

Content validity and utility of a proposed safety management education model for birth assistance in midwifery clinical practice

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Content validity and utility of a proposed safety management education model for birth assistance in midwifery clinical practice

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Abstract

Purpose: This study was performed to develop an educational model of safety management in midwifery clinical practice for midwifery students and to examine the content validity and utility of this model.

Methods: A provisional four-step educational model was developed for teaching safety management skills in birth assistance. First, semi-structured interviews were conducted with birth assistance educators, and elements that they deemed necessary for safety management education were extracted (Step 1). Following Bloom's theory of education, Step 2 served to develop an education model proposal based on the findings obtained in Step 1. In Step 3, 102 birth assistance educators completed a paper survey to evaluate the proposed model's content validity based on a four-point Likert scale to evaluate how well they understood the proposed model. Finally, in Step 4, the proposed model was revised to develop educational model version 1 based on the suggested revisions from survey responses. The content validity and utility of this educational model version 1 were examined by 10 educators, including five new birth assistance educators who replaced five of the originally surveyed educators.

Results: The proposed educational model was composed of six extracted categories. Four categories, "Objectives of safety management education," "Midwife ethics," "Appropriate reporting, communication, and consultation," and "Infection prevention," were set as course outcomes, while the remaining two categories, "Experiences of birth assistance" and "Safety knowledge and techniques," were expressed on a horizontal axis representing five stages of learning and a vertical axis representing the level of growth, respectively. Of the 102 participants that provided valid responses, 88 (86%) "Agreed (including partial revisions)" with the proposed model. Safety management education abilities were clearly defined with reference to opinions on the need for more concrete descriptions of safety management abilities in the proposed model. Furthermore, in response to requests for description of the relationship of safety management with experiences of birth assistance and the sequence of learning in experiences of birth assistance, six stages were added to the axis ranging from understanding of labor and delivery to autonomy. Educational model version 1 was presented with the level of growth on the vertical axis designated as the level of achievement of safety management abilities and representing the interaction of the three domains in Bloom's taxonomy of educational objectives, and the four course outcomes shown as a curve on the axis. All 10 respondents agreed that model version 1 had content validity and was "applicable" in practice.

Conclusion: The results suggested the validity of the content and utility of the proposed safety management education model for birth assistance in midwifery clinical practice.

KEY WORDS

Birth assistance, Safety management, Educational model, Midwifery students, Clinical practice

Introduction

In recent years, structural reorganization to assure medical safety has arisen as an issue. In particular, perinatal management can involve risk to the lives of both mother and child, with situations shifting abruptly from normal to requiring immediate intervention. Therefore,

midwives must assure safety in perinatal medical care and be able to perform birth assistance in place of physicians.¹⁾

Midwifery education varies greatly throughout the world and various levels of midwives exist from direct-entry midwives to postgraduate-educated midwives²⁻³⁾. The number of experiences of birth assistance required to

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graduate from midwifery curricula varies from country to country; 30 in Germany and 50 in Sweden, for example. In Japan, approximately 10 cases of hands-on clinical training in birth assistance, which are required by midwifery curricula, account for a large part of basic midwifery education⁴⁾. However, unlike the other countries, required number of birth assistance experiences as graduation requirements is fewer in Japan. On the other hand, incidents and accidents experienced by students in birth assistance occur most often during “labor,”⁵⁾ and one of the most common concerns among new graduate nurses is “fear of causing a medical error.”⁶⁾ Approximately 20% of those wishing to enter training also mention concerns regarding medical safety. Therefore, the potential for medical errors appears to be a factor related to the high occupational turnover rate.⁷⁾

Reports of previous studies on safety management education in Japan have been gradually increasing since the occurrence of a medical accident in 1999. These include case reports of medical malpractice and accident prevention measures⁸⁻⁹⁾. Meanwhile, many reports in overseas focus on the safety of patients in maternity care¹⁰⁻¹¹⁾ and risk management for home childbirths¹²⁻¹³⁾; however, few studies have been conducted on the safety of midwife-led care for low-risk women¹⁴⁾. Furthermore, the majority of these reports are of midwifery practice after graduation, and reports of basic midwifery education at student level are extremely rare, with the exception of incident report analyses. Consequently, there are no reports on examples of safety management education in midwifery or educational practice drawn by the cases of incidents.

Therefore, this study elucidates educational topics in safety management during birth-assistance clinical training and formulates and evaluates an educational model for

birth assistance that can be introduced into education on a standard basis. Proposing an educational model that allows midwifery students to acquire safety management skills is essential for providing safe birth management; therefore, evaluating content validity and utility of the created model is significant.

Operational definitions of terms

Safety management in birth assistance: Midwifery students’ capacity to practice safe birth assistance care for mother and infant by following the progress of delivery.

Educational model: A description of educational content with a determined course outcome that assists midwifery students in acquiring methods of safe birth-assistance care.

