

St. Luke's International University, Graduate School  
Doctoral Dissertation, 2017

**Association of Traumatic Stress Experiences with  
Burnout and Work Engagement Among Midwives**

助産師の心的外傷性ストレス体験と  
バーンアウトおよびワーク・エンゲイジメントとの関連

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## **Chapter I Introduction**

### **1. Background**

Occupational stress, particularly when caused by psychological trauma can be a heavy burden to midwives. How do midwives who have experienced traumatic stress at their workplace carry on with their work? Psychological trauma, which is emotionally draining, is often experienced in unexpected situations, and a traumatic stress experience has serious effects not only on the person but also on the co-workers. Psychological trauma is often similarly likened to the usual trauma, which literally means injuries due to unexpected catastrophic experiences involving a crisis of life regardless of physical or psychological causes.

Women who have successfully managed challenging births have also reported about their own traumatic birth experiences (Simpson & Catling 2016). Midwives whose main delivery mandate is midwifery service also experience some traumatic stress by witnessing sudden changes in newborns and mothers or when assisting in abortions (Salomonsson, Alehagen, & Wijma, 2011; Beck, 2012; Rice & Warland, 2013). Midwives who experienced traumatic stress have been pointed out subsequently to experience deterioration of their mental health such as in cases of post-traumatic stress disorder (PTSD), burnout, and depression (Yoshida & Sandall, 2013). Furthermore, it has been reported that the deterioration of mental health leads to deterioration in the quality of health services to patients as well as early retirement (Leinweber, & Rowe, 2010; Hildingsson, Westlund, & Wiklund, 2013; Sheen, Spiby, & Slade, 2015).

Fumoto and Horiuchi (2014) previously evaluated 681 midwives who had stressful experiences in the past, and investigated their risk of PTSD and their intention of continuing employment after such experiences. Their results showed that 575 (84.4%) midwives experienced traumatic stress. Of these 575 midwives, 79 (57%) midwives were classified as in the PTSD high-risk group, and 86 (15.0%) midwives revealed that they were considering retirement because of their experience.

A decline in labor productivity which is caused by the deterioration of workers' health problems, particularly PTSD, burnout, depression, and other mental health, is

said to occur not only at the time of absence from work but also during work. This is defined as presenteeism and results in a decline of labor performance (Kono, 2009). The problems of absenteeism and presenteeism, which indicate a decline in labor productivity where absenteeism continues, have also recently been attracting much attention in different fields such as occupational health and medical economics. Inaha (2014) investigated the impact of burnout from work on the productivity of nurses. It was found that burnout in nurses advances to a clinical depressive state, resulting in an increase in the loss of work time by 3.5%, and the hospital economic loss is calculated as 12,000 yen in one month per nurse. In addition, the higher the degree of burnout, the more the desire to leave the workplace.

However, traumatic stress experience among midwives does not necessarily lead to a deterioration of their mental health. In contrast, Fumoto and Horiuchi (2014) also found that midwives have achieved growth after experiencing traumatic stress. Tedeschi and Calhoun (2004) defined “the experience of positive change that occurs as a result of the struggle with highly challenging life crises” (p.1). Psychological trauma stress experiences (i.e., critical experiences and subsequent suffering) show that mental growth is experienced. From the results of a previous survey (Fumoto & Horiuchi, 2014), the average value of the Japanese version of the Posttraumatic Growth Inventory - short form (hereinafter referred to as PTGI-J-SF) that measures PTG is 16.4, and the average score of the item “I was deeply aware of the importance of my life” was the highest.

In addition, work engagement, which is a pair opposite concept of burnout is a concept proposed by Schaufeli et al. (2002) and was defined as follows. “A positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption” (p.74). Shimazu (2014) proposed ways to alleviate occupational stress, reduce discomfort, and increase the strength of each employee and revitalize motivation. To create an environment that works autonomously and efficiently, I should take measures to focus on the prevention and treatment of conventional diseases, damage, disorders, and defects. In addition, Shimazu stated the need to consider countermeasures such as an effort to extend the strengths of individuals and



organizations and to broaden their perspectives on promoting the growth of individuals and organizations. A study on work engagement mention midwives; Nakamura and Yoshioka (2016) reported that the group with a lower score of work engagement had a significantly higher in intention to leave. Thus, even if midwives experience traumatic stress, it is suggested that they can achieve positive changes such as post-traumatic growth, and even if work engagement is high, it is suggested that it is possible to prevent early retirement.

Whether a midwife who has experienced traumatic stress decreases in her labor productivity due to deterioration of mental health such as in the case of burnout, or positively changes such as an increase in work engagement, needs to be carefully assessed. Previously, Halbesleben, (2010a) indicated that the work environment (e.g., support system) and personal factors (e.g., resilience) influence the experience outcome of midwives as either negative or positive. We previously identified resilience as the personal factor, and we have shown that resilience has a negative correlation with PTSD risk; however, we were not able to clarify the effect of the workplace environment (Fumoto & Horiuchi, 2014). In addition, research on mental health support, employment continuation support, and development of stress management education for midwives who have experienced traumatic stress have not yet been conducted.

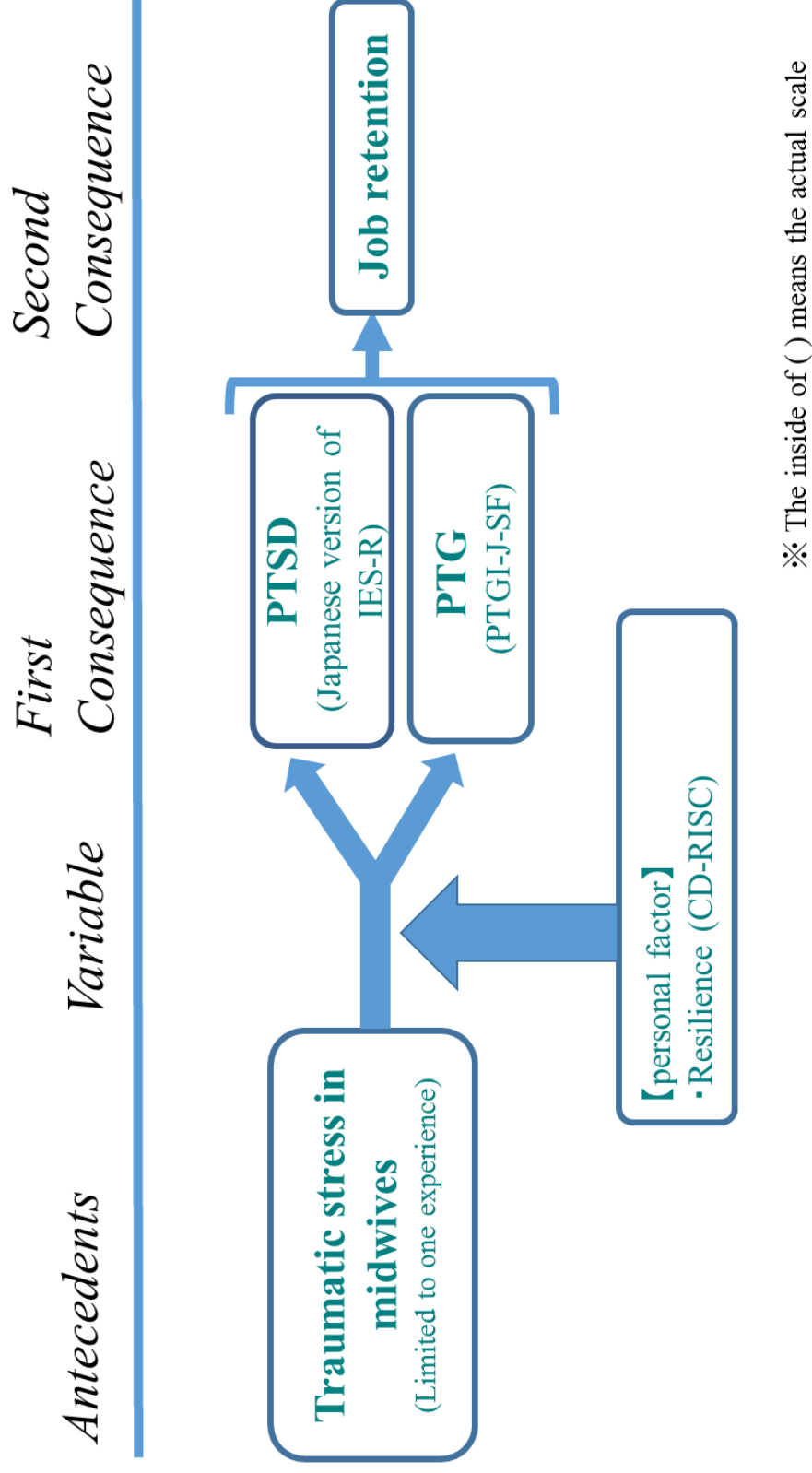
Therefore, this survey focuses on the workplace environment for midwives, workplace environmental factors necessary for midwives who experienced traumatic stress, and concrete remedial measures and proposals for effective intervention among midwives. If these factors are clarified, such information will be important for enhancing the mental health quality of midwives and preventing their early retirement even if they experience traumatic stress.

## 2. Conceptual framework

### 1) Conceptual framework of previous survey (Fumoto and Horiuchi, 2014)

First, the conceptual framework of the previous survey conducted by Fumoto and Horiuchi (2014) will be described (**Figure 1**). The antecedents were taken as one traumatic stress experience of midwives. As a first consequence, a negative change was

PTSD and a positive change was PTG. Furthermore, resilience, which is the characteristic of individuals, was used as a variable that can be influenced in relation to the preceding antecedent requirement and consequences. A second consequence was the willingness to continue employment resulting from negative and positive transformations. The survey clearly showed that the higher the resilience, the lower the PTSD, which supported this conceptual framework.

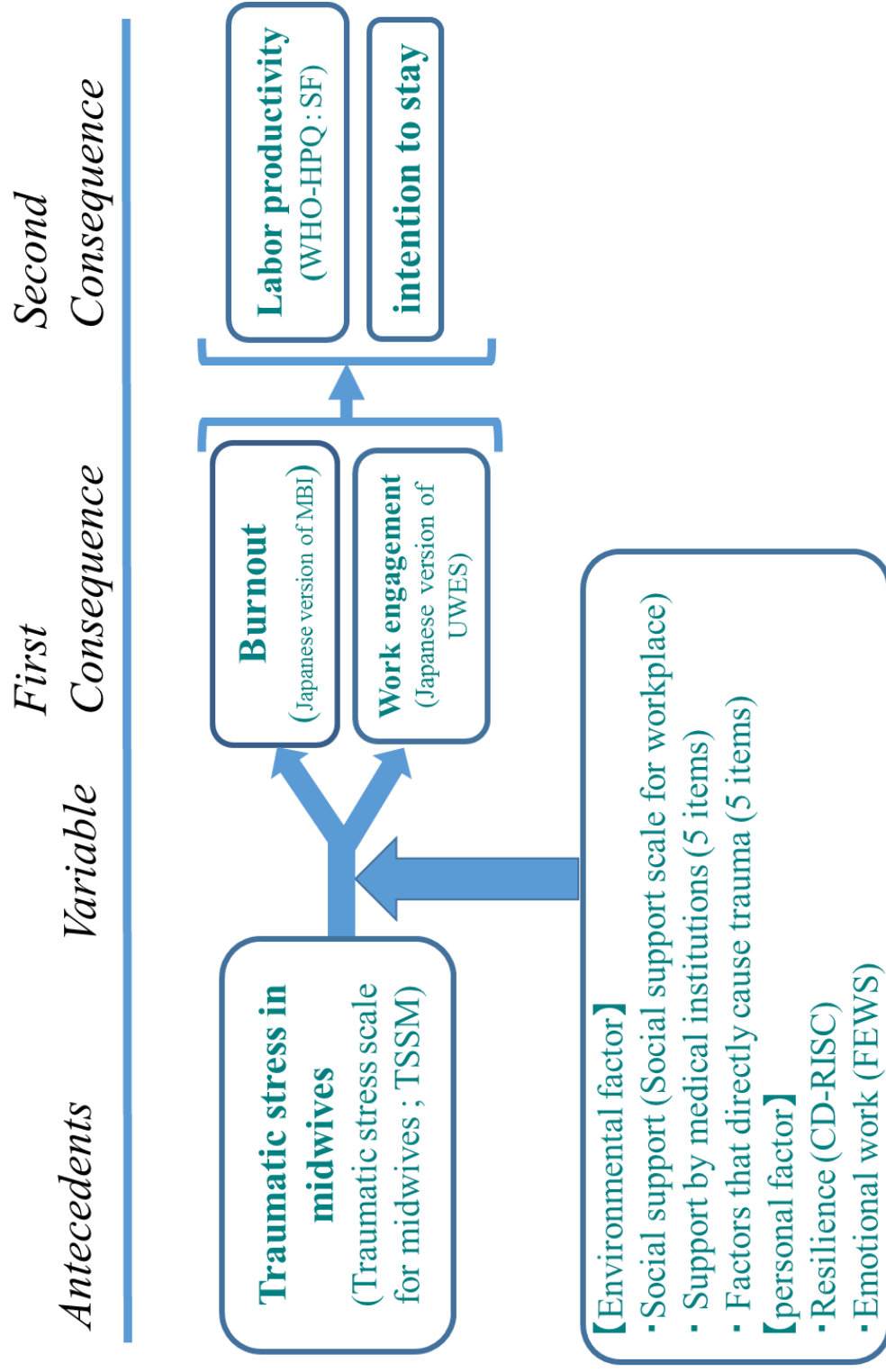


**Figure 1. Conceptual framework of previous survey.**

## 2) Conceptual framework of this research

In the preliminary survey questionnaire (Fumoto & Horiuchi, 2014), the traumatic stress experiences of midwives are limited to only one. However, midwives described multiple experiences in that survey. Thus, midwives experiences of traumatic stress were not limited to only one, but to multiple experiences. Therefore, this study aimed to comprehensively capture the traumatic stress experiences of midwives. To establish a measurement method using the multiple experiences variable, measurement of “traumatic stress in midwife” was developed as a variable for the antecedent. As for the first consequences, these were assumed to include a state of exhibiting burnout or a psychological state of increased work engagement. The variables that can be influenced in relation to the antecedent and consequences are work environment and personal factors. As the workplace environment was not mentioned in our previous survey, I will measure the workplace environment using three methods.

The first method is using the social support scale for workplace (Komaki & Tanaka, 1993). The second method is the use of a pamphlet entitled, “Responding to unexpected death or stillbirth caused by medical treatment (2015)” published by the Japan Nursing Association. Five methods are listed in the pamphlet as a concrete support method for support of stakeholders by medical institutions. These methods are considered as good practices and they are measured to indicate whether midwives actually received support. Finally, in our preliminary survey (Fumoto & Horiuchi, 2014), midwives who encountered neonatal asphyxia or maternal sudden change wherein a doctor passed the responsibility were abused and could not get support from their superior. This implies measurement of the existence of “direct injury causing factors” (e.g., direct trauma experience). For individual factors, these included resilience and emotional labor. As second consequences, these included *labor productivity* and *intention to continue work* that the state of burnout or work engagement brings (**Figure 2**).



※ The inside of ( ) means the actual scale

**Figure 2. Conceptual framework of this research.**

### 3) Review of key concept of this research

#### (1) Burnout

Burnout is a response to psychological strain caused by interpersonal relationships in the workplace (Maslach et al., 1996). Burnout is not specific to helping professions or exposure to traumatic events; however, it is often associated with the responses to trauma by professionals. It is characterized by symptoms of emotional exhaustion, depersonalization, and a reduction in personal accomplishment in the workplace (Maslach & Jackson, 1981). Burnout has been associated with a reduction in efficient, quality work, increased absenteeism, and increased staff turnover in a workplace (Maslach, Schaufeli, & Leiter 2001).

In Japan, 162 midwives were surveyed regarding the relationship between the actual condition of burnout and then workplace environment. It was reported that 18.3% of midwives showing burnout were in their 30s, had 10-19 years of work experience, married, and working in delivery rooms and newborn baby laboratories (Matsumaru, Kimura, Nemoto, Shimagami, & Takeda, 1987). Furthermore, from the same survey, as factors leading to employment burnout, lack of trust relationship with doctors, lack of mutual support trust relationship with superiors and dissatisfaction with management, chronic fatigue due to irregular work, and the desire for self-realization against work were not satisfied. Fujimura and Akizuki (2016) also investigated the relationship between burnout and stress at work in 708 hospitals as a result of conflicts between the staff and workload, with the possibility of causing burn out among midwives.

Looking at overseas surveys, burnout was measured in 598 midwives from Norway. About 20% of the midwives showing personal or work-related burnouts reported that client-related burnouts were less than 5%. Also, the job-related burnout prevalence rates were high among young people and single midwives (Henriksen & Lukasse, 2016). Danish midwives and obstetricians were measured for their psychosocial health levels including burnout by Schröder et al. (2016). They reported that midwives have overwhelmingly higher psychosocial health problems. According to a survey of 978 midwives in Sweden, about one-third of midwives reported that they experienced personal, business, or client burnout (Hildingsson et al., 2013). Mollart et al. (2013)

investigated the incidence of business stress and burnout, and the level of burnout, in midwives who work for 152 public hospitals in the UK. They reported that more than 60% of the midwives experienced a high level of emotional exhaustion, and about 30% of the midwives felt depersonalization and a retreat of personal accomplishment (Mollart et al., 2013).

According to previous studies in Japan and abroad, surveys on the actual burnout conditions of midwives were investigated, and it was reported that midwives experience burnout from work stress.

## (2) Work Engagement

Work engagement, which is proposed as an opposite pair concept of burnout is made up of “vitality”, “enthusiasm”, and “immersion”.

Maslach and Leiter (1997) mentioned the importance of preventing burnout and proactive efforts using the phrase *Engagement with work*.

Looking at studies of work engagement, Vander et al. (2016) targeted 675 visiting nurses in Belgium and investigated work resources such as job demand, support and educational environment, burnout, and work engagement. As for the results, workloads and emotional requirements showed a positive correlation with burnout, and all work resources increased work engagement and reduced burnout levels. Moreover, support reportedly buffered the positive relationship between workload and burnout.

In addition, Manning (2016) investigated the influence of the nurse manager’s leadership on the work engagement of 441 nurses working in three acute care hospitals. As a result, transaction type / transformation type leadership was positively correlated with nurses’ work engagement, and avoidance type leadership showed a negative correlation.

Most work engagement studies in Japan have targeted corporate employees, and only few studies have been conducted for medical staff. However, Kobuchi et al. (2012) evaluated 490 care workers. They found a negative correlation between burnout and work engagement, and suggested that early retirement is high if work engagement is low.

Imamura et al. (2016) used a psychoeducational website called UTSMed consisting of general mental health literacy and cognitive behavior skills for 313 workers, and no intervention for 300 workers as a control group. The follow-up survey after four months showed that UTSMed increased work engagement.

The concept of work engagement has also been adapted to the medical staff, and a number of studies have been reported. Intervention research with work engagement as outcome has also been conducted, which is one of the noteworthy concepts.

### (3) Resilience

“Resilience is a physics term which means “elasticity” or “repulsion” in Western Europe in the 19th century (McAslan, 2010). When used in psychiatry, resilience has various definitions by experts. In this research, I used the definition of “adaptive process, ability, or result despite difficult or threatening situations “as defined by Masten, Best and Garnezy (1990).

In recent studies of resilience, stress caused by events in daily life is not dramatic, but it is more important than adaptation and health for big events (Lazarus, 1999). It is considered significant to examine the role resilience plays in daily life (Takatsuji, 2002). Nagauchi and Furukawa (2004) showed that important negative life events and experiences in daily life of individuals are related to resilience. Learning to increase resilience accounted for the possibility of preventing individuals from hurting themselves.

In recent years, resilience has been recognized as a key factor preventing the onset of PTSD in case of serious stress. The stimulation of the sympathetic nerve at the time of injury was found to be a risk factor of PTSD, suggesting that the ability to suppress it is related to resilience (True et al., 1993). Okano (2009) states that, “Resilience can be reversed to the ability not to develop traumatic psychiatric disorders such as PTSD or ASD (Acute Stress Disorder) even in traumatic stress” (p.150).

In Japan, Tsuno et al. (2013) examined the relationship between resilience and PTSD symptoms from municipal officials in the Kanto district where 2069 people were forced to respond to the Great East Japan Earthquake. They found that the higher the resilience, the lower the risk of having PTSD symptoms, and they reported that resilience works as



a prophylactic factor for PTSD onset. In addition, Izumi (2014) reported that 225 respondents from general hospitals showed negative correlations between resilience and occupational stress symptoms.

A previous survey by the current researchers Fumoto & Horiuchi (2014) also showed a negative correlation between resilience and the risk of PTSD development, and a positive correlation between resilience and support system. Saegert et al. (2001) and Lepore and Rowe (2006) showed that receiving social support leads to resilience. Cohen (1998) indicated that social support is associated with mental and physical health. Okano (2009) also stated that social support is the most important element for increasing resilience.

