded quickly after pointing out the error, and thus, there was almost no bleeding, and the infant was barely affected. (K)

Subcategory: <Underdeveloped skills>

This subcategory includes content involving the underdevelopment of birth assistance skills.

She removed her hand and thus could not protect the perineum during birth assistance. She cannot continue protecting the perineum while doing something else simultaneously, for example, (she should be) preparing objects while labor was progressing or moving the hands while talking to the pregnant woman. (G)

The student was not holding the infant well, and when measuring the birth weight by placing the infant on the weight scale, the student overlooked that there was amniotic fluid present on the scale, which made the student's hands slip and almost dropped the infant. (I)

Category 2: [The lack of basic competency as a healthcare provider]

This category included content reflecting inadequate construction of relationships and responses as a part of the basic nursing care practice.

Subcategory: < Unestablished awareness as a member of the team >

This subcategory reflects the content where student guidance and a delay in reporting led to incidents.

The student provided health guidance without consulting the midwife and did not follow hospital protocol. (B)

After delivery, the student was instructed by the obstetrician to take out the gauze inside the vagina later; the student forgot to convey this to the nurse and reported that she realized this afterwards. (C)

Subcategory: < Insufficient interpersonal skills >

This subcategory reflects the content where poor interpersonal relationships led to incidents.

The student often misinterpreted instructions received, did not verbalize her thoughts despite being instructed several times, and thus did not develop a relationship with the supervisor. (A)

If you do not know how to approach people, you cannot have a conversation, and the patient can only be ascertained from computer information. The student was unable to obtain information through conversation and

thus did not build relationships (with patients) . (I)

Subcategory: <Lack of ethical considerations>

This subcategory reflects the content where students' self-centered behavior led to incidents.

Students focused on themselves and was nervous, despite assisting the pregnant woman in the delivery bed. Although the pregnant woman was watching the student, the student gave priority to their own skills and actions. (J)

During an internal examination, despite the pregnant woman reporting pain, the student continued the internal examination without giving any consideration to the pain. (K)

Subcategory: <Difficulty in management of own physical condition>

This subcategory represented one situation in which the student discontinued assisting with a birth due to her own physical condition.

During birth assistance at night, a student who basically did not have any medical condition discontinued assisting midway due to being in poor physical condition; then, two to three hours later, the student recovered and returned to assist with the birth. (D)

When the first stage of labor prolongs, the mother's physical strength dissipates. There were students who could not manage their own physical condition. (E)

Category 3: [fluctuating suitability for midwife]

This category reflects content involving the characteristics of the individual student.

Subcategory: <Reality shock>

This subcategory reflects the content where circumstances such as subjects' pain and bleeding led to incidents.

The student, by nature, would feel sick on seeing blood, and during the third stage of labor wherein there was a lot of blood loss, the student felt sick and discontinued assisting with the birth midway. (G)

Unable to look at the pregnant woman enduring labor or rest by her side to give a massage, the student left the area. The student was also at a loss about whether or not to continue midwifery. (K)

2) Structure derived from the categories

The characteristics of midwifery student incidents associated with birth assistance practical training were affected by the [the lack of basic competency as a healthcare provider] . Incidents arose from [developing knowledge and skills for birth assistance] . At the root of

this was [fluctuating suitability for midwife] associated with experiences of midwifery procedures, such as birth assistance, arising the gap between reality, and the occupational aspiration to become a midwife.

Discussion

The present study yielded suggestions for birth assistance education based on three student incident characteristics during birth assistance practical training.

The findings highlighted that the knowledge acquired in formal education was not directly linked to the significance and gravity of actual events that occur in clinical practice. The category [developing knowledge and skills for birth assistance] included the previously reported characteristics of <underdeveloped skills> and <lack of clarity of knowledge>⁵⁾ , in addition to <difficulty using information> and <lack of risk prediction>. Despite having knowledge, incidents may easily occur when students have no sense of the actual clinical setting, unless they are able to clearly envisage situations. Tense situations during delivery can be highly stressful for students and may result in them freezing up. Midwifery education in Japan involves school-based seminars and skill tests for birth assistance and then practical training. However, to obtain a realistic understanding, it may be easier to use an inductive learning style that involves on-site field trips before practical training. Furthermore, when practicing with a dummy, if points that differ from reality are thoroughly explained and teaching materials are as realistic as possible, students may be better able respond correctly in stressful or urgent situations. Objective, structured clinical examinations, for example, can be useful to create such situations. This may give students self-confidence that will support them in safely exercising their learned skills in any situation. Medical safety education aims to foster the ability to recognize risks and develop judgment skills to avoid risks in nursing practices and techniques¹⁹⁾ . During delivery, a pregnant woman's condition can easily change. Care should be flexible, and skills, such as observation to detect changes in the pregnant woman and accurate prediction of delivery progress, are important. Students have a desire for opportunities to use their knowledge and abilities when putting nursing care into practice. Pregnant women expect a good leadership qualities in student supervisors⁴⁾ . Students' risk prediction competency should

also be improved through practical training. This could involve accompanying midwives in clinical settings as they can provide observational points for students on risk avoidance in that particular time and place; this may also help students learn safety points that they were unable to identify by themselves.