Methods

1. Steps in the formulation of the educational model

The educational model in this study is composed of Steps 1–4, as shown in Figure 1.

Step 1: Extraction of components of the educational model

1) Survey period and subjects

Educational institutions from the Hokuriku and Kansai regions were selected randomly between March 15 and May 30, 2014, and 10 birth-assistance educators who agreed to participate in the study were chosen as subjects.

2) Survey method and analysis

Semi-structured interviews lasting 30–60 minutes were conducted to discover what educators believed necessary for students in safety management education, based on their experience teaching birth assistance. With permission from respondents to record interviews, the audio was then

transcribed in order to extract educational content, with one researcher and two midwifery educators¹⁵⁾ analyzing, codifying, and categorizing it. A qualitative researcher

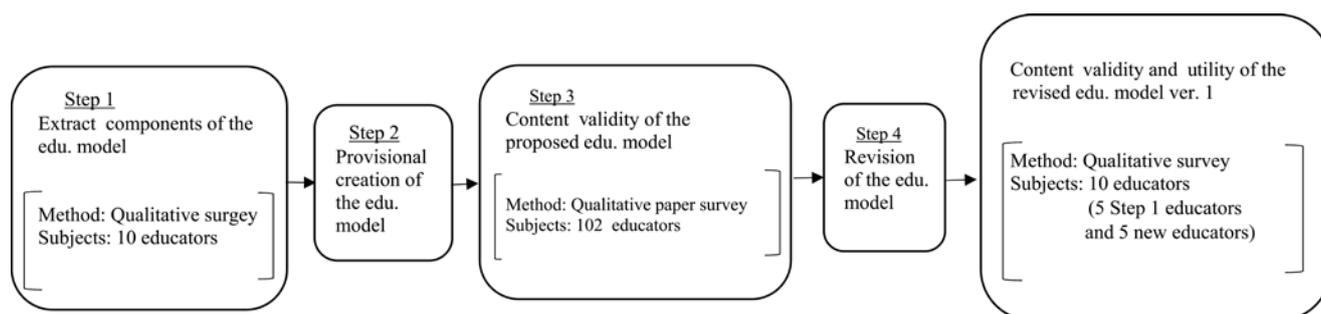


Figure1 Creation of the proposed education model and content validity and utility protocols

supervised the expressions and content collected in this manner.

Step 2: Provisional creation of the educational model

Based on the results of Step 1, Bloom's educational theory,¹⁶⁾ and references from previous studies, one researcher and two birth-assistance educators in safety management outcomes created the proposed educational model.

Step 3: Content validity of the proposed educational model

1) Survey period, subjects, and method

Subjects in this study were 339 midwifery educators in 113 institutions from the Chubu and Kinki areas. They were surveyed between March 20 and April 30, 2015 on the proposed educational model's validity. Respondents were asked to individually complete a free-response questionnaire and return it by mail. Three sheets of questionnaires were mailed to each institution. Respondents were asked to evaluate the validity of the proposed educational model by selecting one of the following statements: '4. Understandable,' '3. Needs partial revision,' '2. Needs major revision,' and '1.

Incomprehensible.' Participants were then asked to explain their answers in free-response. Subjects also evaluated the course outcome's four objectives according to the following four choices: 1) Knowledge only; 2) Can be done in class lectures; 3) Can be done under supervision; and 4) Can be done autonomously.

2) Analysis

The statistical program SPSS22.0 was used for data analysis to produce descriptive statistics. The free-responses' content was summarized.

Step 4: Revision of the educational model

For the educational model in which content validity was verified in Step 3, revisions reflected respondents' opinions.

2. Content validity and utility of the revised educational model version 1

1) Survey period and subjects

In addition to five randomly chosen participants from Step 1 who gave their consent, five new educators from separate educational institutions were recruited using snowball sampling method via introduction of the participants in the previous survey. This survey was conducted between May 10th and June 20th, 2015, for a total of 10 subjects.

2) Survey method and analysis

The researchers presented the revised educational model version 1 individually at locations specified by the participants, and conducted a 30-minute hearing on the utility of the model and potential challenges related to its use. Participants were asked to rate the utility of the model by selecting 'Applicable,' 'Applicable with partial revision,' 'Applicable with major revision,' or 'Not applicable.' A transcript of the content discussed was created, and the content was analyzed by one researcher and two educators¹⁵⁾ under the supervision of a qualitative researcher.

3. Ethical considerations

This study was approved by the Kanazawa University Medical Ethics Committee (Approval number: 493). The interview and questionnaire surveys 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.

Results

1. Steps in the educational model's formulation

Step 1: Extraction of the educational model's components

1) Profiles of survey participants (Table 1)

Ages of the 10 educators in birth assistance ranged from 29 to 62 years, with an average age of 50.6 years (SD = 9.9). The number of years in education ranged from 2 to 21 years, with an average of 8.4 years (SD = 7.1).