#### (4) Emotional Labor

Emotional labor is a concept proposed by Hochschild, the American sociologist in 1983. In her book “The Managed Heart - Commercialization of Human Feeling”, she defined emotional labor as “the management of feeling to create a publicly observable facial and bodily display”. Hochschild stated that one-third of American workers and about half of the working-women are emotional workers. In addition, there are emotional rules that are required in the workplace, and workers carry out their duties while giving surface performances that reveal behaviors and expressions that have appropriate emotions to customers, as well as deep-seated performances that control their own emotions. Hochschild called a worker who exchanged wages as compensation for this labor as an emotional laborer. The characteristics of emotional labor are as follows:

- ① Face-to-face or voice contact is necessary,
- ② Some kind of emotional change must be caused to others
- ③ Employers shall control workers’ emotional activities to some extent through training and management system

In the 2000s, Zapf (2002), building on Hochschild’s (1983) work, defined as “the induction or suppression of feeling in order to sustain the outward appearance that produces the proper state of mind in others – that of being cared for in a safe and a

convivial place” (p.7). In addition, he identified interpersonal aid workers as emotional labor and reconsidered them in terms of multidimensional concepts instead of one-dimensional concepts, and stated that the concept of emotional labor has not only negative aspects but also positive aspects in addition to its effects.

Thereafter, research on emotional labor has increasingly influenced nursing care workers. Lee and Kim (2016) investigated the relationship between emotional labor and quality of nursing service and intention to avail of early retirement among 300 nurses in China. They found a negative correlation between quality of nursing care and emotional labor, and a positive correlation between job-hunting desire and emotional labor.

#### (5) Labor Productivity

Evans-Lacko and Knapp (2016) surveyed about 1,000 workers in each country across Brazil, Canada, China, Japan, Korea, Mexico, South Africa, and the US, and estimated the depression status and degree and then cost of absenteeism and presenteeism in the workplace. They found that the average labor cost per capita of absenteeism in Korea was the lowest at 181 US dollars, and was the highest in Japan at 2,674 US dollars. Moreover, the average per capita labor cost of presenteeism was the highest in the US (5,524 US dollars) and Brazil (5,788 US dollars). The costs associated with presenteeism have been reported to be 5 to 10 times higher than the costs associated with absenteeism. Aysun and Bayram (2016) also investigated presenteeism, labor productivity, and mental health in 951 doctors, nurses, midwives, and health workers in Turkey. They found presenteeism in midwives who were not in their optimal health, young employees, university health staff, and health workers. The average productivity loss and the productivity reduction cost per employee were 19.92 hours / 315.57 TRY (about 88 US dollars) in two weeks and 478.08 hours / 7573.68 TRY (about 2,115 US dollars) in one year. Yoshimura et al. (2013) evaluated absenteeism or labor productivity (presenteeism) as outcome measures, and retrieved research articles in Japan to clarify whether the implementation of primary preventive measures of mental health in the workplace bring economic advantages for businesses. The cost benefit of 4 articles was calculated based on three methods, namely, improvement of workplace environment,

education for stress management for individuals, and education and training of superiors. They reported that the benefits are higher than the costs with workplace environment improvement and individual stress management education, and it was suggested that these measures may have economic advantages for business operators. About the relationship between labor productivity and mental health, Dewa et al. (2014) examined how burnout affects the productivity of doctors by conducting a systematic review. They found evidence that burnout is associated with a decrease in productivity. In addition, Prankeviciene et al. (2016) investigated factors related to burnout in 79 neurosurgeons. They indicated a positive correlation of burnout with presenteeism. In a survey in Japan, Inahana (2014) investigated the relationship between presenteeism and burnout targeting 195 nurses. It was found that burnout reduced the productivity of work, thus it was important for hospital management to prevent burnout among nurses. It can be seen from previous studies that labor productivity declines when nurses fall into the burnout state as described above.

### 3. Purpose of this research

The objectives of this research were as follows:

- 1) To describe the characteristics of the developed “**Traumatic stress scale for midwives (TSSM)**”
- 2) To identify the relationship between traumatic stress of midwives and burnout / work engagement
- 3) To clarify the influence of work environment /individual factors on the relationship between the traumatic stress of midwives and burnout / work engagement
- 4) To identify the relationship between burnout / work engagement and labor productivity / intention to work

#### 4. Significance of research

Whether unavoidable traumatic stress experiences will subsequently lead to a negative or positive change remains to be clarified. By specifying factors that affect the opposite result, it is possible to propose concrete measures to improve the workplace environment. This will improve the quality of mental health of midwives and prevent their early retirement.

Furthermore, from the results of this study, I propose the establishment of a program aimed at relieving the stress of midwives. If I succeed in developing a stress management program based on the theory of traumatic stress experiences and subsequent recovery and growth as a theoretical basis, I believe that this work will be a highly versatile research that can be applied to other medical professionals such as nurses.

#### 5. Definition of terms

The traumatic stress of midwives is defined as “Wound peculiar to employment wherein the high empathy work and required emotional work in midwives’ experience creates various feelings of ambivalence of roles in unexpected situations and events that are against obstetrical ethics, making them feel that they cannot fully function as a midwives" (Refer to Definition of Concept Analysis, P.8, which is a chapter on document review).

## **Chapter II Preliminary Study 1:**

### **—Concept analysis of the traumatic stress in midwives—**

In order to develop the scale to measure traumatic stress of midwives in clinical settings, conceptual analysis of “the traumatic stress in midwives” was conducted.

#### **1. Purpose**

To clarify the definition, to understand the traumatic stress in midwives, and to obtain suggestions on the midwife's mental health care foundation.

#### **2. Method**

This study used the approach of the concept analysis by Rodgers (2000).

#### **3. Surrogate terms and related concepts**

Traumatic stress needs to be differentiated from 1) PTSD, 2) Secondary traumatic stress, 3) Compassion Fatigue, 4) Burnout, and 5) Vicarious traumatization.

#### **4. Choosing the setting and sample**

Criteria for the selection of the samples were as follows:

- 1) Publication year: first edition - September 15, 2015
- 2) Discipline area: medicine, nursing, midwifery, psychology
- 3) Language: English literature, Japanese literature
- 4) Search term: Search terms and search formula were as follows:  
( 「traumatic stress」 OR 「PTSD/ Posttraumatic stress disorder」 OR  
「Secondary traumatic stress」 OR 「Compassion Fatigue」 OR 「Burnout」  
OR 「Vicarious traumatization」 ) AND ( 「midwife」 「midwives」 OR  
「nurse」 「nurses」 )

#### **5. Data collecting**

The database used in the search included the following: CINAHL, MEDLINE,

PsycINFO, SocINDEX, Ichūshi web (Japanese medical website). The summarized reports in the literature confirm all titles, summaries, and references, and they are determined to be proper. The exclusion criteria for this concept analysis are duplicate publication and content, irrelevant and traumatic stress of midwives, conference proceedings, not using Japanese or English language, and unobtainable articles.

As a result, the suitable content included the following: English literature: 29 research articles; Japanese literature: 4 research articles. From the results, a total of 33 reports in the literature were targeted for the concept analysis.

## 6. Data analysis

Data analysis extracted the following categories while grasping the contents of the documents:

- 1) Attribute is a characteristic that makes up the concept for each report.
- 2) Antecedent is characteristic that occurs prior to the concept.
- 3) Consequence is the result of the concept.

Portions corresponding to the related concepts were extracted from the raw data of the target research articles.

This method focuses on changes in the concept with time and circumstances, and is intended to clarify the characteristics of the concept. The concept of traumatic stress in midwives is closely related to other concepts such as values of people, which change significantly with the time era or their role consciousness (e.g., environment of health care workers, and medical needs and their roles).

Therefore, Rodger's approach indicating that a concept can be changed in various ways in terms of its context by time, cultural and ethnic backgrounds, and different norms, is suitable for this concept analysis.

## 7. Outline of results

- 1) Attribute : Five categories were extracted ; **【High empathy work and emotional work】** **【Suffering as a professional】** **【Dealing with the ambivalence of roles as a professional within the same duty】** **【Exposure to**

situation against the ethics of midwives】 【Cannot function as a midwife】

- 2) Antecedents : Five categories were extracted ; 【Differences in circumstances and contradictory unexpected situations in obstetrics can occur】 【Indirect exposure to traumatic events】 【Sources of stress】 【'Being with the woman' ideology】
- 3) Consequences : Two categories were extracted ; 【Harmful effects on midwives' own mental health】 【Threatens individual beliefs and private life】

#### 8. Definition of conceptual model and this concept

A conceptual model of the “traumatic stress in midwives” was created from five attributes, five antecedents, and two consequences (**Figure 3**). Defining the concept are the extracted five attributes and two consequences against the background of the five attributes represents the relationship between midwives and pregnant women and the features of the clinical workplace of midwives.

Attributes have shown that midwives can also be the same pregnant women, the same generation as their own, and have the same position as a mother. Thus, this overlap of circumstances makes it easy for midwives to become closer to pregnant women and reduce the sense of distance, resulting in a higher empathy for pregnant women. Furthermore, having shared with pregnant women the process of overcoming childbirth, midwives have a higher degree of empathy than other health care workers. Therefore, the traumatic experiences of pregnant women may likely cause severe wound to midwives.

Midwives experience anguish from playing their role as a professional, and they also face the situation wherein they cannot completely fulfill their role as a midwife, and such experience goes against their ideology brought about by the traumatic stresses of being a midwife. In addition, midwives suffer from ambivalent feelings caused by various situations (e.g., sudden, unexpected, contradicting, and complicated situations), which is a given feature of the clinical workplace that midwives face.

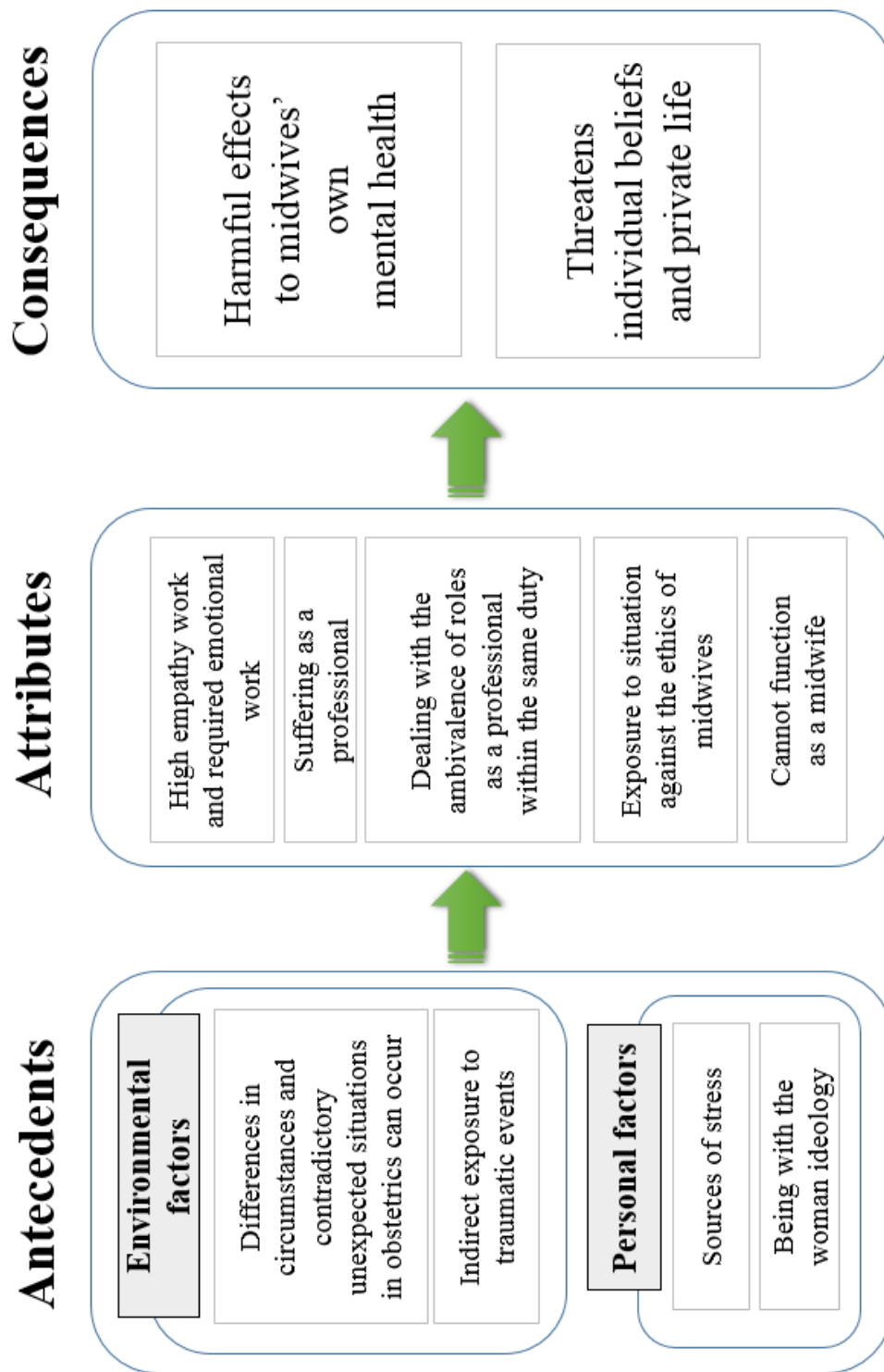
In the previous study, the term “ambivalence” was used. However, originally ambivalence in psychology was interpreted as “two-sided emotion” or “bivalence” and

is treated as “conflicting emotions and attitudes simultaneously directed to the same subject”. Therefore, I did not use the term ambivalence in this study.

The traumatic stress experience presented in the previous study was regarded as “experiencing contradictory emotions within the same duty such as assisting stillbirth immediately after being present in a scene that pleases the birth of a child.”

Taken together, this concept defined as “Wound peculiar to employment wherein the high empathy work and required emotional work in midwives’ experience create various feelings of ambivalence of roles in unexpected situations and events that are against obstetrical ethics, making them feel that they cannot fully function as a midwife”.





*Figure 3. Conceptual model of “Traumatic stress in midwives”.*

#### 9. What can happen after traumatic stress in midwives

“Traumatic stress in midwives” was defined and through this analysis, two categories were extracted: **【Get the positive elements from that experience】** and **【Causes a negative element】** as a result of the traumatic stress in midwives (**Figure 4**).

Through this analysis, it was found that the effects of traumatic experience depends on the support system of the workplace or the coping ability of the individuals to become either positive or negative factors.

Positive factors indicate growth after that, and negative factors can cause PTSD or burnout causing a decline in the quality of care for pregnant woman, and finally early retirement or leave for the midwife.

This slide shows my conceptual model of “What can happen after traumatic stress in midwives”.

## Consequences

Harmful effects  
to midwives'  
own  
mental health

Threatens  
individual beliefs  
and private life



Support system

Coping ability

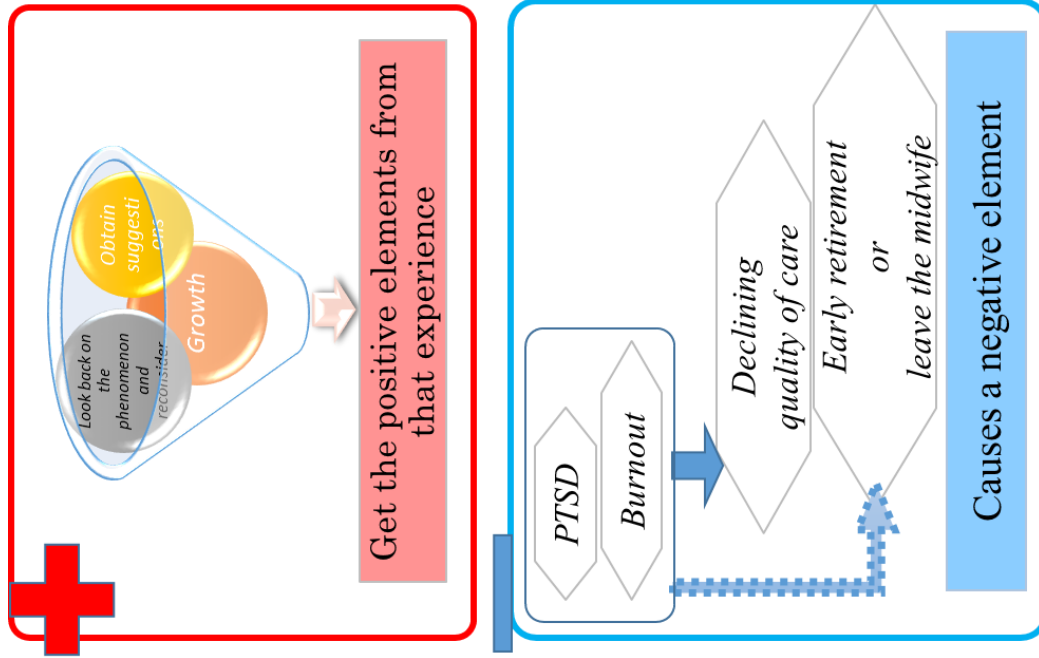


Figure 4. Conceptual model of “What can happen after traumatic stress in midwives”.

### **Chapter III Preliminary Study 2:**

#### **—Development of the “Traumatic stress scale for midwives” —**

Based on the concept analysis, I developed the “Traumatic stress scale for midwives” (TSSM) which can measure the frequency and impact of traumatic stress using multiple experiences of midwives.

In this chapter, I report the development process of pre-TSSM used in this preliminary study 2 and examined its reliability and validity.

#### **1. Purpose**

This study aimed to develop a scale for measuring the frequency and impact of traumatic stress, and to examine the reliability and validity of the developed scale.

#### **2. Method**

##### **1) Design**

Traumatic stress of midwives, whether light but occurring at repeated frequencies or severe but occurring once, determines the extent of the effect. From this background, I conducted a quantitative exploratory study using a self-report questionnaire method to create a scale for measuring the degree of traumatic stress of midwives.

##### **2) Subjects**

###### **(1) Target of study**

- ① Midwives working at a study cooperation facility
- ② Midwives who provided consent to participate in this study

The following midwives were excluded from the study:

- ① Midwives who may be in the midst of a traumatic experience
- ② Midwives who were judged by their superiors as not suited to participate in this study

(2) Number of participants

The number of participants was determined with reference to the COSMIN (COnsensus-based Standards for the selection of health Measurement INstruments) checklist (Mokkink et al., 2010a, 2010b) of the Scale Research Guidelines. If the minimum required number of objects is 5 to 7 times the number of items and 100 or more, the number of items of the scale used in this study is 38 items, and the number of subjects is 190 to 266.

3) Study facility

Facilities (i.e., hospitals, clinics, midwife homes) that advocate obstetrics, handle delivery, and require consent to participate in study were considered for this study.

4) Data collection method

(1) Data collection period

The questionnaires were distributed in October 2016 after the approval by the Ethics Review Committee, and were collected until the end of November 2016.

(2) Primary survey

The primary survey was conducted in the form of data collection for consideration of reliability (internal consistency) and reference-related validity. After obtaining the approval of the person-in-charge of the facility to be surveyed, the researcher sent by post the request for study cooperation to the person-in-charge of the target facility. Collection of the questionnaires was made using the retention method (i.e., placing in a prepared box) and the mailing method using an envelope. I obtained the consent of study cooperation together with the answers to my questionnaire from the participating institutions.

(3) Secondary survey

A secondary survey was conducted to review the reliability of the data collected. After obtaining approval from the person-in-charge of the facility where the study would be conducted, the researcher sent the study cooperation request document (for the person to be re-tested) by post to the person-in-charge

of the target facility. The questionnaires were collected by either the retention method or the mailing method using envelopes, with the reply to the questionnaires indicating consent to participate in the study. At the time of distributing the primary survey form, I also simultaneously distributed a postcard where the midwives can write their name and address if they decide to participate in the secondary survey. For the primary and secondary survey forms, a column was provided where midwives can write their own identifying symbols to enable consistent comparison of the primary and secondary survey results for each midwife. The secondary survey questionnaire was sent by post to individual midwives one month after the primary survey questionnaire was collected. As for the secondary survey questionnaire, the mailing method was adopted similarly to the primary survey, and the sending of the responses to the questionnaire indicated consent to participate in the study, and the same symbol written in the primary survey questionnaire was used in the secondary survey questionnaire.

### 3. Scale development process

#### 1) Creation and selection of question items

In the content analysis of the description contents of the column “Experiences with the most injured” obtained in a previous survey (Fumoto & Horiuchi, 2014), 43 outlines, 11 subcategories, and 4 categories were extracted. From the results, I created 43 items indicating the traumatic stress of midwives that they experience. Thereafter, the Igaku Chuo Zasshi (ICHUSHI) web, CINAHL, MEDLINE, and PsycINFO, SocINDEX databases were searched using keywords such as “traumatic stress”, “PTSD or post-traumatic stress disorder”, “secondary traumatic stress”, “compassion fatigue”, “burnout”, “vicarious traumatization”, “midwife”, “midwives”, “nurse”, and “nurses”. The search items were added based on the obtained local and international articles, resulting in the extraction of 58 items. Of these 58 items, 50 items indicated experiences of traumatic stress when a midwife learned of sudden changes or mortality of a pregnant woman among others. However, the remaining eight items were related to workplace environmental factors such as bullying in the workplace, unfair treatment, no support

from superiors, and not being acknowledged even if they work hard. These eight environmental factors of the workplace were excluded because they were obviously different from the experiences of learning sudden changes and the death of a pregnant woman or a baby. In this study, I aimed to evaluate the environmental factors of the workplace using another scale of work environment. Moreover, the items that were very similar in terms of meaning, such as “witness tragic deaths of pregnant women” and “witness the miserable condition of pregnant women” were consolidated into one item, thus 38 items were finally extracted.