In the incident characteristic [the lack of basic competency as a healthcare provider], irrespective of the achieved <risk prediction>, risks may not be accurately predicted if the student has <unestablished awareness as a member of the team>. Communication within the healthcare team, such as informing or reporting, often clarifies the progress of care planning and nursing problems and can be an opportunity to obtain advice from the team members. Students should be made aware of team care medical practice and taught the importance of accurate reporting (including timing and methods) in nursing care. Amano et al.²¹⁾ noted that inappropriate action based on negative feelings was a factor that led to incidents, and smooth communication was important to inhibit incidents²²⁾. A previous study reported that a psychosocial characteristic of students was difficulty conveying what they were thinking due to a lack of self-confidence²³⁾. Furthermore, <insufficient interpersonal skills> contributed to the student being unable to build relationships with the patient, supervisor, and educator. Another student characteristic extracted was a <lack of ethical considerations> wherein students prioritized themselves over taking into consideration the condition of perinatal women. As key clinical competency that midwifery students need to develop is to focus on the significance of the words and actions of the pregnant woman and respond ethically, or in other words, to have ethical sensitivity²⁴⁾. However, students experience a great deal of stress and anxiety during practical training. For students to display their strengths, we believe that it is important for educators to provide reassurance. Educators share the clinical training site with the students, and thus, it is important to create an environment where techniques can be performed at ease. Educators should closely work with the on-site supervisor, and they should together support the students. Therefore, we believe that in-school teaching methods should include creating opportunities for students to reflect on whether their words and actions were appropriate whether they reacted with ethical sensitivity. They should also be taught to present cases of

medical accidents and consider the ethical actions needed to avoid accidents. Teaching should also provide students with opportunities to experience situations wherein such decisions have to be made spontaneously and the problems should not be foreseen. In addition, when focusing on safety in birth assistance practical training, setting-specific, progressive goals may give students a sense of achievement and help detect issues early. Participants in the present study reported that students had <difficulty in management of own physical condition>. At present, the practical training of midwifery students is based on a concentrated curriculum involving a 24-hour on-call system, meaning students must attend a delivery at any time. It is understandable that students do not want to miss a valuable opportunity to assist with birth. However, students need to be continuously reminded that how they manage their own physical condition may affect the patient.

The characteristic [fluctuating suitability for midwife] incorporated the underlying individual characteristics of the students and the reality of birth assistance, which indicates why <reality shock> occurred. In a process from an occupational aspiration to become a midwife to experiences of midwifery practices, there may be a gap between one's self-image and oneself in reality²⁵⁾. This gap may be decreased by acquiring the means to cope with specific problems²⁶⁾; that is, by being able to autonomously eliminate problems or by being reminded that as a student, they are only midway toward their goal. A student's psychological status should be ascertained, and relevant information should be shared with supervisors so that students do not lose self-respect and put positive relationships into practice.

Limitations and Future Suggestions

A limitation of the present study was the small sample size, thus the results could not be generalized. Furthermore, in the present study, student incident characteristics were seen from the perspective of the educator; however, the underlying causes of the incidents should also be examined from the students' perspective. Further studies are needed to examine different midwifery curricula, analyze incident situations according to the number of birth assistance cases, and investigate the incidence of night-time incidents, incident handling methods, and recurrent situations after incidents.

Conclusions

The characteristics of midwifery student incidents during birth assistance practical training were affected by a lack of basic competency on the part of healthcare providers during basic nursing care. Incidents arose from situations involving the lack of learning knowledge and skills for birth assistance. This was caused by fluctuating suitability for midwife associated with experiences of midwifery procedures, such as birth assistance, the gap between training and reality, and the occupational aspiration to become a midwife.

This was because a midwifery student's experiences of midwifery procedures (such as birth assistance) may not have aligned with the students' occupational aspiration to become a midwife. These characteristics suggest that realistic teaching materials and methods

closely aligned with the practical training environment should be developed. Teaching methods that help students develop safe skills to cope in stressful and urgent situations should also be established. Furthermore, on-site practical training should strengthen students' awareness that they are part of a team, encouraging relationship with surrounding individuals, ethically sensitive behavior, independent problem solving, and risk prediction. Specific safety management skills should be fostered in a stepwise manner.

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分娩介助実習における教育視点から考える学生のインシデント 特性に関する記述的研究

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要 旨

本研究は、助産学生の分娩介助実習における指導場面で、教員が体験した学生のインシデント特性を明らかにし、教育上の示唆を得ることを目的とした。助産学教員 11 名に半構造化面接を実施し、学生の実習場面から教員がインシデントとして語った事象を内容分析した。その結果、助産学生の分娩介助実習において、教員が体験した学生のインシデントとして語られた 978 記録単位は、53 状況的事象として抽出された。その事象からインシデント特性は、「情報の活用困難」「危険性予測の欠如」「知識の曖昧さ」「技術の未熟」「チームの一員としての意識の未確立」「対人関係の不得手」「倫理的配慮の欠如」「体調管理困難」「リアリティショック」の 9 サブカテゴリーであり、看護の基礎としての【ケア提供者としての基礎的な能力の欠如】が影響し、【分娩介助の学習途上の知識・技術】であるという状況から起こっていた。その根底に、助産師という職業の憧れと分娩介助という助産業務の難しさを体感することで【適性に対するゆらぎ】を抱えていたという 3 カテゴリーが抽出された。その特性を踏まえ、学内演習では実習環境と類似した臨場感のある演習方法と教材選択の工夫と過緊張や焦りという場面でも安全な技術が提供できる教育方法の検討や、臨地実習では、チーム意識の強化、関係性の構築や倫理的行動の遵守、学生自らの主体的な問題解決の促進、危険性予測の提示が必要であり、段階的で具体的な安全管理能力の育成の必要性が示唆された。