2) Extraction of educational content in safety management

Of the 66 situations that as per educators required safety management education through laboratory work, expressions related to aspects of safety were extracted, analyzed, and categorized, with six categories defined.

Categories are shown in brackets [], parts of raw data in quotation marks "", and participants in parentheses ().

Category 1: [Clarification of educational objectives in safety management]

"Points emphasized in safety management differ among

educational institutions” (D,F); “Instructors’ responses to incidents are not standardized” (I,J).

Category 2: [Practical experience in safety management and changes in perceptions associated with experiences of birth assistance]

“In the early stages of birth assistance, everything is learned in class, so they [midwifery students] are unable to correlate knowledge and practice. For example, a student may recognize a symptom as fetal bradycardia, but may not be able to judge how severe the condition is. They can learn to judge only after observing many cases of birth assistance” (B,E,G,H,I); “Safety education should be gradual and follow a certain order, but this is not always respected” (A,D,H); “When delivery progresses suddenly or when a mother almost gives birth in the bathroom, it becomes harder to predict the progress of labor (B,G,F,J), etc.

Category 3: [Ethical responses of midwives]

“Students prioritize their performance or actions over concerns for the patient” (B); “Students cannot form a relationship with the patient or training staff.” (C,F,I,J).

Category 4: [Knowledge and techniques confirmed through hands-on experience]

“Students release the hand protecting the perineum during birth assistance” (A,I); “the perineum is lacerated four times” (G,H); “Students cut the umbilical cord on the infant-side of the umbilical clip during omphalotomy.” (C)

Category 5: [Appropriate reporting, Communicating and consulting]

“Does not report the incident to the instructor” (F); “Performs care without consulting the midwife” (D), etc.

Category 6: [Infection prevention]

“Protocols of handling infections are slightly different

among medical institutions” (E,G); “We must re-educate students on notions of infection prevention that should have been acquired in basic training” (B,D,E).

As shown above, components of the educational model were extracted: Experience in birth assistance; Safety knowledge and techniques; Appropriate reporting, Communication and consultation; Ethical response of the midwife; and Clarification of objectives in safety management education.

Step 2: Provisional creation of the educational model

The provisional model was formulated based on the components in Step 1, Bloom’s theory of education,¹⁶⁾ and reference materials. The six categories extracted in Step 1 comprised four categories set as outcomes (‘Objectives of safety management education,’ ‘Midwife ethics,’ ‘Appropriate reporting, communication and consultation’ and ‘Infection prevention’) and two categories expressed on coordinate axes (‘Experiences of birth assistance’ on the horizontal axis and level of growth including ‘Safety knowledge and techniques’ on the vertical axis).

The model’s vertical axis (Figure 2) illustrates levels of growth in safety management capacities. The basic level refers to understanding knowledge and techniques in birth-assistance clinical practice and the ability to provide basic birth-assistance care. The application level involves ability to recall past occurrences and predict accidents, thereby demonstrating development of sound clinical judgment for executing legal responsibilities.¹⁷⁾ The horizontal axis shows the number of experiences in birth assistance in clinical training. The process by which students progress in their understanding of labour and delivery from their first experience of birth assistance, build relationships with women in labour by their sixth

Table 1 Participating educator’ profiles (Step 1)