## 2) Consideration of the question items

As for the method of assessing the study targets, a 4-level Likert scale of experience frequency (often ~ never) and impact level (affects heart strongly ~ affects heart weakly). Then, the experience frequency multiplied by the impact level was taken as the degree of traumatic stress. In this calculation method, I evaluated both aspects of experience frequency and impact level, with a higher score indicating a higher degree of traumatic stress. This is a general method for measuring stress used by Okayasu et al. (1992), Shima (1992), and Kikushima (2002). Kikushima (2002) stated that it is possible to examine the degree of stress including both the experience of the actual event and the individual's cognitive evaluation. Kikushima (1997, 1999) also reported that the degree of stress as a combination of experience frequency and degree of discomfort had an influence on the tendency to fail junior high school and high school. When measuring the degree of traumatic stress in midwives, I considered and multiplied experience frequency and impact level.

## 3) Consideration of content validity

To examine the content validity, I asked five midwives who have clinical experience of obstetrics for at least five years and a researcher on maternity nursing and midwifery whether the questions items are correctly balanced in the entire field of midwifery to confirm whether they are expressed properly.

#### 4) Consideration of face validity

To examine the face validity, I asked five midwives who had clinical experience in obstetrics for at least five years the following areas: ease of comprehension, ease of understanding and answering, response to the feeling of burden, and impressions and pointing out of issues. As a result of this process, there was a total of 38 question items.

#### 5) Measuring tools

##### (1) Scale for measuring depression: Japanese version of CES-D

I used the Japanese version of Center for Epidemiologic Studies Depression Scale (CES-D), which is a depression self-rating scale. As for the evaluation method of the question items, symptoms related to the depression state in the past one week was scored using the 4-point Likert scale for 20 items, and the scores were from 0 to 3 points. The score range was 0 to 60 points, and the higher the total score, the higher the depression state. The reliability and validity of the CES-D Japanese version was previously confirmed by Shima et al. (1985). It was assumed that there was a positive correlation with the scale developed similarly to the finding of Hirohata et al. (2002).

##### (2) Scale for measuring coping: Coping scale

To measure the degree of coping, the coping scale developed by Ozeki (1990) was used. This scale consists of 14 question items, and it can be divided into three factors as follows: “problem focus type”, “emotional focus type”, and “avoidance / escape type”. The evaluation method for each factor was conducted using a 4-level Likert scale as follows: “never”, “rarely”, “occasionally”, and “often”. The more coping behaviors are taken, the higher the evaluation score.

#### 4. Data analysis method

The basic statistics of each variable were calculated, exploratory factor analysis was performed to examine the validity of the construct, and the depression scale CES-D was used for examining the reference-related validity. Cronbach's  $\alpha$  coefficient was calculated to investigate internal consistency, and the intraclass correlation coefficient



(ICC) of scores between the two surveys conducted on the same subject was calculated to assess stability.

The statistical significance level was set at 5% for two-sided tests, and SPSS Statistics Version 24.0 for Windows was used for data analysis. A statistical expert was consulted to confirm the analysis results.

## 5. Ethical considerations

All processes stipulated in the study must have the following contents in compliance with ethical principles.

- 1) Participation in this study is based on the free will of study collaborators, and there is absolutely no disadvantage even if you refuse to participate in the study.
- 2) Answers to the questionnaire and envelopes for reply shall be anonymous, ensuring anonymity and privacy of study collaborators.
- 3) The obtained data should be used for study purposes only.
- 4) To strictly manage materials, information, and data collected or generated for study for three years after the end of the study. All personal information was made anonymous. After saving, all data were cut and discarded.
- 5) Store the obtained data in a locked place that can be used only by researchers.
- 6) After summarizing this study as a preliminary study for a postgraduate doctoral thesis, it is scheduled to be published in a conference proceeding or a specific journal, enabling protection of privacy such that individuals and facilities are not specified.
- 7) This study was conducted after receiving approval from the Research Ethics Review Committee of St. Luke's International University (approval number: 16-A 027).
- 8) Some disadvantages predicted by the study collaborators and their correspondence are as follows:

The questionnaire was about the traumatic stress of midwives and it was thought that recalling the traumatic stress posed the danger of affecting their mental health. Therefore, when distributing questionnaires, I asked the persons in charge of the

target facility to take care in distributing to the midwives who are currently experiencing trauma. In addition, when collaborators wanted psychological support, they sought counseling from an expert (i.e., social worker/family counselor: Ms. Keiko Ishii) at an early stage and made a statement to that effect on the front page of the questionnaire.

## 6. Results

Of the 15 facilities requested to participate in the study, cooperation was obtained from 10 institutions consisting of comprehensive perinatal maternal and child medical center, regional perinatal maternal and child medical center, general hospital, clinic, maternity home, and university located in Tokyo, Kanagawa prefecture, and Hokkaido (facility cooperation rate: 45.5%). The breakdown of the 10 facilities was as follows: 1 comprehensive perinatal maternal and child medical center, 1 regional perinatal maternal and child medical center, 1 general hospital, 3 clinics, 3 maternity homes, and 1 university. Moreover, of the 190 midwives I asked in the 10 facilities for cooperation with the study, I obtained responses from 129 midwives (collection rate: 66.7%). Of these 129 midwives, one who was almost unresponsive to the questionnaires was excluded, thus 128 effective respondents (effective recovery rate: 67.4%) were finally enrolled.

### 1) Attributes of the respondents

The ages ranged from 24 to 74 years, with an average age of 38.45 years ( $SD = 9.2$ ). The average number of years of employment as a nurse (including midwives) was 13.1 years ( $SD = 8.8$ ). As for the midwifery educational background, 46 (35.9%) attended midwifery training school, 24 (18.8%) junior college, 38 (29.7%) university, 5 (3.9%) non-degree course for graduates, and 13 graduate school (10.2%). The current workplaces were as follows: 53 (41.4%) at perinatal maternal and child medical centers and 9 (7.0%) at general hospitals, thus hospitals accounted for about half of the total workplaces. In addition, 41 worked in other clinics (32.0%) and 20 in maternity homes and educational institutions (15.6%).

In August 2015, the midwifery practicing ability proficiency stage (clinical ladder) CLoCMiP (level III) certification system was started. The *Clinical Ladder of Competencies for Midwifery Practice* (CLoCMiP): The Japanese Midwife Evaluation Organization certified Level III based on CLoCMiP was established by creating a Level III certification system in five midwifery related organizations. The certified midwife was called “advanced midwife”. There were 54 advanced midwives who were CLoCMiP level III in this study (42.2%).

## 2) Basic statistics of frequency, impact, and degree of trauma in 38 items of the pre-TSSM

In terms of frequency, the average score of frequency was 30.67 ( $SD = 10.0$ ). Thereafter, I performed one-way ANOVA with frequencies as the dependent variables and employees as the independent variables, and found no significant association between them. In addition, when the t-test was conducted in relation to the presence or absence of frequency acquisition of CLoCMiP level III and the frequency, advanced midwives who were Level III acquirers showed a significantly higher frequency than those who were not Level III acquirers ( $p < 0.01$ ). Furthermore, the mean frequency of the 38 items of the pre-TSSM was 0.811 ( $SD = 0.5$ ). The first five items that had a high frequency of experience were “They do not know what will happen in the childbirth place (1.85)”, “NICU hospitalization of the child (1.78)”, “Disregarded oneself when providing care (1.66)”, “Mothers experience shock and get hurt(1.48)”, and “Intrauterine fetal death (1.30)”. On the other hand, the items that had a low frequency of experience were “Students get hurt (0.06)”, “The uterine inversion that I caused (0.09)”, “Relatives' trauma (0.13)”, “Fourth degree laceration I caused (0.19)”, “Patient suicide and a miserable scene of the incident (0.20)”.

In terms of impact, the average score of impact was 88.58 ( $SD = 19.7$ ). The one-way ANOVA showed no significant differences in the degree of impact as the dependent variable and working place as the independent variable. In addition, a t-test was conducted in relation to whether advanced midwives had traumatic stress or not. It was shown that advanced midwives had a significantly higher degree of impact than non-

advanced midwives ( $p < 0.01$ ). Furthermore, the mean impact of trauma of the 38 items of the pre-TSSM was 1.41 ( $SD = 0.6$ ). The first five items with the highest degree of trauma were “Incidents I think I caused (3.37)”, “I was disappointed with myself that cannot do anything in an emergency (3.30)”, “The tearful appearance and their expression of parents who lost their child (3.19)”, “Negative emotions of mothers caused by myself (3.13)”, and “Mothers experience shock and get hurt (3.02)”. On the other hand, the items with a low impact of experience were “Students get hurt (1.16)”, “The uterine inversion that I caused (1.33)”, “Relatives’ trauma (1.40)”, “Relationship with raped women (1.55)”, and “Colleague's trauma”.

In terms of degree of trauma, the average score was 93.63 ( $SD = 34.2$ ). The one-way ANOVA showed no significant differences in the degree of trauma as the dependent variable and working place as the independent variable. In addition, a t-test was conducted in relation to whether advanced midwives had traumatic stress or not. It was shown that advanced midwives had a significantly higher degree of traumatic stress than non-advanced midwives ( $p < 0.01$ ). Furthermore, the mean degree of trauma of the 38 items of the pre-TSSM was 1.67 ( $SD = 0.9$ ). The first five items with the highest degree of trauma were “Disregarded oneself when providing care (4.91)”, “They do not know what will happen in the childbirth place (4.47)”, “Mothers experience shock and get hurt (4.43)”, “Incidents I think I caused (4.34)”, and “Intrauterine fetal death (4.23)”. On the other hand, the items that had a low degree of trauma were “Student’s get hurt (0.13)”, “The uterine inversion that I caused (0.30)”, “Relatives’ trauma (0.41)”, “Fourth laceration caused by myself (0.67)”, and “Patient suicide and a miserable scene of the incident (0.70)”.

### 3) Reliability of pre-TSSM

#### (1) Reliability coefficient

Factor analysis (without rotation) by the maximum likelihood method was carried out to select the item of pre-TSSM created at this time. I found 12 factors with a sum of squared load amount after extraction and an eigen value of 1 or more. Therefore, the factor extraction method used was the maximum likelihood method,

the fixed number of factors was set to 12, and factor analysis by Promax rotation was performed. I found that it converged with 37 rotations. Looking at commonality, there were two items with a factor extraction of less than 0.2 and were thus deleted, and factor analysis was repeated. However, as a single item or interpretable factor solution could not be obtained, instead of the factor selection method, I referred to the Scree plot and the concept of this scale, and adopted a six factor solution.

Thereafter, factor analysis by the main factor method (Promax rotation) was performed again. Items showing a factor loading amount of 0.4 or more in the factor pattern and items with a low degree of traumatic stress in the basic statistics of all 38 items were deleted and the results of 16 items by six factor structure were analyzed using the pre-TSSM (**Table 1**).

The six factors obtained were interpreted as follows. The first factor was “Loss of Mother”, the second factor was “Regret about my Midwifery Practice”, the third factor was “Fetal death and assistance provided”, the fourth factor was “Loss of Baby”, the fifth factor was “Conflicting Thoughts over the Treatment Choice in the Perinatal Care Field”, and the sixth factor was “The Baby’s Life was Neglected”.

The reliability coefficient (Cronbach’s  $\alpha$  coefficient) was calculated to verify the reliability of pre-TSSM. The Cronbach’s  $\alpha$  coefficient was  $\alpha = .792$  for the item with only *frequency* of all the 16 items,  $\alpha = .878$  for the item with only *impact*, and  $\alpha = .798$  for the degree of trauma, indicating a standard of internal consistency in all the cases. In addition, the Cronbach’s  $\alpha$  coefficient factor for each factor was  $\alpha = .882$  for the first factor,  $\alpha = .771$  for the second factor,  $\alpha = .790$  for the third factor,  $\alpha = .617$  for the fourth factor,  $\alpha = .587$  for the fifth factor, and  $\alpha = .545$  for the sixth factor.

## (2) Item scale scores correlation

The overall correlation of each item on the whole and subscale was as follows: the first factor was  $r = .505$  ( $p < 0.05$ ), the second factor was  $r = .572$  ( $p < 0.05$ ), the third factor was  $r = .725$  ( $p < 0.05$ ), the fourth factor was  $r = .687$  ( $p < 0.05$ ), the fifth factor was  $r = .474$  ( $p < 0.05$ ), and the sixth factor was  $r = .554$  ( $p < 0.05$ ).

There was a significant positive correlation with the overall scale of each item. Therefore, the internal consistency of the pre-TSSM was confirmed.

### (3) Test-retest method

The retest method mainly pursues the reliability concerning stability. The same test is performed with the same subjects leaving a period, and the first and second test results are compared. If the first and second test results match, this indicates a high stability, and the reliability is high if the intra-class correlation coefficient (ICC) is 0.7 or more as an index.

To examine the reliability by the retest method, the same questionnaire survey as the primary survey was conducted twice at intervals of more than one month. Of the 86 subjects who requested the retesting method, there were 74 effective respondents (effective recovery rate 86.0%).

The items with only frequency in the 16 items in the pre-TSSM one month later had an ICC = .860 ( $p < 0.05$ ), only impact had an ICC = .884 ( $p < 0.05$ ), and degree of trauma had an ICC = .846 ( $p < 0.05$ ). Moreover,  $\geq 0.70$ , which is the standard ICC for all cases, was shown.

In addition, to verify the reliability of the pre-TSSM after one month, the reliability coefficient (Cronbach's  $\alpha$  coefficient) was calculated. The Cronbach's  $\alpha$  coefficient was  $\alpha = .900$  for items with only frequency,  $\alpha = .922$  for items with only degree of impact, and  $\alpha = .914$  for degree of trauma. This showed that 0.70 or more was the standard of internal consistency for all scales.

### 4) Basic statistics of frequency, degree of influence, and degree of trauma in 16 pre-TSSM

In terms of frequency, the average of frequency in the 16 items of pre-TSSM was 0.912 ( $SD = 0.1$ ). The first five items that had a high frequency of experience were "Disregarded oneself when providing care (1.66)", "I cannot understand the target's remarks or thoughts (1.30)", "Intrauterine fetal death (1.30)", "The tearful appearance and expression of parents who lost their child (1.28)", and "Incidents I think I caused (1.27)". On the other hand, the items that had a low frequency of experience were

“Maternal death (0.22)”, “Baby’s life was neglected by the family (0.28)”, “A sorrowful appearance of the family whose mother died (0.30)”, “Sadness of the father who was left behind (0.32)”, and “Baby’s life was neglected by the doctor (0.51)”.

In terms of impact, the average score of impact was 2.61 ( $SD = 0.1$ ). The first five items that had the highest impact were “Incidents I think I caused (3.37)”, “I was disappointed with myself that cannot do anything in an emergency (3.30)”, “The tearful appearance and expression of parents who lost their child (3.19)”, “Negative emotions of mothers caused by myself (3.13)”, and “Intrauterine fetal death (3.00)”. On the other hand, items that had a low impact of experience were “Maternal death (1.77)”, “Baby’s life was neglected by the doctor (1.77)”, “A sorrowful appearance of the family whose mother died (1.80)”, “Sadness of the father who was left behind (1.84)”, and “Baby’s life was neglected by the family (2.21)”.

In terms of degree of trauma, the average score was 2.95 ( $SD = 0.3$ ). The first five items with the highest degree of traumatic stress were “Disregarded oneself when providing care (4.91)”, “Incidents I think I caused (4.34)”, “Intrauterine fetal death (4.23)”, “The tearful appearance and expression of parents who lost their child (4.19)”, and “Disappointed with myself that I cannot do anything in an emergency (3.93)”. On the other hand, the items that had a low degree of trauma were “Maternal death (0.84)”, “Baby’s life was neglected by the doctor (0.98)”, “A sorrowful appearance of the family whose mother died (1.06)”, “Sadness of the father who was left behind (1.12)”, “Baby’s life was neglected by the family (1.73)”.

Table 1

*Factor analysis (principal factor analysis, promax rotation) of degree of trauma among midwives, and frequency, impact and degree of trauma of each item (N = 128)*

		Factor loading						frequency	impact	degree of trauma
		1	2	3	4	5	6			
1 Loss of Mother	Sadness of the father who was left behind	0.954	0.005	-0.029	0.143	0.081	-0.134	0.32	1.84	1.12
	A sorrowful appearance of the family whose mother died	0.938	0.02	-0.016	0.01	0.059	-0.041	0.30	1.80	1.06
	Experience maternal death	0.637	-0.065	0.066	-0.107	-0.142	0.199	0.22	1.77	0.84
2 Regret about my Midwifery Practice	Disregarded oneself when providing care	-0.017	0.737	-0.095	-0.028	0.072	-0.119	1.66	2.95	4.91
	I was disappointed with myself that cannot do anything in an emergency	0.018	0.725	-0.092	0.064	-0.079	0.013	1.13	3.30	3.93
	Negative emotions of mothers caused by myself	0.134	0.593	0.162	-0.196	-0.125	0.226	0.98	3.13	3.38
	Incidents I think I caused	-0.173	0.54	0.096	0.1	0.146	-0.056	1.27	3.37	4.34
	Assistance of stillbirth	-0.084	0.058	0.86	0.061	0.028	-0.024	1.17	2.91	3.78
3 Fetal Death and Assistance Provided	Assistance of induced abortion	0.064	-0.08	0.741	-0.118	0.003	-0.02	0.96	2.57	3.02
	Experience intrauterine fetal death	0.041	-0.018	0.548	0.409	-0.083	-0.06	1.30	3.00	4.23
	Experience neonatal death	0.028	-0.036	-0.04	0.765	-0.167	0.09	0.79	2.63	2.66
4 Loss of Baby	The tearful appearance and expression of parents who lost their child	0.028	0.064	0.029	0.569	0.208	0.137	1.28	3.19	4.19
	Inconsistent treatment policy	0.011	-0.115	0.092	-0.154	0.898	0.082	1.13	2.69	3.38
5 Conflicting Thoughts over the Treatment Choice in the Perinatal Care Field	I cannot understand the target's remarks or thoughts	0.009	0.177	-0.131	0.075	0.465	0.023	1.30	2.64	3.46
	Baby's life was neglected by the family	-0.083	-0.088	-0.088	0.227	0.019	0.728	0.28	2.21	1.73
6 The Baby's Life was Neglected	Baby's life was neglected by the doctor	0.095	0.077	0.016	-0.032	0.14	0.537	0.51	1.77	0.98



## 5) Reliability of pre-TSSM

### (1) Criterion-related validity

It has been reported that there is a positive correlation between traumatic stress and depression (Hirohata et al., 2002). In the present study, to verify the relevance of the criteria related to pre-TSSM, I examined the relationship between each factor of pre-TSSM and depression (CES-D).

Regarding the degree of depression (CES-D), The Cronbach's  $\alpha$  coefficient in the subjects of this study was  $\alpha = .765$ , and the average score was 12.10 ( $SD = 6.11$ ). The Pearson's correlation coefficient of the 16 items of pre-TSSM and CES-D was  $r = .208$  ( $p < 0.05$ ). Looking at the subscale, a low positive correlation was found between the second factor "Regret about my Midwifery Practice" and CES-D ( $r = .245, p < 0.05$ ).

### (2) Divergent validity

Based on the score of the degree of trauma, the high score group and the low score group were constructed based on the average value of 46.99 ( $SD = 17.6$ ). Then, using the group as an independent variable, a  $t$ -test between the groups was performed using each of six factor scores of pre-TSSM and the total score as dependent variables. Significant differences were observed between the groups in all the six factor scores and total score ( $p < 0.01$ ). In both cases, it was revealed that the high score group exhibited a higher level of trauma than the low score group.

## 7. Discussion

The employment stress scale for nursing was related to occupational stress, and midwives were treated to have equivalent stress as nurses. However, midwives have additional specializations of performing midwifery diagnosis / midwifery practice, including delivery assistance. In addition to the stress experienced by nurses, midwives also experience stress from their specialization. However, no scales have been developed to date for measuring stress for midwives, particularly traumatic stress. Only two methods for evaluating stress have so far been used. One method was to measure individual "subjective" receipt of stress as proposed by Lazarus and Folkman (1984),

and the other method was to measure the “objective” rating of handling the frequency of experience of stressful events as proposed by Holmes et al. (1967).

As a method of measuring the degree of trauma resulting from traumatic stress experienced by a midwife, not only the content of the experience and the frequency of experience, but also how individuals assimilated it, that is, the reality of the experience was also an important factor. Even if it was the same experience, such as a sudden change in a newborn baby or assistance for stillbirth, the reality of capturing and feeling the experience will naturally differ depending on personal characteristics, personality, and human relations.