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

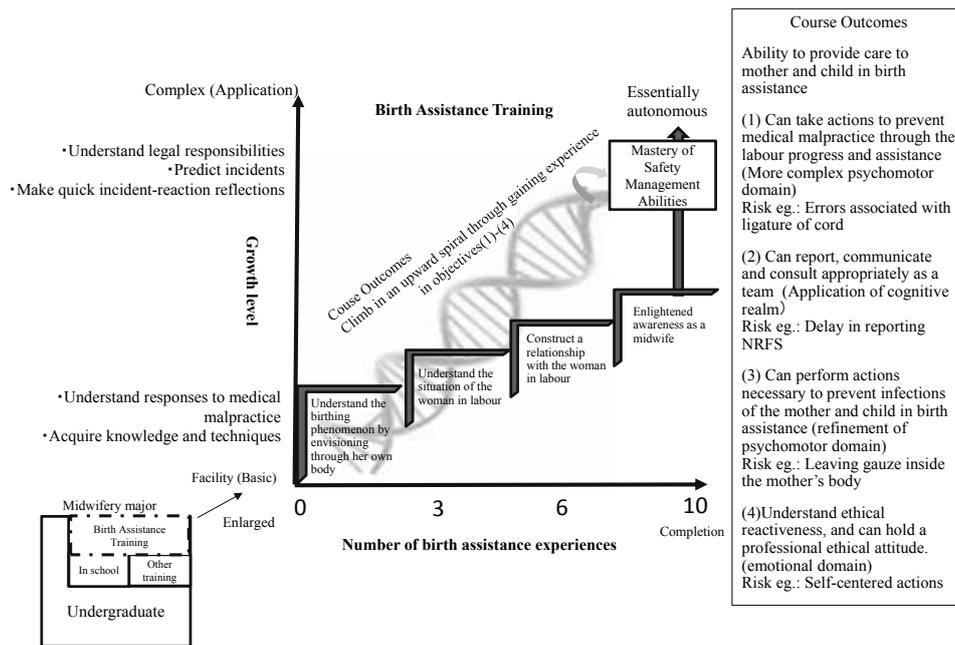


Figure2 Proposed safety management education model in birth assistance

Note. The vertical axis represents the level of growth in safety management skills from the basic level to the application level. The horizontal axis represents the number of experiences of birth assistance in clinical practice. Students develop their skills from understanding the phenomenon of childbirth at the first case of assistance, to gaining a sense of professionalism as a midwife through over 10 cases. By graduation, the target acquisition level of safety management in birth-assistance training was set at “autonomous,” and the course outcome’s four objectives were established. The level of achievement of these four objectives is improved in a spiral as experience is gained. Examples of incidents are also shown for these four objectives.

experience, and awoken as midwives by their tenth experience was shown in five stages¹⁸⁾.

By graduation, the target acquisition level of safety management in birth assistance was set at ‘autonomous,’ and the four course outcomes were established taking into account the four categories in Step 1. The four objectives were named based on the training guideline for new nurses¹⁹⁾ and “Abilities to provide safe care,” the achievement objectives for graduation from nursing universities.²⁰⁾ As Rogers stated,²¹⁾ the spiral exercises of learning were incorporated, as well as Bloom’s corresponding acquisition goal levels.¹⁶⁾ Records on students’ incidents are presented in Figure 2.

Step 3: Content validity of the proposed educational model

From participants, 102 valid responses were received to the paper survey (Table 2). Respondents’ ages ranged from 27 to 67, and the average age was 45.6 years (SD = 12.1). No significant difference in understanding or validity of the model content was seen in any of the items on attributes.

Of the 102 respondents, 88 (86.0%) responded that it

Table 2 Profiles of participants in the survey (Step 3)

Category	n=102		
	n	(%)	
Age	20-29 years	2 (2.0)	
	30-39 years	22 (21.6)	
	40-49 years	37 (36.3)	
	50-59 years	28 (27.5)	
	60 or above	10 (9.8)	
	Unknown	3 (2.9)	
Position title	Full-time teacher	15 (14.7)	
	Curriculum coordinator	10 (9.8)	
	Clinical training Monitor	3 (2.9)	
	Professor	28 (27.5)	
	Lecturer	18 (17.6)	
	Associate professor	11 (10.8)	
	Professor	11 (10.8)	
	Other	6 (5.9)	
Background in nursing education	University	39 (38.2)	
	2-3 year College	12 (11.8)	
	Advanced vocational school	49 (48.0)	
	Major in high school	2 (2.0)	
Background in midwifery education	Graduate	5 (4.9)	
	Major in university	4 (3.9)	
	Undergraduate	22 (21.6)	
	Major in 2-3 year college	24 (23.5)	
Advanced vocational school	47 (46.1)		
	Years of experience in the field	5 years or less	24 (23.5)
		6-10 years	31 (30.4)
		11-20 years	31 (30.4)
21 or more		14 (13.7)	
Unknown		2 (2.0)	
Degree obtained	Doctorate	25 (24.5)	
	Masters	46 (45.1)	
	Bachelors	15 (14.7)	
	Associates	1 (1.0)	
	Other	15 (14.7)	
Current educational institution	Graduate	20 (19.6)	
	Major in university	12 (11.8)	
	University	41 (40.2)	
	Other program in university	2 (2.0)	
	Major in 2-3 year college	3 (2.9)	
	Advanced vocational school	22 (21.6)	
	Other	2 (2.0)	

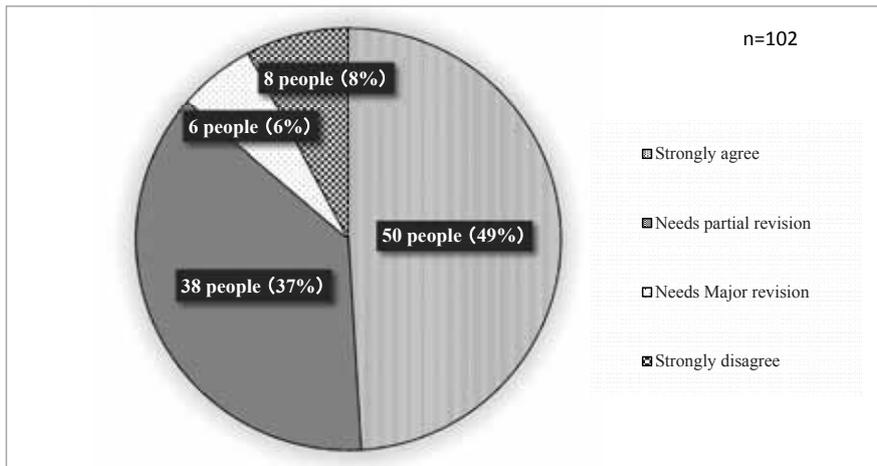


Figure 3 Level of understanding of the provisional educational model

was understandable, or understandable if partially revised, with the content of the proposed model presented in Figure 3.