Therefore, the present scale that I developed was in reference to the method previously studied by Kikushima (2002) among university students wherein the degree of stress is combined with the frequency and impact of stress.

The objectives of this study were to develop a scale that can measure the degree of trauma and to examine its reliability and validity. According to previous studies, this study has not yet been reported. From the results of the factor analysis based on the main factor method and factor rotation, a scale consisting of six subordinate concepts, totaling 16 items, was created.

The reliability of pre-TSSM was examined using 1) Cronbach’s alpha coefficient, 2) item scale score correlation, and 3) retest reliability as follows. The Cronbach’s alpha coefficients were as follows: sum of the 16 factors ( $\alpha = .798$ ), first factor ( $\alpha = .882$ ), second factor ( $\alpha = .771$ ), and third factor ( $\alpha = .790$ ), thus a high reliability was obtained. For the item scale score correlation, a significant positive correlation was found between the item six, scale factor and the scale as a whole. For the results of the re-test reliability, the ICC = .846 ( $p < 0.05$ ) indicated certain reliability. Therefore, pre-TSSM was shown to be a reliable measure.

The validity of pre-TSSM was examined using 1) surface validity, 2) criterion-related validity, and 3) discriminatory validity as follows. In consideration of surface or face validity, I asked five midwives who had clinical experience in obstetrics for at least five years. Considering the time required for giving a response, ease of responding, ease of understanding, sense of burden on providing responses, comments, and points of

remarks, midwives can easily understand the contents of pre-TSSM and modify them to expressions, thus taking their burden into consideration. For criterion-related validity, the correlation coefficient between CES-D and pre-TSSM was examined. The Pearson's correlation coefficients of pre-TSSM and CES-D were  $r = .208$  ( $p < 0.05$ ), with the second factor "Regret about my Midwifery Practice" showing  $r = .245$  ( $p < 0.05$ ). For discriminatory validity, there were significant differences between the groups in all the six factor scores and the total score.

Yatomi et al. (1991) pointed out that those who experience many stressors in their workplace have a high stress response and poor mental and physical health. Therefore, the results of the present survey were supported. Consequently, it can be considered that the validity of pre-TSSM could be verified.

However, there were some aspects to consider in pre-TSSM. First, low reliability coefficients (Cronbach's  $\alpha$  coefficient) were observed for the fourth factor ( $\alpha = .617$ ), fifth factor ( $\alpha = .587$ ), and sixth factor ( $\alpha = .545$ ). Secondly, as the number of samples evaluated was smaller than the number of samples originally planned, and as the selected target facilities were from Tokyo, Kanagawa prefecture, and Hokkaido, the generalize ability of the results may be limited. In addition, for the purpose of this study, the listed traumatic stress of midwives was measured in terms of frequency, impact, or both. Comparing the correlation coefficient between frequency and CES-D ( $r = .180$ ,  $p < 0.05$ ) and impact and CES-D ( $r = .183$ ,  $p < 0.05$ ), both showed a significantly positive correlation. However, both showed very weak correlation coefficients, and the difference was very small. This needs to be further verified in future research using a large number of samples and a tool for measuring traumatic stress that is more appropriate than CES-D.

Although there were limitations as described above, certain types of reliability and validity could be verified as a measure for pre-TSSM. In future studies, a larger number of samples will facilitate the acquisition of more comprehensive data and the consequent review and upgrading of pre-TSSM aiming at its application to other research areas and clinical settings.

**Chapter IV Preliminary Study 3:**  
**—Reliability and validity of the TSSM—**

In this chapter, I examined construct and concurrent validity and the reliability of the TSSM for measuring the frequency, impact and degree of trauma using larger sample.

1. Purpose

To examine construct and concurrent validity and the reliability of the TSSM..

2. Methods

1) Design

This quantitative exploratory study used a self-report questionnaire across Japan at 101 facilities (perinatal medical centers, general hospitals, clinics, midwifery homes).

2) Subject

I obtained responses from 652 midwives (60.2%). Of these 652 midwives, the one who was 80% unresponsive to the questionnaires was excluded, thus 650 effective respondents (effective recovery rate: 60.0%) were finally enrolled.

3) Measuring tool

TSSM, which was developed by the researcher, was used in this study. The reliability and validity of TSSM were verified in my preliminary study 2, and measurements were carried out using the four-level Likert scale of frequency, impact, and degree of trauma for the same item in all 16 items. The extent of frequency was scored from 0 to 48 points; a higher score indicated more experienced of traumatic stress experiences. The extent of impact was scored from 16 to 64 points; a higher score indicated more got hurt by traumatic stress experiences. The degree of trauma is multiplied by frequency and impact, and the extent of degree of trauma was scored from 0 to 192 points. However, the numerical value of this score and the degree of trauma as a total of frequency and impact did not match. For example, the degree of trauma in one item is a value that can range

from 0 to 12 points. There is a case where the size of the score does not coincide with the size of the trauma as total of frequency and impact (reversed) (3, 4, 6, 8, 9). Otherwise, (0, 1, 2, 12) indicated the size of the trauma as total of frequency and impact. However, it can be said that there is no discrepancy between the size relationship of the scores and the size relationship of the trauma as total of frequency and impact in a large point difference (for example, 3 points and 9 points). Therefore, I decided to calculate the value of degree of trauma this time.

#### 4) Data analysis

The basic statistics of each variable were calculated, exploratory factor analysis was performed to examine the validity of the construct. Cronbach's  $\alpha$  coefficient was calculated to investigate internal consistency.

The statistical significance level was set at 5% for two-sided tests, and SPSS Statistics Version 24.0 for Windows was used for data analysis. A statistical expert was consulted to confirm the analysis results.

#### 5) Ethical consideration

This study commenced after the Research Ethics Review Committee of St. Luke's International University approved the study (approval number: 17-A 005).

### 3. Results

#### 1) Factor structure of frequency, Cronbach's $\alpha$ , and factor correlation (**Table 2**)

A factor analysis using the maximum likelihood method without rotation was carried out. The frequency factor structure reference value of the sample validity of Kaiser - Meyer - Olkin was 0.830. The sum of the squared load amount after extraction and an eigenvalue of 1 or more yielded four factors. Therefore, the factor extraction method used was the maximum likelihood method, the fixed number of factors was set to four, and factor analysis by Promax rotation was performed. I found that it converged with five rotations.

In terms of the reliability of frequency, the reliability coefficient (Cronbach's  $\alpha$

coefficient) was calculated. Cronbach's *alpha* coefficient for the total scale (16 items) was  $\alpha = .848$ . In addition, the Cronbach's alpha for the first factor was  $\alpha = .833$ , for the second factor,  $\alpha = .727$ , for the third factor,  $\alpha = .699$ , and for the fourth factor,  $\alpha = .685$ . "A Cronbach's alpha of 0.70 or more is the standard level of almost acceptability" (Grove, Burns & Gray, 2015, pp. 353-354).

The first factor named "Loss of Baby" included five items: "Assistance of stillbirth", "Experience with intrauterine fetal death", "The tearful appearance and their expression of parents who lost their child", "Assisting of induced abortion", and "Experience neonatal death". However, there were items, indicating death of the fetus in early pregnancy, late pregnancy, and after birth. It was summarized in the category of child's death, but the experience of child's death at various stages was included in this first factor. A prominent feature was the experience of witnessing and hearing the scene itself of the infant's death.

The second factor named "Regret about my Midwifery Practice" contained five items: "I was disappointed with myself that I could not do anything in an emergency", "Disregarded oneself when providing care", "Incidents I think I caused", and "Negative emotions of mothers caused by myself". This contained items indicating midwives' self-esteem and regretting their own actions.

The third factor named "Loss of Mother" included three items: "Sadness of the father who was left behind", "A sorrowful appearance of the family whose mother died", and "Experience maternal death". This included items where midwives were hurt by witnessing and hearing the scene surrounding the mother's death.

The fourth factor named "Value Conflicts with Parents and Doctors" had four items: "Inconsistent treatment policy", "Baby's life was neglected by the doctor", "I cannot understand target's remarks or thoughts", and "Baby's life was neglected by their family". This included midwives' experiences whereby the family or physician's actions were in conflict with her sense of values or ideas and it was hurtful.

Factor correlation was  $r = .462$  for factor 1 and factor 2,  $r = .420$  for factor 1 and factor 3, and  $r = .551$  for factor 1 and factor 4. Factor 2 and factor 3 was  $r = .266$ , factor 2 and factor 4 was  $r = .402$ . Factor 3 and factor 4 was  $r = .311$ .

Table 2

*Factor analysis (maximum-likelihood estimation, promax rotation) of frequency and Cronbach's  $\alpha$*

		Factor loading				$\alpha$
		1	2	3	4	
<b>1 Loss of Baby</b>						
3	Assistance of stillbirth	0.813	-0.116	-0.015	0.004	0.833
2	Experience intrauterine fetal death	0.799	0.053	-0.035	-0.100	
14	The tearful appearance and their expression of parents who lost their child	0.768	0.086	0.021	0.002	
11	Assistance of induced abortion	0.591	-0.059	-0.050	0.201	
1	Experience neonatal death	0.572	-0.015	0.117	-0.091	
<b>2 Regret about my Midwifery Practice</b>						
5	I was disappointed with myself that cannot do anything in an emergency	0.044	0.758	0.011	-0.087	0.727
7	Disregarded oneself when providing care	-0.117	0.754	-0.077	0.016	
8	Incidents I think I caused	0.102	0.591	0.054	-0.008	
6	Negative emotions of mothers caused by myself	-0.063	0.404	0.024	0.209	
<b>3 Loss of Mother</b>						
16	Sadness of the father who was left behind	-0.025	-0.049	0.906	0.009	0.699
15	A sorrowful appearance of the family whose mother died	0.027	0.014	0.783	0.008	
4	Experience maternal death	0.059	0.038	0.295	0.076	
<b>4 Value Conflicts with Parents and Doctors</b>						
12	Inconsistent treatment policy	0.012	-0.104	-0.042	0.840	0.685
9	Baby's life was neglected by the doctor	-0.131	0.028	0.082	0.510	
13	I cannot understand target's remarks or thoughts	0.116	0.145	-0.005	0.485	
10	Baby's life was neglected by their family	0.124	0.120	0.075	0.335	
<i>Correlation between each factors</i>						
		1	2	3	4	
		1	—	0.462	0.420	0.551
		2		—	0.266	0.402
		3			—	0.311
		4				—

## 2) Factor structure of impact, Cronbach's $\alpha$ , and factor correlation (**Table 3**)

A factor analysis using the maximum likelihood method without rotation was carried out. The frequency factor structure reference value of the sample validity of Kaiser - Meyer - Olkin was 0.672, its value was low. The sum of the squared load amount after extraction and an eigenvalue of 1 or more yielded four factors. Therefore, the factor extraction method used was the maximum likelihood method, the fixed number of factors was set to four, and factor analysis by Promax rotation was performed. I found that it converged with six rotations.

In terms of the reliability of impact the reliability coefficient (Cronbach's  $\alpha$  coefficient) was calculated. Cronbach's *alpha* coefficient for the total scale (16 items) was  $\alpha = .927$ . In addition, the Cronbach's alpha for the first factor was  $\alpha = .861$ , for the second factor,  $\alpha = .786$ , for the third factor,  $\alpha = .770$ , and for the fourth factor,  $\alpha = .437$ , only the fourth factor, the value of alpha was very low.

The first factor named "Sorrowful Situation" included three items: "A sorrowful appearance of the family whose mother died", "The tearful appearance and their expression of parents who lost their child", and "Sadness of the father who was left behind". This contained items indicating witnessing a very sad scene.

The second factor named "Disregarded the Caring for Baby" contained five items: "Assistance of stillbirth", "Assistance of induced abortion", "Experience neonatal death", "Experience intrauterine fetal death", and "Disregarded oneself when providing care". This contained items indicating dilemma or disregard for caring for stillbirth or induced abortion.

The third factor named "Ethical Problems" included six items: "Inconsistent treatment policy", "I cannot understand target's remarks or thoughts", "Baby's life was neglected by their family", "Baby's life was neglected by the doctor", "Incidents I think I caused", and "Negative emotions of mothers caused by myself". This included items indicating ethical problems caused midwives' negative emotions

The fourth factor named "Disappointed Feeling by an Emergency" had two items: "I was disappointed with myself that I cannot do anything in an emergency", and "Experience of maternal death". This included items indicating disappointed feeling by



an emergency that rarely happens.

Factor correlation was  $r = .608$  for factor 1 and factor 2,  $r = .496$  for factor 1 and factor 3,  $r = .395$  for factor 1 and factor 4. Factor 2 and factor 3 was  $r = .521$ , factor 2 and factor 4 was  $r = .656$ . Factor 3 and factor 4 was  $r = .472$ .

Table 3

*Factor analysis (maximum-likelihood estimation, promax rotation) of impact and Cronbach's  $\alpha$*

		Factor loading				$\alpha$
		1	2	3	4	
<b>1 Sorrowful situation</b>						
15	A sorrowful appearance of the family whose mother died	1.057	-0.042	-0.192	0.104	0.861
14	The tearful appearance and their expression of parents who lost their child	0.91	-0.001	-0.078	0.083	
16	Sadness of the father who was left behind	0.808	0.053	-0.057	0.036	
<b>2 Disregarded for caring for baby</b>						
3	Assistance of stillbirth	0.102	1.024	-0.271	-0.049	0.786
11	Assistance of induced abortion	-0.121	0.997	0.214	-0.158	
1	Experience neonatal death	-0.079	0.744	-0.041	0.358	
2	Experience intrauterine fetal death	0.273	0.612	0.118	0.066	
7	Disregarded oneself when providing care	-0.070	0.345	0.237	-0.001	
<b>4 Ethical problems</b>						
12	Inconsistent treatment policy	-0.342	-0.089	0.878	0.173	0.770
13	I cannot understand target's remarks or thoughts	-0.023	0.075	0.700	-0.217	
10	Baby's life was neglected by their family	0.561	-0.019	0.591	-0.130	
9	Baby's life was neglected by the doctor	0.393	0.151	0.488	0.021	
8	Incidents I think I caused	0.240	0.058	0.400	0.363	
6	Negative emotions of mothers caused by myself	0.281	-0.116	0.330	0.041	
<b>5 Disappointed feeling by an emergency</b>						
5	I was disappointed with myself that cannot do anything in an emergency	-0.006	0.298	-0.016	0.790	0.437
4	Experience maternal death	0.279	-0.109	-0.081	0.417	
<i>Correlation between each factors</i>						
	1	—	0.608	0.496	0.395	
	2		—	0.521	0.656	
	3			—	0.472	
	4				—	

### 3) Factor structure of degree of trauma, Cronbach's $\alpha$ , and factor correlation (**Table 4**)

A factor analysis using the maximum likelihood method without rotation was carried out. The frequency factor structure reference value of the sample validity of Kaiser - Meyer - Olkin was 0.842. The sum of the squared load amount after extraction and an eigenvalue of 1 or more yielded four factors. Therefore, the factor extraction method used was the maximum likelihood method, the fixed number of factors was set to four, and factor analysis by Promax rotation was performed. I found that it converged with five rotations.

In terms of the reliability for the degree of trauma, the reliability coefficient (Cronbach's  $\alpha$  coefficient) was calculated. Cronbach's *alpha* coefficient for the total scale (16 items) was  $\alpha = .860$ . In addition, the Cronbach's alpha for the first factor  $\alpha = .842$ , for the second factor,  $\alpha = .761$ , for the third factor,  $\alpha = .708$ , and for the fourth factor,  $\alpha = .703$ . A Cronbach's alpha of 0.70 or more is the standard level of acceptability.

The first factor named "Loss of Baby" included five items: "Experience with intrauterine fetal death", "Assistance of stillbirth", "The tearful appearance and their expression of parents who lost their child", "Experience neonatal death", and "Assisting of induced abortion". However, there were items, indicating death of the fetus in early pregnancy, late pregnancy, and after birth. It was summarized in the category of child's death, but the experience of child's death at various stages was included in this first factor. A prominent feature was the experience of witnessing and hearing the scene itself of the infant's death.

The second factor named "Regret about my Midwifery Practice" contained five items: "Disregarded oneself when providing care", "I was disappointed with myself that I could not do anything in an emergency", "Incidents I think I caused", and "Negative emotions of mothers caused by myself". This contained items indicating midwives' self-esteem and regretting their own actions.

The third factor named "Loss of Mother" included three items: "A sorrowful appearance of the family whose mother died", "Sadness of the father who was left behind", and "Experience maternal death". This included items where midwives were hurt by witnessing and hearing the scene surrounding the mother's death.

The fourth factor named “Value conflicts with Parents and Doctors” had four items: “Inconsistent treatment policy”, “Baby's life was neglected by the doctor”, “I cannot understand target's remarks or thoughts”, and “Baby's life was neglected by their family”. This included midwives’ experiences whereby the family or physician’s actions were in conflict her sense of values or ideas and it was hurtful.

Factor correlation was  $r = .506$  for factor 1 and factor 2,  $r = .449$  for factor 1 and factor 3,  $r = .549$  for factor 1 and factor 4. Factor 2 and factor 3 was  $r = .283$ , factor 2 and factor 4 was  $r = .420$ . Factor 3 and factor 4 was  $r = .364$ .

Table 4

*Factor analysis (maximum-likelihood estimation, promax rotation) of degree of trauma and Cronbach's  $\alpha$*

		Factor loading				$\alpha$
		1	2	3	4	
<b>1 Loss of Baby</b>						
2 Experience intrauterine fetal death		0.829	0.064	-0.030	-0.106	
3 Assistance of stillbirth		0.816	-0.111	-0.042	0.008	
14 The tearful appearance and their expression of parents who lost their child		0.749	0.059	0.027	0.029	0.842
1 Experience neonatal death		0.626	-0.014	0.100	-0.102	
11 Assistance of induced abortion		0.572	-0.060	-0.028	0.237	
<b>2 Regret about my Midwifery Practice</b>						
7 Disregarded oneself when providing care		-0.125	0.811	-0.071	-0.003	
5 I was disappointed with myself that cannot do anything in an emergency		0.076	0.717	-0.003	-0.073	0.761
8 Incidents I think I caused		0.143	0.624	0.028	-0.039	
6 Negative emotions of mothers caused by myself		-0.104	0.517	0.054	0.153	
<b>3 Loss of Mother</b>						
15 A sorrowful appearance of the family whose mother died		0.008	-0.018	0.884	-0.003	
16 Sadness of the father who was left behind		-0.017	-0.022	0.860	-0.008	0.708
4 Experience maternal death		0.071	0.046	0.284	0.060	
<b>4 Value Conflicts with Parents and Doctors</b>						
12 Inconsistent treatment policy		0.007	-0.102	-0.047	0.828	
9 Baby's life was neglected by the doctor		-0.121	0.024	0.033	0.593	0.703
13 I cannot understand target's remarks or thoughts		0.113	0.166	0.047	0.457	
10 Baby's life was neglected by their family		0.136	0.118	0.041	0.365	
<i>Correlation between each factors</i>		1	2	3	4	
1	—		0.506	0.449	0.549	
2			—	0.283	0.420	
3				—	0.364	
4					—	

#### 4. Discussion

I excerpted items from Fumoto and Horiuchi's (2014) study and I verified the reliability and validity in my preliminary study 2; six factors were assumed. In addition, the number of respondents for this current study was five times the number of respondents obtained in the preliminary study 2. Then based on the answers of the respondents from across the country, I adapted a scale consisting of a four factor structure. Four factors were as follows: the first factor was "Loss of Baby", the second factor was "Regret about my Midwifery Practice", the third factor was "Loss of Mother", and the fourth factor was "Value Conflicts with Parents and Doctors".

Compared to the six-factor structure obtained in the preliminary study, the first factor of the preliminary study "Loss of Mother" was the same as the third factor "Loss of Mother" in this study. In addition, a second factor of the preliminary study "Regret about my Midwifery Practice" was the same as that of the second factor "Value Conflicts with Parents and Doctors" in this study. Moreover, a third factor "Fetal Death and Assistance Provided" and a fourth factor "Loss of Child" of the preliminary study were included in the first factor "Loss of Baby" in this study. Also, a fifth factor "Conflicting Thoughts over the Treatment Choice in the Perinatal Care Field" and the fourth factor "The Baby's Life was Neglected" of the preliminary study were included in the fourth factor "Value Conflicts with Parents and Doctors" in this study. Looking at the items constituting each of the factors, the only difference between the preliminary study and this current study was that the two factors were aggregated into one; the composition concept did not change significantly.

Looking at the items that make up each of the four factors, the first factor and the third factor were the events that were witnessed and heard. However, the first factor "Loss of Baby" was not a rare occurrence when compared to assistance for mid-term abortion or assistance for stillbirth. Looking at the population dynamics survey of the Ministry of Health, Labor and Welfare, the number of stillbirths / rate (1,000 births) and the ratio of stillbirth by type of year was 21.0, and perinatal deaths are stillbirth after 22 weeks of pregnancy, there were 3,516 deaths during birth. However, the third factor "Loss of Mother" was a very rare occurrence in Japan. In this way, the first factor and the third

factor were similar factors in that they both involved the death however the differences emerged related to the frequency of occurrence, and whether it was the baby or a mother. As can be seen from statistical figures, midwives are highly likely to encounter an infants' death if the midwives are working at hospitals that deal with many high risk pregnant woman. However, as was previously discussed, a mother's death is a very rare occurrence, and because a mother's death is a rare event the midwife holds the idea that "That is something that shouldn't be".