Fourteen respondents (13.7%) replied that the model “Needs major revision” or that they “Strongly disagree[d].” Respondents’ reasons for selecting ‘Need partial revision,’ ‘Needs major revision’ or ‘Incomprehensible’ were summarised in the following 4 points: (1) the definition of safety management skills, (2) the level of growth in safety management skills, (3) the level of experience in birth assistance, and (4) course outcomes, the details of which are discussed below.

Regarding 1) safety management abilities, participants responded that they “wanted specific descriptions.” With regard to 2) growth level, they wrote that “Full acquisition is difficult with just 10 cases of birth assistance”

and that “Working autonomously is almost impossible.” In terms of growth levels, they asked, “Is it growth or mastery?” Regarding questions about the coexistence of safety management, experience in birth assistance, understanding of legal responsibilities, and how to handle malpractice incidents, respondents’ answers were divided between “it is easy” and “it is difficult.” Regarding the prediction of labor progress and risk and accidents, participants responded, “Acquisition is difficult in basic education alone.” In terms of 3) stages of birth-assistance experience, many commented, “Progress does not always follow this order” and ‘I would like the relationship with safety management abilities to be explained’. On the subject of 4) course outcomes, respondents wrote, “There is a range of types of actions to prevent medical malpractice.” Further, they “experience discomfort in the