Next regarding of the second factor and the fourth factor. The fact that after midwives experience certain traumatic events, upon reflection of the event the thoughts embraced were expressed as wound to their heart can be mentioned as a sharing point. The difference between the two factors was that the second factor was a very regretful experience resulting from her actions; the fourth factor was not mere actions of the midwife but those of the women, their families, and doctors. It can be said that it was a big difference. On the one hand the behavior by others that occurred conflicted with their own values, and on the other hand there were events that the midwives enacted and it was that experience that wounded their heart.

In preliminary study, the Cronbach's alpha coefficients for each factor were:  $\alpha = .882$  for the first factor,  $\alpha = .771$  for the second factor,  $\alpha = .790$  for the third factor,  $\alpha = .617$  for the fourth factor,  $\alpha = .587$  for the fifth factor, and  $\alpha = .545$  for the sixth factor. The values of Cronbach's alpha coefficient of the fourth factor to the sixth factor did not reach 0.7, which has been the accepted level of reliability. Investigation of the reliability of factors was one of the problems in the preliminary study 2. However, in the results of this study, which yielded a four factor structure, the first factor was  $\alpha = .842$ , the second factor was  $\alpha = .761$ , the third factor was  $\alpha = .708$ , and the fourth factor was  $\alpha = .703$ . In other words all four factors were above 0.70, thereby meeting the standard of internal consistency. In addition, the total TSSM's Cronbach's  $\alpha = .860$ , thus the internal consistency was secured.

## **Chapter V Methods**

### **1. Design**

This research was a quantitative exploratory study using a self-filled questionnaire method.

### **2. Study subjects**

#### **1) Target of study**

- (1) Midwives working at a research cooperation facility
- (2) Midwives who provided consent to participate in this research

The following midwives were excluded from the study:

- (1) Midwives who may be in the midst of a traumatic experience
- (2) Midwives who were judged by their superiors as not suited to participate in this study

#### **2) Number of participants**

The number of participants was determined using a method based on the number of items of the scale that required the maximum number. Assuming that the minimum required number of participants was 5 to 10 times the number of items (Ishii, 2007), the number of participants with the largest number of items in the scale used in this research was 25. Therefore, the number of participants was 125 to 250. Based on the survey of Fumoto & Horiuchi (2014), the expected response rate was set at about 55%, and the number of questionnaire distributed was set for about 460 people.

### **3. Methods**

#### **1) Data collection method**

##### **(1) Data collection period**

The questionnaires were distributed from July to October 2016 after the approval by the St Luke's International University Ethics Review Committee, and



were collected until the end of November 2016.

## (2) Sample frame and Data collection methods

Facilities were classified by prefecture and the target facilities were extracted from these classifications. For the hospitals and clinics to be surveyed, which are medical institutions that can handle labor, I referred to the “Perinatal Medical Plaza” website operated by the Medical Reform Committee of the Japan Gynecologic Academy Association. For the maternity homes to be surveyed, I used the national midwifery list of the sites operated by the Japan Midwife Association.

## 2) Measuring tools

### (1) Midwives experienced traumatic stress: TSSM

TSSM, which was developed by the researcher, was used in this research. The reliability and validity of TSSM were verified in my preliminary study 3, and measurements were carried out using the four-level Likert scale of frequency and impact, and calculated degree of trauma for the same item in all 16 items. The total score of frequency was scored from 0 to 48 points; a higher score indicated more traumatic stress experiences they had. The total score of impact was scored from 16 to 64 points; a higher score indicated more hurt from traumatic stress experiences. Regarding impact score, items that they have not experienced were considered 0 point. Therefore, the score range of impact in the analysis was 0 to 64. The degree of trauma was multiplied by frequency and impact, and the extent of degree of trauma was scored from 0 to 192 points. However, the numerical value of this score and the degree of trauma as the total of frequency and impact did not match.

In my preliminary study 2, TSSM had six factors and were interpreted as follows. The first factor was “Loss of Mother”, the second factor was “Regret about my Midwifery Practice”, the third factor was “Fetal death and assistance provided”, the fourth factor was “Loss of Baby”, the fifth factor was “Conflicting Thoughts over the Treatment Choice in the Perinatal Care Field”, and the sixth factor was “The Baby’s Life was Neglected”. However, in my preliminary study 3, TSSM four factors were obtained and interpreted as follows. The first factor was “Loss of

Baby”, the second factor was “Regret about my Midwifery Practice”, the third factor was “Loss of Mother”, and the fourth factor was “Value conflicts with Parents and Doctors”.

Evaluation of the reliability and validity was verified as follows. The reliability coefficient (Cronbach’s  $\alpha$  coefficient) was calculated to verify the reliability of TSSM. The Cronbach’s  $\alpha$  coefficient was  $\alpha = .848$  for the item with only frequency of all the 16 items,  $\alpha = .927$  for the item with only impact, and  $\alpha = .860$  for the degree of trauma, indicating a standard of internal consistency in all the cases. Furthermore, in the preliminary study 2, the Cronbach’s  $\alpha$  coefficient factor for each factor was  $\alpha = .882$  for the first factor,  $\alpha = .771$  for the second factor,  $\alpha = .790$  for the third factor,  $\alpha = .617$  for the fourth factor,  $\alpha = .587$  for the fifth factor, and  $\alpha = .545$  for the sixth factor. Also, the Pearson’s correlation coefficient of the 16 items of TSSM and CES-D was  $r = .208$  ( $p < 0.05$ ).

Moreover, I did not set a certain period of time at preliminary study, but most of the previous studies set a specific period of three months to one year for measuring life events. Considering rare events occurring in perinatal care such as maternal death or newborn mortality, I decided that it was easier to decipher the validity of TSSM when setting the assessment period for one year, thus in this research I asked about the events that happened in the past one year.

(2) Scale for measuring burnout: Japanese version of Maslach Burnout Inventory

I used the Japanese version of Maslach Burnout Inventory (MBI) developed by Kubo (2004). The original MBI developed by Maslach & Jackson (1981) was used for many studies of burnout. The Japanese version that was created by Tao (1987) consisted of 20 items based on the original MBI and were made to conform to the site of human service in Japan. Later, Kubo (1998) and Kubo & Tao (1994) added and deleted some items. The final scale developed by Kubo (2004) was composed of 17 items consisting of three factors: “depersonalization” (6 items), “emotional exhaustion” (5 items), and “decline of personal accomplishment” (6 items). Emotional exhaustion is the core symptom of burnout as exemplified by the feeling of being exhausted and the inability to work. Depersonalization indicates carrying

outcome passionate measures without respecting the individual. Also, a decline of personal accomplishment cannot maintain a feeling of having accomplished a good work, which leads to a low self-evaluation. I asked how frequently the content of the question items occurred and used the 5-level Likert scale for scoring the answers as follows: “1: not at all” to “5: always feel”. The total score (range, 17-85) was evaluated.

(3) Scale for measuring work engagement: Japanese version of UWES

There were three types of measurements scale of work engagement, and these were verified in terms of reliability and validity. In the present research, I used the scale based on Utrecht Work Engagement Scale (UWES) (Schaufeli, Taris, & Bakker 2002), a shortened and Japanese version UWES which was translated by Shimazu et al. (2008) of which the reliability and validity were verified. This scale consists of three sub-factors, namely, “vigor”, “dedication”, and “absorption”, and consists of a total of 17 items. The short version consists of nine items of three subordinate scales, with three items each, and a higher total score indicated a higher work engagement.

(4) Scale for measuring social support: social support scale for workplace

To determine the support system midwives use when they experience hurt, the social support scale for the workplace by Komaki et al. (1993) was used. The social support scale for the workplace by Komaki et al. (1993) is based on items that have been modified so that they can be applied to support of bosses, seniors, and colleagues in the workplace, taking into account the contents of existing scales related to social support. The scale by Komaki et al. (1993) has been categorized into the emotional support and instrumental support subscales according to the function of support. The contents of the questionnaires of emotional support consist of items related to the classifications “emotional support” and “evaluation support” according to House (1981). Similarly, when I evaluated the contents of the questionnaires of instrumental support, they consist of “Household support” and “information support” according to House (1981). In the present research, I set up two supporting routes, namely, “from the boss” and “from the colleagues”. The boss support consists of 15

items, whereas the colleague's support consists of 13 items. Each question was scored using the 5-level Likert scale from "1: I do not think so" to "5: I think so" as score points with 15-75 points for the boss and 15-65 points for the colleagues, with a higher score indicating that they have received the support system. Internal consistency was secured by Cronbach's  $\alpha = .94$  for the boss,  $\alpha = .93$  for the colleagues. Constructive validity was ensured owing to the negative correlation with the stress response.

(5) Specific support of stakeholders by medical institutions (hereinafter called specific support)

I considered as a good practice five methods of specific support from stakeholders of medical institutions, which are published in the brochure "Response to unexpected death or stillbirth caused by medical care (2015)" published by the Japan Nursing Association. The five methods are as follows: 1) "My boss told accurate information to my colleagues"; 2) "I was able to provide an environment so that I can calm down"; 3) "Boss confirmed my feelings and arranged the work environment and the department in which I worked"; 4) "I was able to adjust to stay with my friends, family, and colleagues even after I came home", and 5) "Depending on my feelings, my boss provided support so that I can look back on what happened and organize my feelings". I asked whether the midwife actually received that support after experiencing the traumatic stress as listed in TSSM, with their responses measured using the five items of the four-level Likert scale (i.e., "4: *I always think so*" to "0: *I totally do not think so*").

(6) Factors that directly cause trauma (hereinafter called direct trauma)

In the process of the scale development, there were originally 58 measurement items in the scale which included experiences such as "unreasonable reprimand and attitude from the doctor" and "harassment from the boss". However, it also included indirect traumatic stress of midwives when they are exposed to the traumatic stress experienced by pregnant woman. Eight items that indicated direct trauma (direct trauma experience) were subsequently deleted from the scale (see 2. Scale development process P.21). I hypothesized that a midwife who experiences neonatal

asphyxia and maternal sudden changes may experience burnout if the doctor passes the responsibility to the midwife, the midwife was abused, or if the midwife was not able to obtain support from the boss. From the eight items deleted, I excluded the items that can be measured by the social support scale, and for factors causing direct trauma, I measured them using the four-level Likert scale (4: often ~ 1: never). The remaining five items were as follows: 1. “I was reprimanded unreasonably by a doctor”, 2. “I received a non-aid attitude from a doctor”, 3. “I was reprimanded by my boss unreasonably”, 4. “I got unfair treatment from my boss”, and 5. “I received unfair treatment from my colleagues”.

(7) Scale for measuring resilience: Japanese version of The Connor-Davidson Resilience Scale (CD-RISC)

In the present research, I used the Japanese version of The Connor-Davidson Resilience Scale (CD-RISC) prepared by Nakajima et al. (2010). CD-RISC is a measurement scale that extracts characteristics of “resilient” people as originally developed by Connor and Davidson (2003). This was a 5-level scale (i.e., “0: Totally nonapplicable” to “4: Almost always applicable”) measuring the level of fitness in the past five years using 25 question items. The scale has a total of 100 points, and it is a scale for measuring the level of resilience. This scale was confirmed by Connor et al. (2003) as Cronbach’s  $\alpha = .89$  for internal consistency, and ICC = .87 for the inspection - retest method. In addition, CD-RISC was translated into the Japanese version by Nakajima et al. (2010), with Cronbach’s  $\alpha = .94$ , and a significant correlation ( $r = .94$ ) was obtained with the test-retest method, thus ensuring reliability. Moreover, as a significant negative correlation ( $r = -.58$ ) was obtained with the subjective stress scale, convergent validity was secured. In addition, before using this measurement, I obtained permission to use the scale from Dr. Davidson.

(8) Scale for measuring emotional labor: emotional labor scale

In a review of recent studies of emotional labor, the idea that the concept of emotional labor is not only negative, but also positive was mainstream. In the results of previous studies, it was shown that the aspect of positive emotional expression was defensively related to burnout. Therefore, I used the emotional labor scale

(Ogino, Takigasaki & Inagi, 2004) whose reliability and validity have been confirmed and developed in reference to the Frankfurt emotional labor scale developed by Zapf et al. (1999), which can measure both sides. This scale measures the grade using a five-level Likert scale: “1 - never” to “5 - very often” for all 21 items.

(9) Labor productivity: Japanese version of HPQ short-form

The “HPQ short-form”, which is used for the evaluation of labor productivity (Kessler, 2004), is based on the “World Health Organization, Health and Labor Performance Questionnaire” that is used worldwide. In the present research, the Japanese translation (translation) and reverse translation were verified by Miyagi (2013), and three items evaluating presenteeism of the same short form questionnaire were measured. With reference to the website (<https://www.hcp.med.harvard.edu/hpq/>) on which the “World Health Organization Health and Labor Performance Questionnaire” was published, the higher the score measured, the lower the performance. Question items 1 and 3 indicated the percentage of performance. If this assumption is proved, the absolute presenteeism has a lower limit of 0 (shortage for the total performance during the working hours) and an upper limit of 100 (there is no performance shortage during the working hours). Relative presenteeism showed the ratio of most workers’ accomplishments and their achievements at the same job. Therefore, it is recommended to limit the distribution of relative presenteeism to the range of 0.25 to 2.0. The relative worst performance is 0.25 (< 25% of the performance of other employees); the best performance is 2.0 (> 200% of the performance of other employees).

The calculation method is as follows. Question 2 provided a clue to recall Question 3 and was not used for the actual calculation.

① Measurement method of absolute presenteeism

Absolute presenteeism (%) = “Question 3” × 10 (Range = 0%-100%)

Absolute presenteeism loss rate (%) = 100 - absolute presenteeism

② Relative presenteeism (ratio with colleagues / others)

Relative presenteeism = “Question 3” / “Question 1”

Relative presenteeism converts less than 1.0 to 1.0 and sets the range to 0.25-1.0.

In addition, relative presenteeism deficit was calculated by complementing the average value of relative presenteeism.

#### (10) Intention to stay

I asked the target midwives to choose one of the following options as intention to stay: 1) “I want to continue working in the same department (midwife) until the retirement”, 2) “I want to continue working in the same department (maternity clinic) as much as possible”, 3) “I would like to continue working at the facility if boss rearrange my department”, 4) “I am considering retirement from my facility (maternity center)”, and 5) “I want to quit my midwifery job”. I made a blank space where the target midwives could describe the reason for choosing the corresponding item. “I want to continue working in the same department (maternity hospital) until retiring” was assigned as 4, and “I want to quit my job as a midwife” was assigned as 0; a higher score indicated a higher willingness to continue working.

#### (11) Demographic data

I referred to the study of Iguchi (2016) who investigated the relationship between job resources and work engagement for public health nurses. Considering the data with which the association was observed, I considered it from the three aspects of basic attributes, individual factors, and organizational factors. Basic attributes consisted of age, marital state, and living with family. Individual factors encompassed job position, number of years of employment as a midwife, midwifery educational background, and CLoCMiP level III acquisition. The organization factors included workplace and hospital wards.

### 4. Procedure

#### 1) Preliminary survey

As a preliminary survey, I conducted pretests for postgraduate students and employment midwives who have experience working as midwives and revised the structure of the questionnaires, the mode of replying, the expression, and the arrangement

of scales.

## 2) Distribution of questionnaire and data collection

(1) Distribution of the questionnaires and request for data collection and research cooperation involved providing a description of the research purpose and survey procedure to the nursing department manager or facility chief at the surveyed facility (Appendix 1). It also necessitated a research request document and questionnaire (Appendix 2) for the subject, a reply postcard (Appendix 3), an explanation of the purpose and significance of this research, seeking cooperation for research, indicating intention to participate in the reply postcard, and the number of midwives who can cooperate with the research.

(2) A research request document, a questionnaire, and a reply envelope for the number entered in the postcard were sent to each cooperating research facility.

(3) The researcher provided a detailed explanation of the purpose and significance of the research and the investigation method as needed.

(4) The research request document and questionnaire, reply envelope, gift item from the nursing department manager or facility chief, and request for research cooperation were provided to the target midwife. Distribution to the midwife who is currently experiencing traumatic stress at the time of distribution was requested to be avoided.

(5) The questionnaire was about the contents of a traumatic stress experience. The total number of questionnaires including explanatory texts was 11, the number of contributions was ten, and the required time was about 20 minutes.

(6) It was clearly stated in the research request document to place the document in the reply envelope and seal the envelope, and to enclose the answered questionnaire individually and mail it.

## 5. Data analysis method

The basic statistics of each variable were calculated. In addition, calculate correlation coefficients to measure whether frequency, impact, and degree of trauma are related to burnout or work engagement.



Moreover, I analyze the interaction effect in relation to frequency, impact, and degree of trauma to burnout and work engagement with the method of hierarchical multiple regression analysis. For this analysis TSSM was taken as an independent variable and “burnout and work engagement” were taken as dependent variables. I hypothesized that the following six positive and negative variables could have been affected by the TSSM: (1) boss support, (2) colleague support, (3) five items as the specific support of stakeholders by the medical institution proposed by the Japan Nursing Association (specific support). I made those five items into continuous variables of one to five indicating how much midwives it received, (4) “factors causing direct trauma” that included the items - when midwives experienced traumatic stress, they got a ‘rough’ or unreasonable response from doctors or superiors, reprimand, etc., and how much midwives experienced that situation was inputted as a continuous variable of one to five, (5) resilience, and (6) emotional labor. There are interactions between two continuous variables, which can take three typical patterns (Cohen et al., 2003: 285–286): (a) enhancing interactions, in which both the predictor and moderator affect the outcome variable in the same direction and together they have a stronger effect than a merely additive one; (b) buffering interactions, in which the moderator variable weakens the effect of the predictor variable on the outcome; and (c) antagonistic interactions, in which the predictor and moderator have the same effect on the outcome but the interaction is in the opposite direction. Based on the above definition, (1), (2), (3), and (5) were taken as buffering interaction, and (4), and (5) were taken as enhancing interactions. Based on the conceptual framework of this research, to measure the relationship between burnout and work engagement and labor productivity, burnout and work engagement and intention to stay, Pearson's correlation coefficient was calculated.

The statistical significance level was set at 5% for two-sided tests, and SPSS Statistics Version 24.0 for Windows was used for data analysis. A statistical expert was consulted to confirm the analysis results.

## 6. Ethical considerations

All processes stipulated in the research must have the following contents in compliance with ethical principles.

- 1) Participation in this research is based on the free will of research collaborators, and there is absolutely no disadvantage even if you refuse to participate in the research.
- 2) Answers to the questionnaire and envelopes for reply shall be anonymous, ensuring anonymity and privacy of research collaborators.
- 3) The obtained data should be used for research purposes only.
- 4) To strictly manage materials, information, and data collected or generated for research for three years after the end of the research. All personal information was made anonymous. After saving, all data were cut and discarded.
- 5) Store the obtained data in a locked USB with a password known only by the researchers.
- 6) After summarizing this study as a research for a postgraduate doctoral thesis, it is scheduled to be published in a conference proceeding or a specific journal, enabling protection of privacy such that individuals and facilities are not specified.
- 7) The results of this research should be announced as early as possible (academic presentations and papers), and research collaborators can know the results.
- 8) This research was conducted after receiving approval from the Research Ethics Review Committee of St. Luke's International University (approval number: 17-A 005).
- 9) Some disadvantages predicted by the research collaborators and their correspondence are as follows:

The questionnaire was about the traumatic stress of midwives and it was thought that recalling the traumatic stress posed the danger of affecting their mental health. Therefore, when distributing questionnaires, I asked the persons in charge of the target facility to take care in distributing to the midwives who are currently experiencing trauma. In addition, when collaborators wanted psychological support, they sought counseling from an expert (i.e., social worker/family counselor: Ms. Keiko Ishii) at an early stage and made a statement to that effect on the front page of the questionnaire.

## Chapter VI Results

I asked for research cooperation from 322 facilities in 47 prefectures nationwide and 101 facilities, from 41 prefectures agreed to cooperate (31.4%). The facilities consisted of: comprehensive perinatal maternal and child medical center, regional perinatal maternal and child medical center, general hospital, clinic, maternity home, and university. The breakdown of the 101 facilities was as follows: 35 comprehensive perinatal maternal and child medical center, 14 regional perinatal maternal and child medical center, four general hospitals, nine clinics, and 39 maternity homes. Moreover, there were 1,083 midwives in the 101 cooperating facilities. I obtained responses from 652 midwives (60.2%). Of these 652, excluding 141 who had a deficit on the TSSM scale, thus 511 effective respondents (response rate: 47.2%) were finally enrolled.