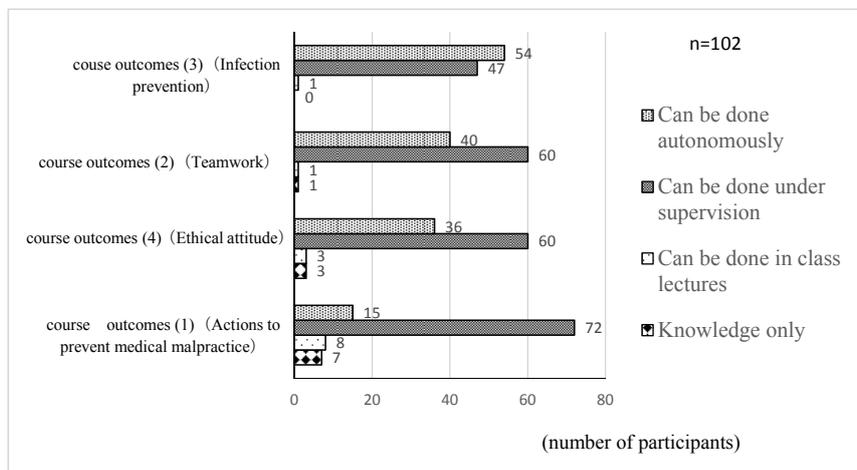


Figure 4 Course outcomes: Current achievement levels of the four goals

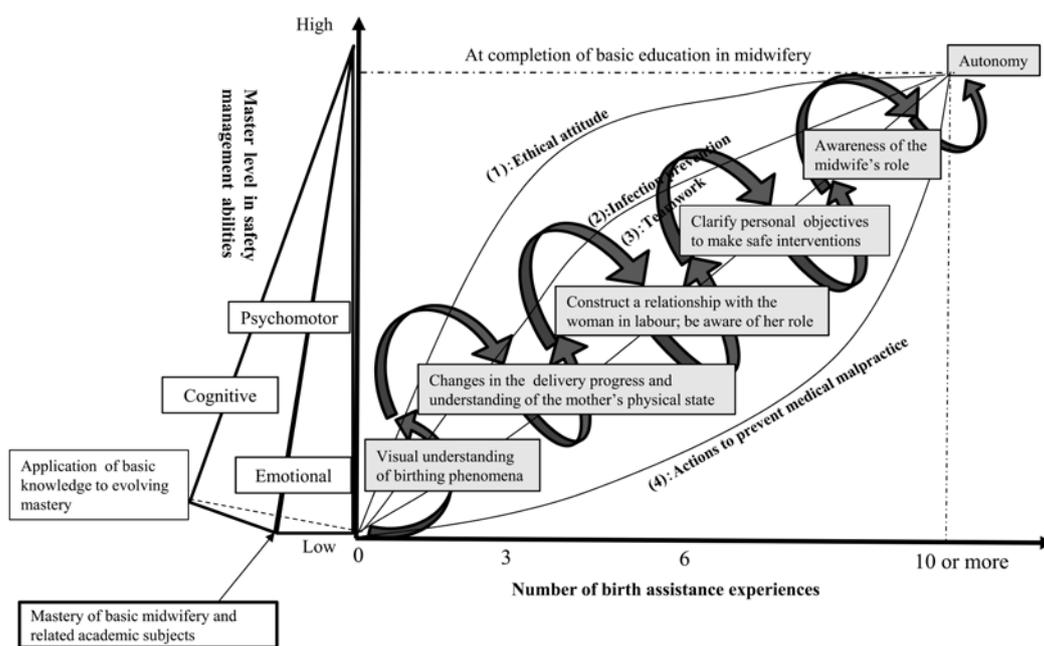


Figure 5 Safety management educational model in birth assistance ver.1

Note. Safety management in this model is the ability to practice with an awareness of the safe delivery of an infant and to provide necessary care. The vertical axis represents the acquisition level of safety management skills. The safety management ability grows skills from the basic level to the application level. The cognitive, psychomotor and emotional domains act synergistically in this acquisition. The horizontal axis represents the number of experiences in birth assistance. Autonomy is achieved in conjunction with the acquisition of safety management skills over five stages. Upward and downward movements in growth are indicated by \Rightarrow . As the desired course outcome is the ability to give safe birth assistance to mother and child, the goals of 1) ethical attitude; 2) infection prevention; 3) teamwork; and 4) actions to prevent medical malpractice were chosen. Improvements in these four objectives with gained experience are shown as curves in a spiral. The gradients of curves (1) to (4) indicate the degree of achievement of safety management toward autonomy and the number of cases of birth assistance. The dotted lines on the vertical and horizontal axes represent the time of completion of basic midwifery education and the 10 cases of birth assistance specified in the regulations of midwifery requirements.

lack of emphasis on anything but infection prevention.”

Figure 4 shows the current level of acquisition of students on the four items under course outcome. For these items, the highest number of responses was seen in “Can be done autonomously,” was highest in infection prevention at 53% and lowest (15%) in actions to prevent medical malpractice. In terms of items that “Can be done under supervision,” the greatest number of responses in order was: 1) Actions to prevent medical malpractice; 2) teamwork; 3) ethical attitude; and 4) infection prevention.

Step 4: Revision of the educational model

According to the results in Step 3, the educational model was revised. The birth assistance safety management educational model 1 is shown in Figure 5. The main points of revision are shown in 1) –4) below.

1) The delivery of the child and the ability to practice necessary care with awareness of safety were added to the definition of safety management abilities.

2) The term “growth” in the expression “growth level of safety management abilities” was changed to “acquisition.”

We also added that the acquisition level would be influenced synergistically by three domains—cognitive, affective, and psychomotor—in a pyramid relationship as theorized in Bloom’s taxonomy of educational objectives.¹⁶⁾

3) We made another change in wording from “learning associated with the number of birth-assistance cases experienced” to an expression that better describes acquisition of safety management abilities. Steps to autonomy were revised into a six-stage process.

4) The relationship between course outcomes and the level of achievement in safety management/ experiences of birth assistance was more clearly described for better understandings, and the level of achievement of course outcomes was presented as a curve line.

These revisions to the proposed model show how midwifery students complete basic midwifery training and related subjects, acquire safety management skills through hands-on training in birth assistance, and evolve from having basic knowledge to applying and further

Table 3 Participating educator' profiles (Evaluation of revised model ver.1)

Participant	Experience: Teaching (Years)	Age (Years)	Affiliation	Position	Experience: Managerial position (Years)	Notes
K	35	60	Undergrad. Other department	Professor	0	
L	30	60	Graduate	Professor	0	
A	21	50	Occ.College	Full-time teacher	0	Also participated in Step 1
N	16	50	Graduate	Associate Prof.	0	
D	6	50	Undergrad.	Associate Prof.	3	Also participated in Step 1
F	5	40	Undergrad.	Lecturer	0	Also participated in Step 1
Q	3	40	Undergrad.	Assistant Prof.	4	
I	2	50	Undergrad.	Assistant Prof.	0	Also participated in Step 1
J	2	20	Undergrad.	Assistant Prof.	0	Also participated in Step 1
T	2	30	Undergrad.	Assistant Prof.	0	

developing such knowledge.

The vertical axis (Figure 5) represents safety management abilities. This refers to the midwifery student's capacity to provide appropriate care to mother and child with appropriate knowledge, techniques, and attitude. This ability's mastery is expressed as a synergetic outcome of three domains—the cognitive, affective, and psychomotor.

The level of experience in birth assistance on the vertical axis goes ups and downs, and is developed to the acquisition level of safety management skills through five stages. As the desired course outcome is the ability to give safe birth assistance to mother and child, the goals of 1) ethical attitude; 2) infection prevention; 3) teamwork; and 4) actions to prevent medical malpractice were chosen.

Thus, to achieve autonomous safety management of birth assistance in midwifery clinical practice, course outcomes of safety management were set, and a safety management education model version 1 for birth assistance showing the relationship between experiences of birth assistance and level of achievement of safety management abilities was proposed.

2. Content validity and utility of the revised model version 1

As shown in Table 3, there were 10 survey participants after five more participants were recruited in addition to the five who participated in Step 1. Their ages ranged from 29 to 68 years, and their average age was 50.3 years (SD = 12.5). Years of experience in teaching ranged from

2 to 35 years.

As presented in Table 4, challenges related to the use of the revised educational model version 1 were summarized in the following six categories: "current issues of safety management education," "enhancing students' awareness of safety management," "a need for concrete criteria in evaluating course outcomes," "difficulty of self-directed safety management," "a need for coordination between education and clinical practice," and "devising the ways of acquiring safety management skills."

Among participants who responded that they could "apply the revised educational model," respondents explained, "When safety management objectives are clear, it is easier for professors and instructors to teach as well," "the order of course outcomes can be understood," and "the Safety Management model is also easy for students to apply."

Among those who suggested the need for the model's re-evaluation, some opinions included "need for an instruction method of professors and clinical instructors," "necessity of concrete diagnostic standards of course outcomes," and "the minimum 10-case boundary is thick and presents difficulty in the autonomy of safety management." The educational model as revised above was considered to have content validity by all 10 respondents, and its utility was evaluated as 'Applicable' by five respondents and 'Applicable with partial revision' by five respondents.

Table 4 Opinions to the revised education model ver.1

Category	Opinion	Participant in ()
Current objectives in safety management education	The reality is that it is impossible to keep up with the changes both in birth assistance and safety management (A) The instructor is held responsible for matters related to safety (D) (J) (N) Current midwifery clinical training is protected by instructors (F) (Q) Often, the instructing professors themselves have little clinical experience, which is a problem (K) (N)	
Strengthen students' awareness on safety management	Clinical experiences are very busy, giving little time for students to report and consult instructors, thereby increasing risk factors even further (T) Sometimes I question whether students really pay attention to safety (F) (Q) Even if they notice a problem, some are able to report the problem while others are unable to (J) It is easier for students to apply it into practice by following a structured safety management model (F)	
Need for concrete diagnostic standards on course outcomes	It is easier to understand with concrete examples demonstrating elements of course outcomes (D) Infection prevention is the first of the course outcomes that can be mastered. The order of objectives should also be exactly as shown.(A) It is easier to understand if there are concrete examples of actions to prevent medical malpractice in the course outcomes. (A) I feel discomfort that only infection prevention is mentioned in the course	
Difficulty of demonstrating autonomy in safety management abilities	There is a '10 case boundary' in Japanese birth assistance training, and it is hard to achieve autonomy within it. Abroad, it is set at 20-40 cases, showing a big gap between that of Japan. (K) With just 10 cases of experience in birth assistance, it is impossible to achieve autonomy. This should be expanded to more than 10 cases. (J) (N) (Q)	
Need to streamline education and practice	Development in safety management is only obtained through the effects of knowledge, techniques and attitude, so education and clinical experiences cannot It is easier for the professors and instructors to teach when the safety management objectives are clarified. (H) It is easier to teach when birth assistance fills a bigger share of practical education and is cleared in safety management. (C) It is impossible to help students achieve safety management abilities without shared awareness between the professors (educators) and clinical instructors, so the model should be applied by both parties.(K)	
Creative adjustments to foster mastery of safety management abilities	Once students become confident in their skills, they gain the ability to predict the progress of labour. (A) (I) It is easier for students to envision the outcome when practice and in-class education is repeated alternatively. (Q) Education by participation in conferences is a possibility.(K) Reflection is the most important element of safety management. (A) (J) It is necessary to construct education methods within the larger context of the generalised curriculum. (D)	

Discussion

1. Content validity and utility of the safety management educational model for birth assistance version I

Birth-assistance safety management model ver.1 takes the course outcome objectives of safety management as its goals; as components, it takes the following: 1) the level of experience in birth assistance and 2) the acquisition level of safety management capacity. Overall qualitative evaluation after four-step revisions of the educational model suggested the content validity and utility of the model. To this point, safety management education in midwifery education was provided from each midwifery educational institution's perspective, and the content covered was left to each instructor's discretion. In response to this situation, this educational model offered the opportunity to revise each institution's education in safety management capacities. Course outcomes were especially useful in confirming the achievement level of safety management goals from students' point of view

and instructors' ability to consider midwifery students' stages of experience. Thus, this education model provides groundwork on which relatively standardized, effective methods of teaching can be implemented through various professors and institutions.

The proposed education model presents goals for achievement by the end of basic midwifery education's completion. Therefore, we need to evaluate a framework through which the clinical ladder of mastery of midwife practices²²⁾ can be connected to continued safety management capacity. The application of this model could be very useful in preventing inconsistencies between basic education and the practice demanded in clinical settings.

2. Suggestions for education leading to mastery of safety management abilities

Three educational objectives for application of the safety management education model ver.1 are shown below.