### 1. Sample and demographic characteristic (Table 5)

The ages ranged from 21 to 76 years, with an average age of 38.1 years ( $SD = 11.0$ ), 30.1% were in their 30s and 24.3% in their 40s; half of them were in their 30s and 40s. The average number of years of employment as a nurse (including midwives) was 13.0 years ( $SD = 9.6$ ), in the range of 1 to 52 years; the number less than five years was the largest 28.4%, followed by 11 years and less than 20 years was 26.4%. The current workplaces were as follows: 360 (70.5%) at perinatal maternal and child medical centers and 50 (9.8%) at general hospitals, thus hospitals accounted for about more than 80% of the total workplaces. Other clinics and midwifery homes were about 10%. The wards of midwives working in hospitals were 310 (60.7%) in obstetrics, 65 (12.7%) in obstetrics and gynecology, and 53 (10.4%) in mixed wards of obstetrics and other departments. In addition, the staff midwives were 387 (75.7%), the middle managers were 70 (13.7%), and the managers 44 (8.6%). There were 201 midwives (39.3%) acquired the title of Advanced Midwife of CLoCMiP level III. As for the midwifery educational background, 240 (47.0%) attended midwifery training school, 98 (19.2%) junior college, 109 (21.3%) university, 39 (7.6%) non-degree course for graduates, and 20 (3.9%) graduate school. There were 279 (54.6%) married and midwives who lived

with their families were 356 (69.7%).

Table 5  
*Demographic characteristics among midwives (N = 511)*

		<i>n</i>	<i>%</i>
Age	average	38.1( <i>SD</i> = 11.1)	
	21-29	186	28.6
	30-39	198	30.5
	40-49	161	24.8
	50-59	75	11.5
	60-76	25	3.8
	No response	5	0.8
Number of years of employment as a nurse	average	13.0( <i>SD</i> = 9.8)	
	1-5 y	185	28.5
	6-10 y	138	21.2
	11-20 y	183	28.2
	21-30 y	95	14.6
	31-52 y	40	6.2
	No response	9	1.4
Current workplaces	Perinatal maternal and child medical cen	466	71.7
	General hospital	63	9.7
	Clinics	43	6.6
	Maternity homes	67	10.3
	Others	6	0.9
	No response	5	0.8
Hospital ward	Obstetrics	403	62.0
	Obstetrics and gynecology	83	12.8
	Obstetrics and gynecology and other	67	10.3
	Obstetrics and other	2	0.3
	No response	95	14.6
Position	Management	53	8.2
	Middle management	88	13.5
	Staff	499	76.8
	No response	10	1.5
CLOCMiP Level III	Acquirer	260	40.0
	Non-acquirer	386	59.4
	No response	4	0.6
Midwifery educational background	Attended midwifery training school	303	46.6
	Junior college	127	19.5
	University	142	21.8
	Non-degree course for graduates	50	7.7
	Graduate school	24	3.7
	No response	4	0.6
Marital status	Yes	348	53.5
	No	299	46.0
	No response	3	0.5
Living with family	Yes	449	69.1
	No	199	30.6
	No response	2	0.3

## 2. Characteristics of traumatic stress in midwives

### 1) Traumatic stress experience with frequency, impact, and degree of trauma (Table 6)

Looking at the frequency, the item with the highest frequency average value was “Disregarded oneself when providing care (1.70)”. After that, “Experience intrauterine fetal death (1.48)”, “I cannot understand target's remarks or thoughts (1.35)”, “I was disappointed with myself that cannot do anything in an emergency (1.28)”, and “The tearful appearance and their expression of parents who lost their child (1.26)”. The average value of total score for frequency of traumatic experience per person was 14.29 ( $SD = 6.2$ , range 0-32). The minimum value of the frequency score was 0 and the maximum value was 32.

In terms of the impact, the item with the highest impact average was “Experience intrauterine fetal death (2.84)”. After that, “Disregarded oneself when providing care (2.80)”, “Incidents I think I caused (2.77)”, “I was disappointed with myself that cannot do anything in an emergency (2.76)”, and “The tearful appearance and their expression of parents who lost their child (2.63)”. The average value of total score of impact for traumatic experience was 31.06 ( $SD = 11.9$ , range 0-64). The minimum value of the impact score was 0 and the maximum value was 64.

In terms of the degree of trauma which is multiplied by frequency and impact, the item in descending by average were: “Disregarded oneself when providing care (5.04)”, “Experience intrauterine fetal death (4.74)”, “I was disappointed with myself that cannot do anything in an emergency (4.41)”, “The tearful appearance and their expression of parents who lost their child (4.23)”, and “Incidents I think I caused (3.95)”. The average of the total score of degree of trauma for traumatic experience was 45.45 ( $SD = 21.6$ , range 0-127). The minimum value of the degree of trauma score was 0 and the maximum value was 127.

Table 6

*Average value of frequency, impact and degree of trauma of TSSM (N = 511)*

	frequency	impact		degree of trauma
		mean ( <i>SD</i> )	mean ( <i>SD</i> )	
1 Experience neonatal death	0.92 (0.7)	2.28 (1.6)	2.99 (2.5)	
2 Experience intrauterine fetal death	1.48 (0.8)	2.84 (1.2)	4.74 (2.8)	
3 Assistance of stillbirth	0.96 (0.9)	2.13 (1.7)	3.22 (3.0)	
4 Experience maternal death	0.36 (0.5)	1.23 (1.7)	1.26 (1.8)	
5 I was disappointed with myself that cannot do anything in an emergency	1.28 (0.9)	2.76 (1.4)	4.41 (3.3)	
6 Negative emotions of mothers caused by myself	0.79 (0.7)	2.15 (1.6)	2.55 (2.2)	
7 Disregarded oneself when providing care	1.7 (0.8)	2.8 (0.8)	5.04 (2.7)	
8 Incidents I think I caused	1.15 (0.8)	2.77 (1.4)	3.95 (2.8)	
9 Baby's life was neglected by the doctor	0.25 (0.5)	0.73 (1.4)	0.87 (1.9)	
10 Baby's life was neglected by their family	0.48 (0.6)	1.36 (1.7)	1.56 (2.1)	
11 Assistance of induced abortion	0.9 (0.9)	1.86 (1.6)	2.84 (2.9)	
12 Inconsistent treatment policy	0.95 (0.7)	2.02 (1.4)	2.75 (2.5)	
13 I cannot understand target's remarks or thoughts	1.35 (0.7)	2.3 (1.0)	3.5 (2.4)	
14 The tearful appearance and their expression of parents who lost their child	1.26 (0.9)	2.63 (1.5)	4.23 (3.1)	
15 A sorrowful appearance of the family whose mother died	0.28 (0.6)	0.7 (1.4)	0.93 (2.0)	
16 Sadness of the father who was left behind	0.18 (0.5)	0.5 (1.2)	0.61 (1.6)	
Average value of total score of TSSM		14.29 (6.2)	31.06 (11.9)	
			45.45 (21.6)	

2) One-way analysis of variance with respondents' attributes and frequency, impact, and degree of trauma (**Table 7**)

I conducted one-way analysis of variance with frequency, impact, and degree of trauma as dependent variables, current workplaces, position, midwifery educational background, marital status, living with family, and CLoCMiP level III as independent variables.

First, there was a significant difference in frequency, impact, and degree of trauma by current workplaces ( $p < 0.001$ ). The highest in all was the perinatal medical center, followed by general hospitals, clinics and maternity homes. Similarly, there was a significant difference in the average of frequency and impact of trauma by position ( $p < 0.05$ ), the highest was in the middle management, then the staff, and the managerial position. In the marital status, the average of frequency ( $p < 0.01$ ), impact ( $p < 0.05$ ), and degree of trauma ( $p < 0.01$ ) were significantly higher for unmarried than for married. Finally, with regard to living with family members, the average score of frequency ( $p < 0.01$ ) and degree of trauma ( $p < 0.05$ ) was significantly higher than those without living with family compared with living with them.

However, there was no significant difference in frequency, impact, and degree of trauma by midwifery education background and CLoCMiP level III.



Table 7

*ANOVA with respondents' attributes and TSSM (N = 511)*

		frequency		impact		degree of trauma	
		score(SD)	p	score(SD)	p	score(SD)	p
Current workplaces	Perinatal maternal and child medical centers	15.61(5.4)		33.56(10.4)		49.66(19.4)	
	General hospitals	14.22(6.0)	***	30.52(10.3)	***	45.24(21.8)	***
	Clinics	10.91(6.5)		25.31(14.7)		35.94(23.6)	
	Maternity homes	8.37(5.9)		20.03(12.8)		25.92(20.1)	
Position	Management	12.07(7.8)		27.59(15.6)		38.70(28.1)	
	Middle management	15.29(5.8)	*	33.80(10.9)	*	48.04(19.9)	
	Staff	14.36(6.0)		30.96(11.9)		45.74(21.0)	
Marital status	Yes	13.54(6.3)	**	30.07(12.8)	*	43.08(22.5)	**
	No	15.21(5.8)		32.29(10.7)		48.39(20.1)	
Living with family	Yes	13.80(6.3)	**	30.45(12.3)		43.93(22.0)	*
	No	15.45(5.6)		32.51(10.9)		49.03(20.2)	
Midwifery educational background	Attended midwifery training school	13.98(6.1)		30.67(11.6)		44.43(21.2)	
	Junior college	14.50(6.6)		31.58(13.4)		45.44(22.8)	
	University	14.78(5.8)		31.87(11.3)		47.59(21.7)	
	Non-degree course for graduates	15.08(6.1)		31.10(11.1)		48.69(20.9)	
	Graduate school	12.75(6.2)		28.90(13.7)		40.05(20.8)	
CLOCMiP Level III	Acquirer	14.39(6.2)		31.81(12.6)		45.38(21.9)	
	Non-acquirer	14.22(6.1)		30.58(11.5)		45.49(21.4)	

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

3. The relationship between TSSM and “burnout and work engagement” (**Table 8**)

Pearson's correlation coefficient value with burnout and work engagement was calculated for frequency, impact, and degree of trauma.

There was a positive correlation ( $r = .26, p < 0.001$ ) with frequency and burnout, and a negative correlation ( $r = -.15, p < 0.01$ ) with frequency and work engagement.

Next, there was a positive correlation ( $r = .24, p < 0.001$ ) with impact and burnout, and a negative correlation ( $r = -.10, p < 0.05$ ) with impact and work engagement.

There was a positive correlation ( $r = .27, p < 0.001$ ) with degree of trauma and burnout, a negative correlation ( $r = -.13, p < 0.01$ ) with degree of trauma and work engagement.

Table 8

*Intercorrelations between TSSM, burnout, and work engagement (N = 511)*

Variable	burnout	workengagement
1 frequency	0.26 ***	-0.15 **
2 impact	0.24 ***	-0.10 *
3 degree of trauma	0.27 ***	-0.13 **

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

#### 4. Interaction effect of environmental factors and individual factors in TSSM and “burnout and work engagement”

Hierarchical multiple regression analysis using interaction terms was carried out to investigate whether these six variables could be related to TSSM (frequency, impact and degree of trauma) and “burnout and work engagement”. First, 12 matches were made as to whether six variables could be related in the relationship between TSSM as an independent variable, and “burnout and work engagement” as dependent variables.

To create interaction terms of TSSM and six variables, the mean values of six variables were calculated using central tendencies. Then, the average value was subtracted from the value of each respondent, and a new variable was created. After that, I multiplied each of the centered six variables.

Next, I refer to the block of hierarchical multiple regression analysis. In step one, each factor of TSSM and one of the six variables were inputted for the main effect. In step two, to measure the interaction effect, an interaction term multiplied by the two variables entered in step one and was inputted. Then, in step three, to control the influence of the attributes, five adjustment dummy variables were inputted: marital state, living with family, work place, job title, and number of years of employment.

##### 1) The relationship between frequency and “burnout and work engagement”

First of all, the relationship between frequency and burnout was explored. There were significant main effects of frequency even though the attributes in the model were controlled and the variables are as follows: boss support, colleague support, specific support, and resilience. The six variables showed a significant main effect in all although the attributes were controlled. Regarding the interaction effect, the interaction term of frequency and boss support ( $b = -.010, p < 0.05$ ), frequency and colleagues support ( $b = -.013, p < 0.05$ ), frequency and specific support ( $b = -.044, p < 0.05$ ), frequency and direct trauma ( $b = .055, p < 0.05$ ), and frequency and emotional labor ( $b = .016, p < 0.01$ ) showed a significant interaction effect with burnout.

Next was the relationship between frequency and work engagement. There were no significant main effects of frequency when attributes were controlled. The six

variables showed a significant main effect for work engagement, boss support, colleague support, specific support, resilience, and emotional labor. However, there was no significant interaction effect in relationship between frequency and work engagement (**Table 9**).

Table 9

*Hierarchical multiple regression analyses burnout and work engagement with frequency (N = 511)*

Variable	burnout		work engagement	
	Step 3		Step 3	
	<i>b</i>	<i>b SE</i>	<i>b</i>	<i>b SE</i>
Step 1				
frequency	0.160 *	0.072	0.027	0.068
boss support	-0.197 ***	0.032	0.143 ***	0.030
Step 2				
frequency × boss support	<b>-0.010 *</b>	0.005	-0.002	0.004
$R^2$	0.253		0.222	
$\Delta R^2$	0.110 ***		0.142 ***	
Adj $R^2$	0.235		0.203	
Step 1				
frequency	0.168 *	0.072	0.019	0.068
colleagues support	-0.284 ***	0.043	0.224 ***	0.040
Step 2				
frequency × colleagues support	<b>-0.013 *</b>	0.006	0.001	0.006
$R^2$	0.262		0.234	
$\Delta R^2$	0.128 ***		0.163 ***	
Adj $R^2$	0.244		0.216	
Step 1				
frequency	0.190 *	0.074	0.012	0.068
specific support	-0.425 ***	0.109	0.381 ***	0.101
Step 2				
frequency × specific support	<b>-0.044 *</b>	0.018	0.023	0.016
$R^2$	0.218		0.211	
$\Delta R^2$	0.113 ***		0.145 ***	
Adj $R^2$	0.199		0.191	
Step 1				
frequency	0.053	0.076	0.027	0.073
direct trauma	0.923 ***	0.172	-0.109	0.165
Step 2				
frequency × direct trauma	<b>0.055 *</b>	0.025	-0.014	0.024
$R^2$	0.249		0.188	
$\Delta R^2$	0.127 ***		0.164 ***	
Adj $R^2$	0.231		0.169	
Step 1				
frequency	0.256 ***	0.069	-0.061	0.060
resilience	-0.247 ***	0.025	0.292 ***	0.022
Step 2				
frequency × resilience	-0.002	0.004	0.003	0.003
$R^2$	0.323		0.408	
$\Delta R^2$	0.061 ***		0.066 ***	
Adj $R^2$	0.306		0.394	
Step 1				
frequency	0.128	0.074	-0.016	0.070
emotional work	0.179 ***	0.038	0.089 *	0.036
Step 2				
frequency × emotional work	<b>0.016 **</b>	0.006	-0.006	0.006
$R^2$	0.232		0.198	
$\Delta R^2$	0.120 ***		0.166 ***	
Adj $R^2$	0.214		0.179	

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

Next, since the interaction term of boss support, colleagues support, specific support direct trauma, and emotional work was significant, I performed a simple slope analysis. As a procedure of analysis, firstly, standard deviation was calculated in order to prepare new variables as high group and low group of specific support, and then calculated as follows.

boss support high = centering boss support score – (+1SD)

boss support low = centering boss support score – (–1SD)

After that, I created a new variable representing the product of centering frequency and boss support high, centering frequency and boss support low. Multiple regression analysis was performed with these variables as independent variables and burnout as the dependent variable.

The results of the simple slope analysis (**Figure 5**) showed that the higher frequency had a significantly higher burnout state scores than the lower frequency in low boss support (mean-1SD) ( $p < 0.01$ ) and high boss support (mean+1SD) ( $p < 0.01$ ).

Colleagues support was also computed the same way. The results of the simple slope analyses (**Figure 6**) showed that the higher frequency had a significantly higher burnout state scores than lower frequency in low colleagues support (mean-1SD) ( $p < 0.01$ ) and high colleagues support (mean+1SD) ( $p < 0.01$ ).

The results of the simple slope analysis (**Figure 7**) showed that the higher frequency had a significantly higher burnout state scores than the lower frequency in low specific support (mean-1SD) ( $p < 0.01$ ) and high specific support (mean+1SD) ( $p < 0.01$ ).

The results of the simple slope analysis (**Figure 8**) showed that the higher frequency had a significantly higher burnout state scores than the lower frequency in low direct trauma (mean-1SD) ( $p < 0.05$ ) and high direct trauma (mean+1SD) ( $p < 0.01$ ).

The results of the simple slope analyses (**Figure 9**) showed that the higher frequency had a significantly higher burnout state scores than lower frequency in low emotional work (mean-1SD) ( $p < 0.05$ ) and high emotional work (mean+1SD) ( $p < 0.01$ ).

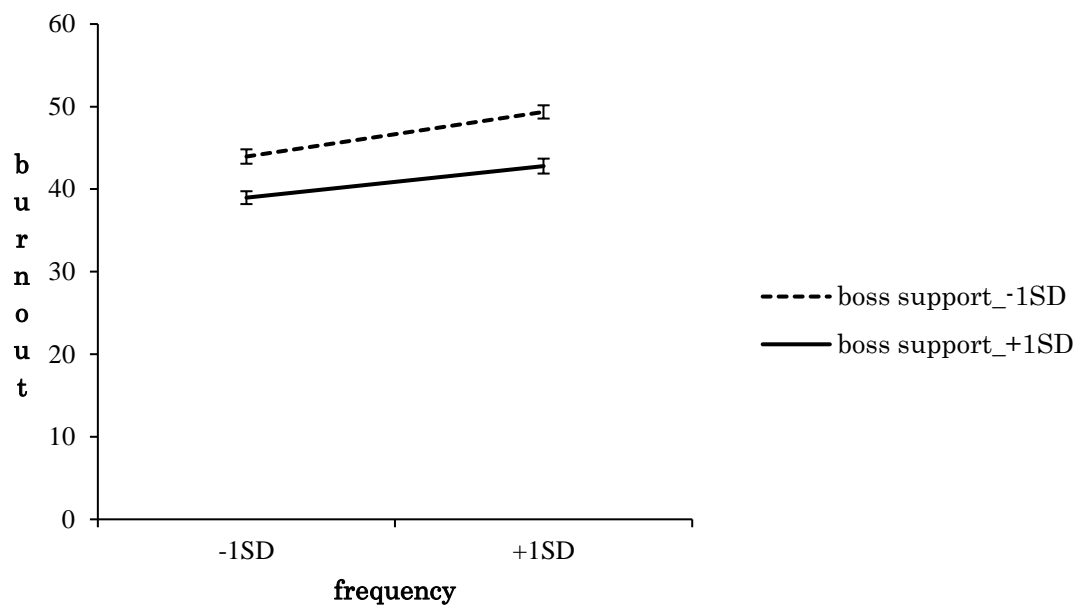


Figure 5. Interaction effect of frequency and boss support on burnout.



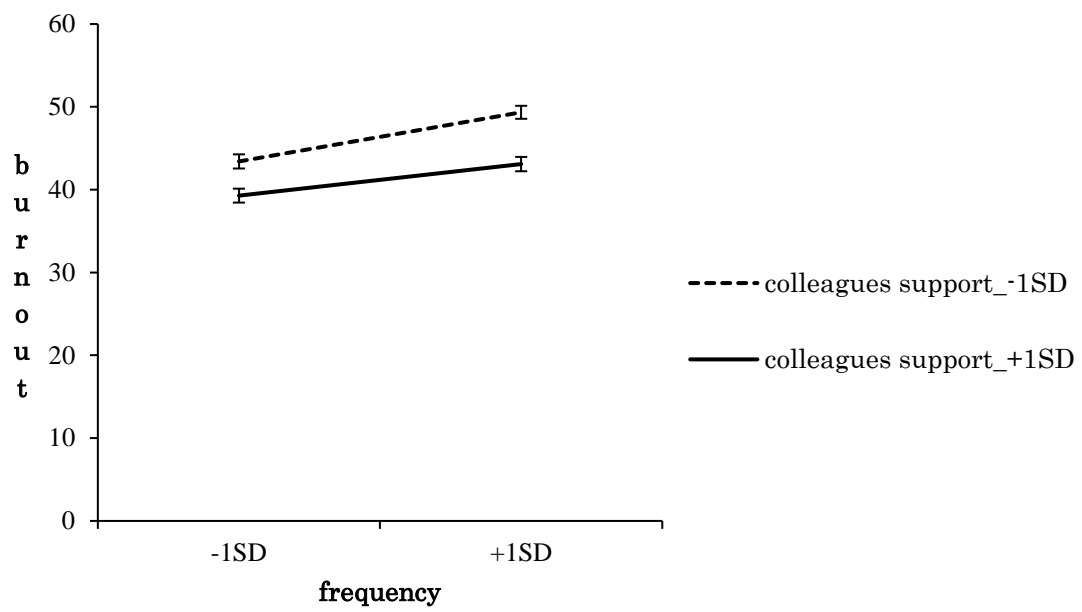


Figure 6. Interaction effect of frequency and colleague support on burnout.

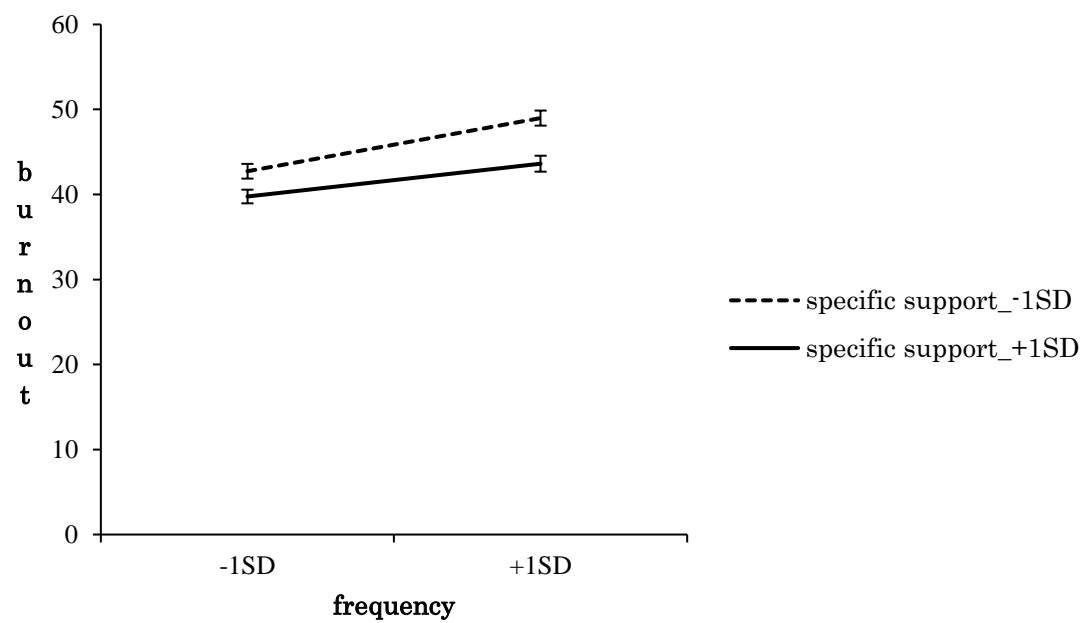
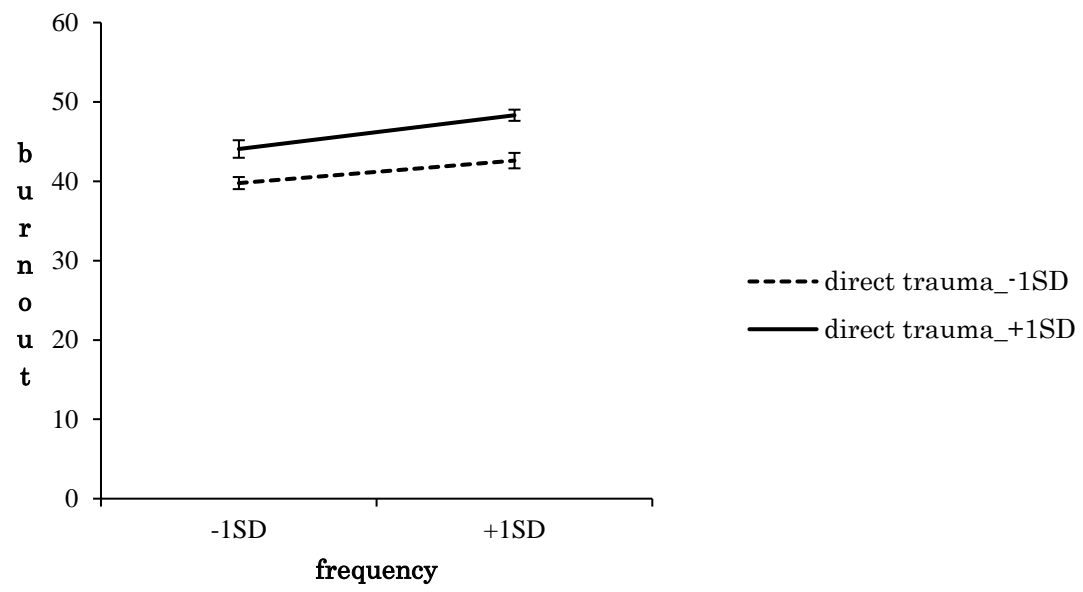
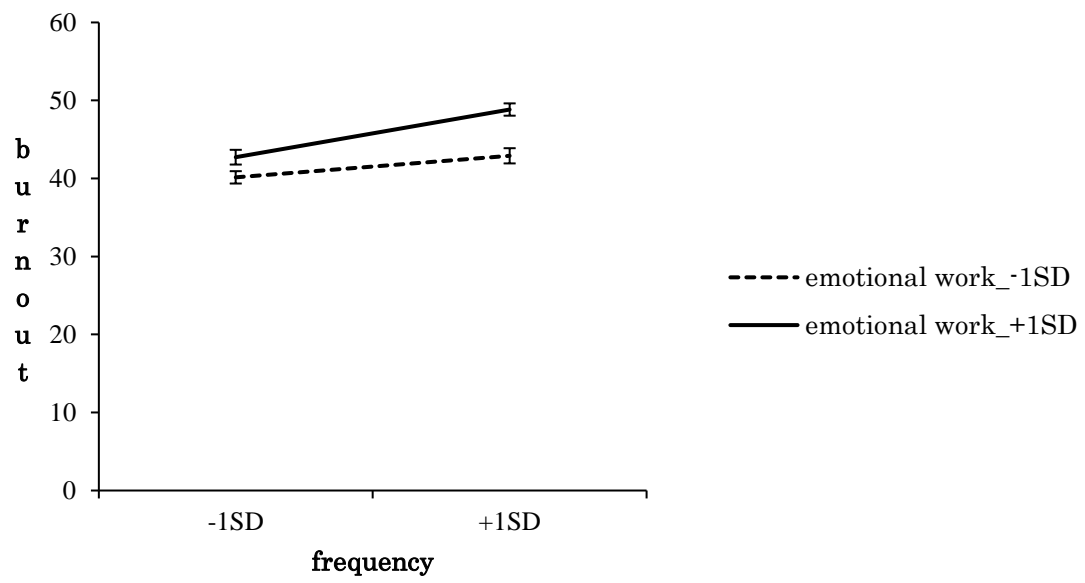


Figure 7. Interaction effect of frequency and specific support on burnout.



*Figure 8. Interaction effect of frequency and direct trauma on burnout.*



*Figure 9. Interaction effect of frequency and emotional work on burnout.*

2) The relationship between impact and “burnout and work engagement”

First of all, the relationship between impact and burnout was explored. There were significant main effects of impact even though the attributes in the model were controlled and the variables was resilience. The six variables showed a significant main effect in all although he attributes were controlled. Regarding the interaction effect, the interaction term of impact and specific support ( $b = -.019, p < 0.05$ ) showed a significant interaction effect with burnout.

Next was the relationship between impact and work engagement. There were no significant main effects of impact when attributes were controlled. The five variables showed a significant main effect for work engagement, boss support, colleague support, specific support, resilience, and emotional labor. However, there was no significant interaction effect in relationship between impact and work engagement (**Table 10**).

Table 10

*Hierarchical multiple regression analyses burnout and work engagement with impact (N = 511)*

Variable	burnout		work engagement	
	Step 3		Step 3	
	<i>b</i>	<i>b SE</i>	<i>b</i>	<i>b SE</i>
Step 1				
impact	0.078 *	0.037	0.043	0.035
boss suppoort	-0.201 ***	0.032	0.143 ***	0.030
Step 2				
impact × boss support	-0.004	0.002	-0.002	0.002
$R^2$	0.248		0.226	
$\Delta R^2$	0.112 ***		0.151 ***	
Adj $R^2$	0.230		0.207	
Step 1				
impact	0.069	0.037	0.050	0.035
colleagues suppoort	-0.281 ***	0.043	0.226 ***	0.040
Step 2				
impact × colleagues support	-0.006	0.003	0.001	0.003
$R^2$	0.258		0.237	
$\Delta R^2$	0.136 ***		0.178 ***	
Adj $R^2$	0.240		0.219	
Step 1				
impact	0.093 *	0.038	0.036	0.035
specific support	-0.422 ***	0.109	0.371 ***	0.101
Step 2				
impact × specific support	<b>-0.019 *</b>	0.009	0.007	0.008
$R^2$	0.215		0.210	
$\Delta R^2$	0.116 ***		0.155 ***	
Adj $R^2$	0.196		0.191	
Step 1				
impact	0.017	0.039	0.051	0.037
direct trauma	0.997 ***	0.174	-0.199	0.166
Step 2				
impact × direct trauma	0.008	0.013	0.005	0.012
$R^2$	0.242		0.191	
$\Delta R^2$	0.126 ***		0.172 ***	
Adj $R^2$	0.224		0.171	
Step 1				
impact	0.126 ***	0.035	-0.002	0.030
resilience	-0.248 ***	0.025	0.291 ***	0.022
Step 2				
impact × resilience	-0.002	0.002	0.002	0.002
$R^2$	0.323		0.408	
$\Delta R^2$	0.065 ***		0.075 ***	
Adj $R^2$	0.306		0.393	
Step 1				
impact	0.061	0.038	0.024	0.036
emotional work	0.177 ***	0.038	0.085 *	0.036
Step 2				
impact × emotional work	0.005	0.003	-0.002	0.003
$R^2$	0.225		0.198	
$\Delta R^2$	0.123 ***		0.180 ***	
Adj $R^2$	0.206		0.179	

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

The results of the simple slope analyses (**Figure 10**) showed that the higher impact had significantly higher burnout state scores than lower impact in high specific support (mean+1SD) ( $p < 0.01$ ) and in low specific support (mean-1SD) ( $p < 0.01$ ).

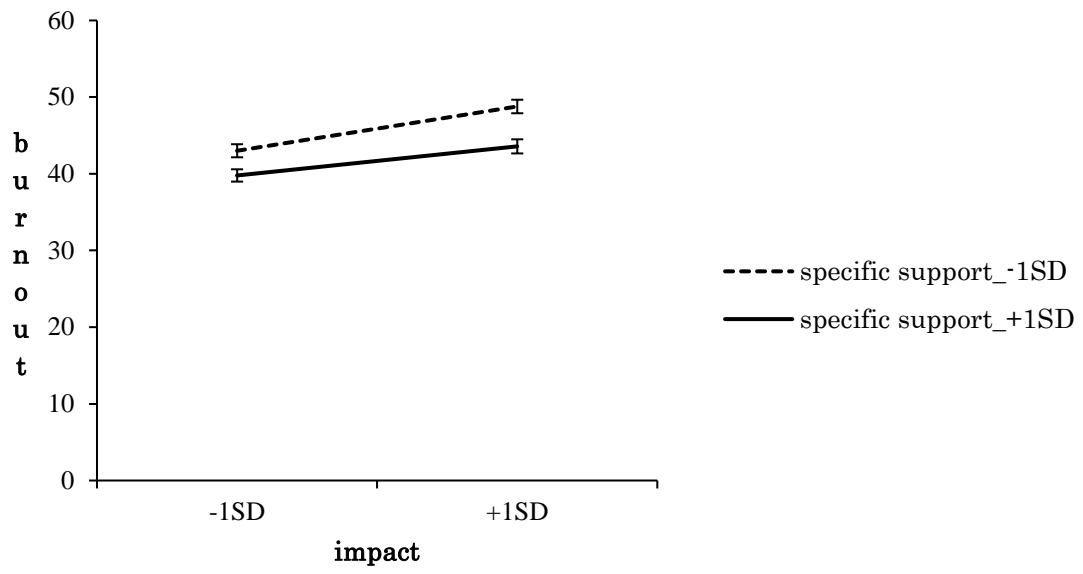


Figure 10. Interaction effect of impact and specific support on burnout.



3) The relationship between degree of trauma and “burnout and work engagement”

First of all, the relationship between degree of trauma and burnout was explored. There were significant main effects of degree of trauma even though the attributes in the model were controlled and the variables are as follows: boss support, colleague support, specific support, and resilience. The six variables showed a significant main effect in all although the attributes were controlled. Regarding the interaction effect, the interaction term of degree of trauma and boss support ( $b = -.004, p < 0.05$ ), degree of trauma and colleagues support ( $b = -.004, p < 0.05$ ), trauma and specific support ( $b = -.014, p < 0.01$ ), trauma and direct trauma ( $b = .015, p < 0.05$ ), and degree of trauma and emotional labor ( $b = .004, p < 0.05$ ) showed a significant interaction effect with burnout.

Next was the relationship between degree of trauma and work engagement. There were no significant main effects of degree of trauma when attributes were controlled. The five variables showed a significant main effect for work engagement, boss support, colleague support, specific support, resilience, and emotional labor. Regarding the interaction effect, the interaction term of degree of trauma and specific support ( $b = .010, p < 0.05$ ) showed a significant interaction effect with burnout. (**Table 11**).

Table 11

*Hierarchical multiple regression analyses burnout and work engagement with degree of trauma (N = 511)*

Variable	burnout		work engagement	
	Step 3		Step 3	
	<i>b</i>	<i>b SE</i>	<i>b</i>	<i>b SE</i>
Step 1				
degree of trauma	0.057 **	0.020	0.010	0.019
boss support	-0.191 ***	0.032	0.141 ***	0.030
Step 2				
degree of trauma × boss support	<b>-0.004 *</b>	0.002	0.001	0.002
$R^2$	0.259		0.222	
$\Delta R^2$	0.106 ***		0.147 ***	
Adj $R^2$	0.241		0.203	
Step 1				
degree of trauma	0.061 **	0.020	0.007	0.019
colleagues support	-0.283 ***	0.043	0.222 ***	0.041
Step 2				
degree of trauma × colleagues support	<b>-0.004 *</b>	0.002	0.001	0.002
$R^2$	0.270		0.235	
$\Delta R^2$	0.126 ***		0.166 ***	
Adj $R^2$	0.252		0.216	
Step 1				
degree of trauma	0.068 **	0.021	0.005	0.019
specific support	-0.432 ***	0.108	0.387 ***	0.101
Step 2				
degree of trauma × specific support	<b>-0.014 **</b>	0.005	<b>0.010 *</b>	0.005
$R^2$	0.228		0.214	
$\Delta R^2$	0.111 ***		0.150 ***	
Adj $R^2$	0.210		0.195	
Step 1				
degree of trauma	0.032	0.021	0.009	0.020
direct trauma	0.887 ***	0.172	-0.109	0.164
Step 2				
degree of trauma × direct trauma	<b>0.015 *</b>	0.007	-0.005	0.007
$R^2$	0.251		0.188	
$\Delta R^2$	0.123 ***		0.169 ***	
Adj $R^2$	0.233		0.169	
Step 1				
degree of trauma	0.083 ***	0.019	-0.012	0.017
resilience	-0.246 ***	0.025	0.290 ***	0.022
Step 2				
degree of trauma × resilience	-0.001	0.001	0.001	0.001
$R^2$	0.330		0.408	
$\Delta R^2$	0.061 ***		0.070 ***	
Adj $R^2$	0.314		0.394	
Step 1				
degree of trauma	0.041	0.021	-0.002	0.020
emotional work	0.173 ***	0.038	0.089 *	0.036
Step 2				
degree of trauma × emotional work	<b>0.004 *</b>	0.002	-0.002	0.002
$R^2$	0.235		0.199	
$\Delta R^2$	0.121 ***		0.170 ***	
Adj $R^2$	0.217		0.180	

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

The results of the simple slope analysis (**Figure 11**) showed that the higher degree of trauma had significantly higher burnout state scores than the lower degree of trauma in low boss support (mean-1SD) ( $p < 0.01$ ) and high boss support (mean+1SD) ( $p < 0.01$ ).

The results of the simple slope analysis (**Figure 12**) showed that the higher degree of trauma had significantly higher burnout state scores than the lower degree of trauma in low colleagues support (mean-1SD) ( $p < 0.01$ ) and high colleagues support (mean+1SD) ( $p < 0.01$ ).

The results of the simple slope analysis (**Figure 13**) showed that the higher degree of trauma had significantly higher burnout state scores than the lower degree of trauma in low specific support (mean-1SD) ( $p < 0.01$ ) and high specific support (mean+1SD) ( $p < 0.01$ ).

The results of the simple slope analysis (**Figure 14**) showed that the higher degree of trauma had significantly higher burnout state scores than the lower degree of trauma in low direct trauma (mean-1SD) ( $p < 0.01$ ) and high direct trauma (mean+1SD) ( $p < 0.01$ ).

The results of simple slope analysis (**Figure 15**) showed that the higher degree of trauma had significantly higher burnout state scores than lower degree of trauma in low emotional work (mean-1SD) ( $p < 0.01$ ) and high emotional work (mean+1SD) ( $p < 0.05$ ).

The results of simple slope analysis (**Figure 16**) showed that the higher degree of trauma had non significantly higher work engagement state scores than lower degree of trauma both in low specific support (mean-1SD) and high specific support (mean+1SD).

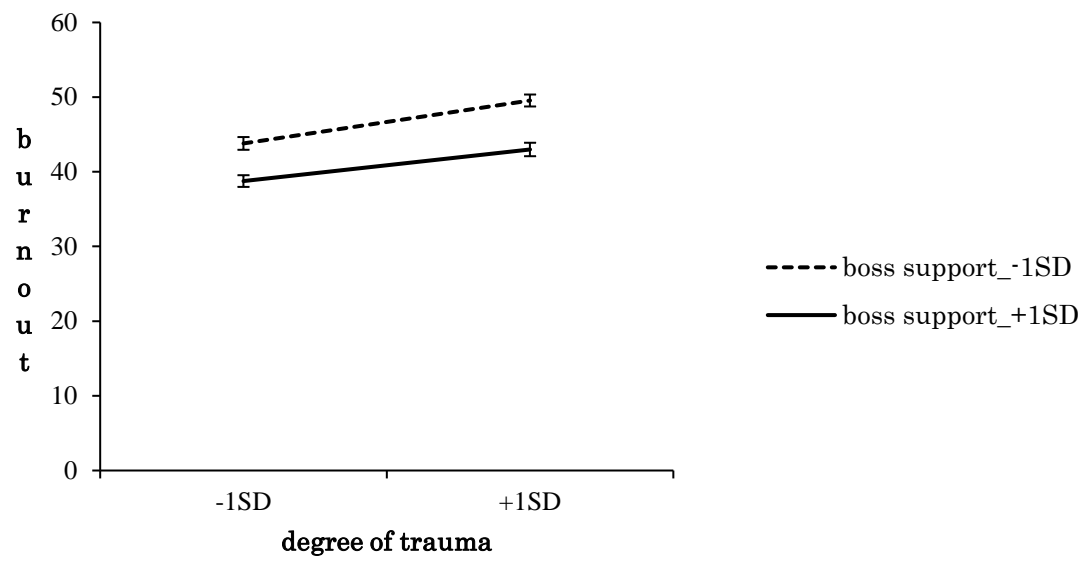


Figure 11. Interaction effect of degree of trauma and boss support on burnout.

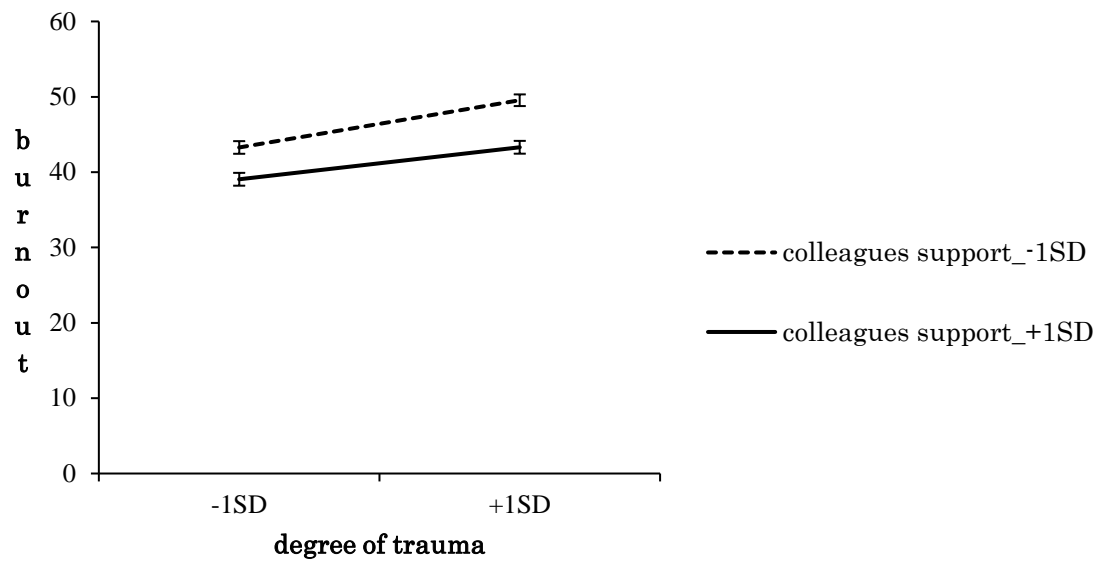
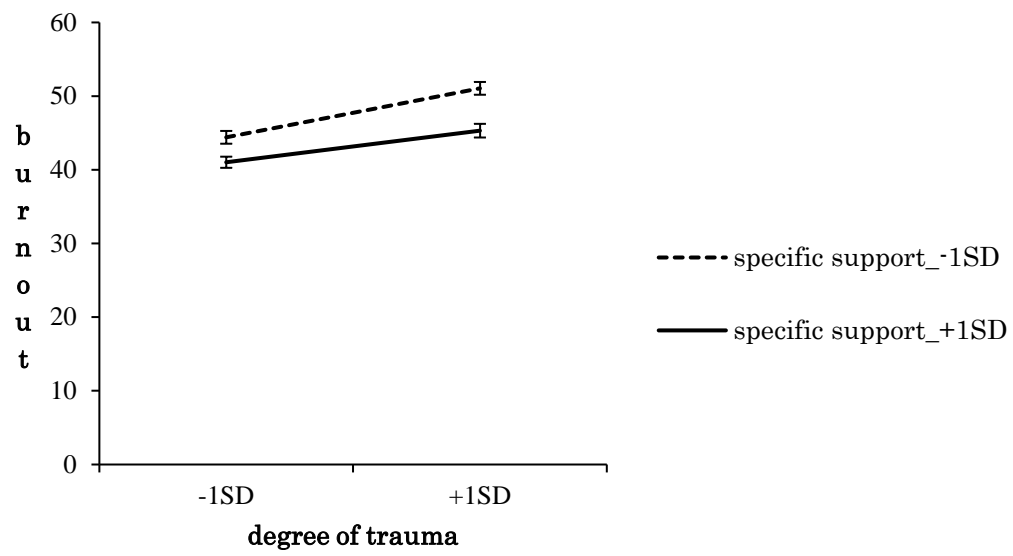


Figure 12. Interaction effect of degree of trauma and colleagues support on burnout.