First, the four goals in safety management course outcome need to have concrete judgment standards. In the model's verification in Japan, many commented from

experience that the instructor is a major determinant of whether students can master safety management abilities. Instructors must detect changes that occur from minute to minute in the clinical environment, respond to them simultaneously, all the while modeling safety management for students. When the course outcome is unclear or when a gap opens between students and professors' goals, the purpose of accumulating clinical experience cannot be achieved. In other words, as long as instructors and professors have concrete, common standards, they should be able to lead students through standardized instruction toward achievement of goals in safety management.

Secondly, as per the paper survey in Step 3 and the model evaluation stage, gaining autonomy after completion of basic midwifery education is difficult. Naturally, this role is inherent to midwives with the national midwife certification; therefore, autonomy in safety management abilities should be required. Some reports in overseas have shown that among low-risk births managed by midwives, satisfaction degree is higher and less medical interventions are needed²³⁻²⁴⁾. Midwife autonomy is vital in order to achieve this²⁵⁻²⁶⁾. As many consider achieving this level difficult, the question as to why this gap occurs urgently needs investigation in the near future.

Thirdly, delivery progress prediction aiming to prevent risks and accidents also appeared to be a skill not obtained by completion of basic midwifery education. The importance of predicting the risk has also been indicated from the perspective of patient safety and incident analysis¹⁴⁻²⁷⁻²⁸⁾. In the Japanese Clinical Ladder of Competencies for Midwifery Practice, high-risk care is set at Level 1, which is the competency expected at 2-3 years after commencement of midwifery career²²⁾. According to a study by Sato et. al.,²⁹⁾ students were reported to be "not at all capable" of understanding and acting to respond in abnormal situations. Inevitably, this implies that the gap between competency at graduation and competency in new workers expected at the workplace

is far too great.³⁰⁾ To complement that observation, when new midwives were surveyed on what they wish they could have learned as students, they responded "exposure to progress in abnormal cases" or "knowledge and assessment skills to obstetric risks.³¹⁾ To allow new midwives to work confidently, it is absolutely necessary to construct an educational framework that conjunctively links clinical and educational experiences to promote common understanding of competency levels that should be mastered in safety management.

Limitations of this study and future suggestions

Participants who cooperated in this model's presentation were assumed to be experienced in undergraduate education, and may or may not be part of other graduate-level or vocational schools. It may also be necessary to survey clinical instructors on the degree to which they have introduced the educational model in each intern-hosting institution.

Conclusion

To achieve autonomous safety management of birth assistance in midwifery clinical practice, course outcomes of safety management were set, and a safety management education model for birth assistance showing the relationship between experiences of birth assistance and level of achievement of safety management abilities was proposed. Content validity and utility of this model were suggested through qualitative evaluation.

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助産学実習における分娩介助の安全管理教育モデルの試案と 内容妥当性及び活用性

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要 旨

【目的】本研究の目的は、助産学生の分娩介助実習において安全管理教育モデルを試案し、内容妥当性及び活用性を検討することである。

【方法】分娩介助の安全管理能力を修得する教育モデル試案を、4つのステップから作成した。まず10名の助産教員に半構成面接を行い、安全管理教育に必要であると語られた内容を抽出した(ステップ1)。その内容とブルームの教育理論を基盤に教育モデル試案を作成し(ステップ2)、次に102名の助産教員に質問紙調査を用いてモデル試案の理解できる程度を4段階リカート法で内容妥当性を検討した(ステップ3)。修正を要する意見を参考に、モデル試案を修正して教育モデル ver.1を作成した(ステップ4)。この教育モデル ver.1について、助産教員5名を新たに交替して、10名の教員に内容妥当性・活用性を質的に調査した。

【結果】教育モデル試案は、抽出された6カテゴリーから構成され、安全管理教育目標、助産師の倫理、適切な報告・連絡・相談、感染防止の4カテゴリーは、コースアウトカム目標に設定し、2カテゴリーは、分娩介助例数を横軸にし5段階の学びを表し、安全な知識・技術を含む成長レベルを縦軸とした座標軸で表記した。このモデル試案に対し、102名の有効回答の内88人(86%)は、「(一部修正含む)理解できる」であった。モデル試案に対し、具体的な安全管理能力の記載を求める意見を参考に安全管理能力の定義を明記した。また分娩介助例数の学び方の順序性や分娩介助例数と安全管理との関係性の記載の要望から、軸中に分娩現象の理解から自律までを6段階で示した。さらに縦軸の成長レベルは、安全管理能力修得レベルとしブルームの学習目標の3領域の相互作用を表し、コースアウトカム4目標を軸中に曲線で示す等して、教育モデル ver.1を提示した。そのモデル ver.1に対して、調査協力者10名が内容は妥当であるとし、「活用可能」と支持した。

【結論】助産学実習における分娩介助の安全管理教育モデル試案は、内容妥当性及び活用性が示唆された。