*Figure 13. Interaction effect of degree of trauma and specific support on burnout.*

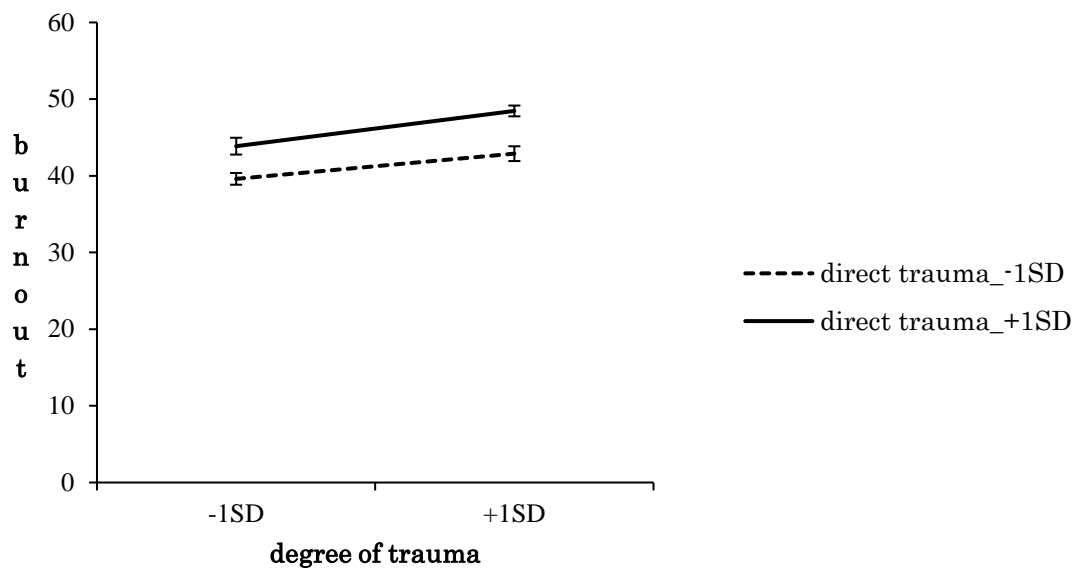


Figure 14. Interaction effect of degree of trauma and direct trauma on burnout.

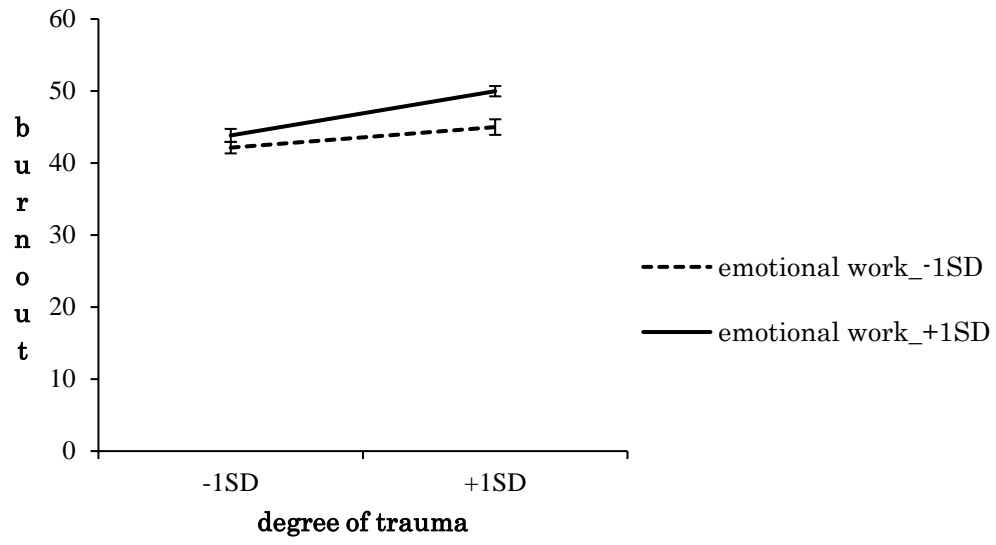


Figure 15. Interaction effect of degree of trauma and emotional work on burnout.



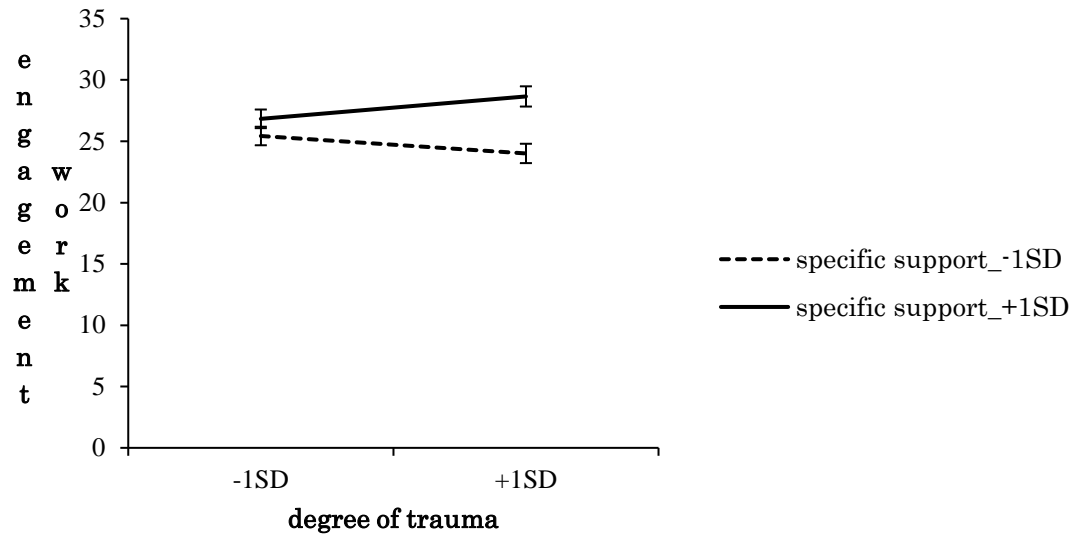


Figure 16. Interaction effect of degree of trauma and specific support on work engagement.

5. The relationship between “burnout and work engagement”, labor productivity and intention to stay

Pearson’s correlation coefficients were calculated for the relationships between “burnout and work engagement” and “labor productivity and intention to stay”. On the one hand there was a negative correlation between burnout and “labor productivity ( $r = -.42, p < 0.001$ ) and intention to stay ( $r = -.42, p < 0.001$ )”. On the other hand, there was a positive correlation between work engagement and “labor productivity ( $r = .38, p < 0.001$ ) and intention to stay ( $r = .33, p < 0.001$ )” (Table 12).

Table 12

*A correlation coefficient between burnout, work engagement, presenteeism, and intention to stay among midwives (N = 511)*

Variable	labor productivity	intention to stay
1 burnout	-0.42 ***	-0.42 ***
2 workengagement	0.38 ***	0.33 ***

\*\*\*  $p < 0.001$

Next, I conducted a hierarchical multiple regression analysis to investigate whether the status of burnout or work engagement could affect the relationship between intention to stay and labor productivity. First, burnout or work engagement was inputted in step one. Then, in step two, to control the influence of the attributes, five adjustment dummy variables were inputted; marital state, living with family, work place, position, and number of years of employment. Then, in step three, I inputted environmental factors: boss support, colleague's support, specific support, and direct cause of trauma. Finally, in step four, I inputted the individual factors of resilience and emotional labor.

1) The relationship between burnout and “labor productivity and intention to stay”

First, main effect of burnout in the relationship between burnout and labor productivity showed a significant negative correlation, and attributes, environmental factors, and individual factors were controlled ( $b = -.535, p < 0.001$ ).

Next, the main effect of burnout in the relationship between burnout and intention to stay showed a significant negative correlation; again attributes, environmental factors, and individual factors were controlled ( $b = -.043, p < 0.001$ ).

2) The relationships between work engagement and “labor productivity and intention to stay”

The main effect of work engagement in the relationship between work engagement and labor productivity showed a significant positive correlation, although attributes, environmental factors, and individual factors were controlled ( $b = .354, p < 0.001$ ).

Next, the main effect of work engagement in the relationship between work engagement and intention to stay was a significant positive correlation, although attributes, environmental factors, and individual factors were controlled ( $b = .033, p < 0.001$ ) (**Table 13**).

Table 13

*Hierarchical multiple regression analyses of burnout and work engagement with labor productivity and intention to stay among midwives (N = 511)*

	labor productivity		intention to stay	
	Step 4		Step 4	
	<i>b</i>	<i>b SE</i>	<i>b</i>	<i>b SE</i>
burnout	-0.535 ***	0.087	-0.043 ***	0.006
$R^2$	0.328		0.237	
$\Delta R^2$	0.039 ***		0.003	
Adj $R^2$	0.306		0.213	
work engagement	0.354 ***	0.097	0.033 ***	0.007
$R^2$	0.296		0.202	
$\Delta R^2$	0.050 ***		0.016 **	
Adj $R^2$	0.273		0.176	

\*\* $p < 0.01$ , \*\*\* $p < 0.001$

## **Chapter VII Discussion**

### **1. Background of respondents in this research**

The age of respondents in this study and the working place were compared with the percentage calculated by reference to actual employees of the number of working midwives by the hygiene administrative report example (medical workers concerned) (Ministry of Health, Labor and Welfare, 2016:2018). Distribution of age was almost the same, however in the age of over 50s, the estimates of population by age for Japan was 24.1%, but in this research it was slightly lower as 15.3%. For comparison, the ages 20s and 30s was 49.0% by the national statistics, but in this research it was slightly higher as 59.1%. Moreover, differences were found in the percentage of working place. In this study, 81.4% for hospitals, 6.6% for clinics and 10.3% for maternity homes were found, but the national average is 63.5% for hospitals, 21.3% for clinics and 3.9% for maternity homes. Respondents in this study were more midwives who worked in hospitals than the national average, fewer midwives in clinics, and many more midwives at the maternity homes.

### **2. The relationship between TSSM and “burnout and work engagement”**

#### **1) The relationship between TSSM and burnout**

TSSM (frequency, impact, and degree of trauma) and burnout had a significant relationship. Creedy, Sidebotham, Gamble, Pallant, and Fenwick (2017) conducted a burnout survey targeting 1,037 midwives. They found that 64.9% had burnout symptoms, and 43.8% experienced work - related burnout. Also, Cieslak et al. (2015) carried out a meta-analysis on job burnout and secondary traumatic stress that included 8,256 subjects from 41 published research reports. They reported that burnout and secondary traumatic stress were strongly related. In addition to the large number of female samples, this study considered that “secondary traumatic stress” meant, “we have traumatic symptoms as a result of being exposed to an indirect trauma experience”, which was very similar to the concept of this research. Based on the results of the previous study and the results of this study, it can be said that the possibility of causing burnout from a traumatic experience of midwives has been verified.

## 2) The relationship between TSSM and work engagement

TSSM (frequency, impact, and degree of trauma) and work engagement had a significant negative correlation. Halbesleben (2010b) meta-analysis revealed that that work-engagement and burnout showed a negative relationship. As the result, estimated mean correlation coefficient showed negative value. Since TSSM and burnout were positively related, it was predicted that work engagement, which is a pair concept of burnout showed a negative relation with TSSM, which was supported.

## 3. Interaction effect of environmental factors and individual factors in relationship between TSSM and “burnout and work engagement”

The variables that provided a significant buffering interactions in relation to frequency and degree of trauma, and burnout was specific support. Also, frequency, impact, and degree of trauma and emotional labor had a significant enhancing interaction. Although both were very small values, even if attributes were controlled, this variable showed a significant interaction effect in the relation that TSSM exerts on burnout. First of all, it is about specific support. This was a negative value, which is interpreted as a midwife experiencing a traumatic stress, it may cause burnout if they cannot receive the support as encouraged by the Japan Nursing Association (JNA). These concrete support methods directed to administrators are especially important when the stillbirth or sudden change occurred, suggesting the possibility of preventing burnout by properly receiving such support. Therefore, when stillbirth or sudden change happens, although attention tends to be directed towards the pregnant woman, it can also be said that midwife who was in charge of them also required adequate support. In other words, it does not mean that I cannot prevent burnout just because midwives received the assistance only once, which means that they always need enough to receive these specific supports so that burnout can be prevented.

Next, concerning the effect of emotional labor on the relationship between TSSM and burnout. The relationship between emotional labor and burnout has been pointed out in previous studies. For example, Edward, et al. (2017) conducted a systematic review of 20

papers related to emotional labor and burnout for psychiatric nurses. They reported that emotional labor was a factor that affects burnout. Contrary to the midwife's own feelings, the continuing efforts to show the expected emotions to patients such as pregnant and others who sufferer caused emotional dissonance and increased the psychological and physical stress response, so that burnout resulted.

Regarding the relationship between TSSM and work engagement, there was no significant interaction effect when controlling attributes. In other words, it was assumed that experience of the traumatic stress had a negative effect on work engagement. However, even if there were six variables such as boss support or colleague support, if controlled attributes, they these do not affect the outcome to work engagement. Although work engagement was directly related to TSSM, however, as for the variables there was no interaction effect affecting whether to turn to work engagement.

#### 4. The relationship between “burnout and work engagement” and “labor productivity and intention to work”

There was a negative correlation between burnout and labor productivity ( $r = -.42, p < 0.001$ ), and burnout and intention to stay ( $r = -.42, p < 0.001$ ). In this relationship, even if I control attributes, environmental factors, individual factors, the relationship was significantly correlated. Brborović, Daka, Dakaj, and Brborović (2017) investigated and comprehensively analyzed then systematized the elements associated with nursing sickness presenteeism (SP) and sickness absenteeism (SA) using cohort studies (12 SA and 1 SP). They reported there were significant relationship between SP and burnout, thus the ability to predict presenteeism and absenteeism in nursing is useful to constrain costs and ensure that quality care is delivered. Also, Jiang et al. (2017) investigated 976 nurses engaged in emergency wards in Shanghai, related to intention to leave, job satisfaction, and burnout. On the one hand they reported that burnout was associated with intention to leave. In other words, the higher the level of burnout, the lower the labor productivity and the lower the intentions to willingly work. On the other hand, in this study there was a positive correlation between work engagement and labor productivity ( $r = .38, p < 0.001$ ), and work engagement and intention to stay ( $r = .33, p < 0.001$ ). Similar to burnout, even



if the control attributes, environmental factors, individual factors, that was a significant correlation. Halbesleben (2010b) meta-analyzed some studies regarding work engagement. They reported that work engagement strengthened commitment to work, showed a positive correlation with positive outcomes at work, and included a strong negative correlation with intention to leave. These results correspond with the results of this research, and it was revealed that the higher the work engagement, the higher the labor productivity and the stronger the intention to stay.

A mental health countermeasure to burnout is an important part of disease prevention, and should lead to adoption of the countermeasures to prevent burnout. However, it does not lead to profit or direct merit from the hospital side. Of course, this research also found that midwives who experienced traumatic stress, especially midwives who experienced “Regret about my Midwifery Practice”, are more likely to experience burnout. Furthermore, it became clear that burnout caused a decline in labor productivity. In other words, even if a midwife experiences a traumatic stress, by providing specific support according to the Japanese Nursing Association recommended supports, it is possible to prevent burnout from happening, and as a result, this could also prevent a decline in labor productivity. However, Shimazu (2014) stated,

Instead of temporarily supporting only some out-of-control [sic] persons as a countermeasure therapy, I should capture [the] mental health of all employees including healthy people as important management resources, and I are also seeking a viewpoint to actively raise the health level of the workplace as a whole (p.11).

One of the remarkable results is that the higher the work engagement, the higher the labor productivity and the stronger the intention to stay. Although the traumatic stress has a negative correlation with work engagement, results indicated that even if six variables were controlled, it did not lean towards the increase in work engagement. However, support of boss and colleagues, and specific support and resilience were positively related to work engagement. Shimazu (2014) insisted that, “To raise work engagement, it will be possible by enriching “Job resources” showing support of boss and colleagues, discretion of job, etc., and “Personal resources” showing self-esteem at the organization, Optimism,

resilience, etc.” (pp.44-49). The same result was obtained in this research result. In other words, it is possible to prevent burnout by building an environment and structure that can support the boss or colleagues and the specific support. Furthermore, it is possible to expect an increase in work engagement, resulting in improvement of labor productivity. Therefore, it is important to enhance administrators’ awareness who are responsible for organization management. The environment in which support and specific support are easily obtainable leads to improve labor productivity and prevents intention to leave.

## 5. Limitation of this research

The following forth points are listed as limitations of this research.

First, when measuring traumatic stress of midwives, I think that it is meaningful to measure from the two aspects of frequency and impact. However, it is still necessary to investigate whether multiplying both sides is a valid representation of the extent of traumatic stress. Also, although the score width of the impact was set to 1 to 4, verification as to whether the width is appropriate is also necessary. In other words, for further research, an important task would be to improve the items and response selection to remove all ambiguity in the interpretation of the scale no matter who answers.

Second, I used the data from cross-sectional studies in this research; it is not possible to specify the causal relationship between factors. In the future, it is necessary to plan a longitudinal study and verify the causal relation.

Third, it is about the attributes of the subjects. Compared to the estimates of population by age for Japan it is considered that there is no big difference because the age of subjects were almost the same as the national average. However compared with the national average in the work place of midwives, there were many midwives who worked at hospitals, especially perinatal medical centers, and few midwives who worked at clinics. Therefore, the data of midwives who working at the perinatal medical center with many high-risk pregnancies is more reflected of that population. There is a high possibility that data from clinics with primarily low-risk pregnant women and manpower is short is not reflected. In addition the response rate was lower than the other groups. It is necessary to pay attention when adapting this research result to a midwife who is working at the clinic.

Lastly, although multiple regression analyzes revealed the association between midwives' traumatic experiences and burnout and work engagement, the influence was weak. In fact, the smallest value of the non-standardized coefficients for burnout was .017, and even the largest value was .256. Similarly, the smallest value of the non-standardized coefficients for work engagement was .002, and even the largest value was .061. In this research, we focused on the experiences of traumatic stress. It is quite possible that the type of stress experienced by midwives is not so much acute stress such as this traumatic stress, but chronic stress such as excessive work, interpersonal relationship, salary not suited to work, and low discretionary choices as to work. We have to identify the stress when measuring the burnout of the employed midwives and that chronic stress is involved in addition to this acute traumatic stress experience, therefore, as suggested by the low non-standardized coefficients. Work engagement is also a conceptual opposite of burnout, and as such may be a useful approach for research.

However, despite the limitations of the above-mentioned research, it is considered a significant result that there was low correlation between traumatic stress in midwives and "burnout and work engagement".

## **Chapter VIII Conclusion**

The psychometric properties of the Traumatic Stress Scale for Midwives Relationships were analyzed. The relationships between traumatic stress and burnout and work engagement were examined in 650 midwives working in hospitals, clinics and birth centers. The following results were obtained.

1. The average values (frequency, impact, degree of trauma) of the traumatic stress experience were the highest among the group in perinatal maternal and child medical center and unmarried.
2. Using a method of measuring the traumatic stress in midwives from both frequency and impact was a suitable way to capture phenomena experienced by midwifery practice.
3. TSSM was positive correlation with burnout and negative correlation with work engagement.
4. Boss support, colleagues and support, specific support showed significant buffering interactions in relation to “frequency and degree of trauma” and burnout. Conversely, direct trauma and emotional labor had a significant enhancing interaction in relation to “frequency and degree of trauma” and burnout.
5. Burnout had a negative correlation with labor productivity and intention to stay, whereas work engagement had a positive correlation with labor productivity and intention to stay.