



Evolving meaning from being pregnant and becoming a new mother over the period of a major earthquake: A grounded theory study

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ABSTRACT

This study aimed to investigate the experience of women who were pregnant and gave birth over the period of a major earthquake, and the roles and dynamics of family in relation to the health of these women. Constructivist grounded theory (GT) method was used for this study. Twenty-two women and two men were recruited through the beginning purposive and subsequent theoretical sampling strategies. The constant comparative analysis was guided by coding practice of the constructivist GT approach. The disturbance of life due to earthquake gradually relieved after the disaster, which was represented by the process of women's 'being disrupted', 'alleviating disturbances', and 'growing up'. 'Being there of the family members' is a mutual need between women and their families, which strengthened psychological recovering of the women. 'Instilling love and hope by the baby' is a buffer for alleviating stress and also a motivator for growing up of women. 'Changing values', which is developed under the comprehensive action of 'being disrupted', 'being there of the family members', and 'love and hope instilled by the baby', essentially reinforce the new worldviews and coping of the pregnant women. It is overall the 'evolving meaning' which represents the process of how these women recovered and attained their meaning of lives and stay healthy after the disaster.

1. Introduction

Studies in general have indicated that, earthquakes, as one of the largest among stressful events, have detrimental effects on the mental health of pregnant women [1–3]. The psychological responses related to earthquakes may lead to negative results for pregnant women and their babies, such as preterm birth and adverse development in their offspring [4,5]. The possible negative outcomes have attracted researchers' attention to study the psychological impacts of earthquake on this specific group of women, as well as the influencing factors, in order to explore effective support for them [6].

Accumulative studies indicated that family may play a key role, perhaps as mediators, in the recovery and maintenance of maternal psychological health after a major disaster [2,3,7]. It is necessary to better understand and explore how family members live and interact with these women during the period when they experience a major

earthquake. However, the existing studies mainly aimed to investigate the relationships between certain aspects (i.e. family resources and family relationship functioning) of the family and the mental health of perinatal women with a quantitative approach [6,8]. Although there were some qualitative studies that explored the family dynamics of perinatal women, the context of those studies was not a major disaster [9,10]. The grounded theory study, which provides useful information to understand the in-depth experience of pregnant women after a hurricane, also did not discuss in detail how family dynamics might affect them after the disaster [11]. Transferability of the results from this study for practice to perinatal women during the time of an earthquake is doubtful because of the differences in social context and cultural background of other geographical regions. There has been a paucity of studies focusing on the family interactions and processes of pregnant women after earthquake. Further research with the grounded theory (GT) that aims to discover the family dynamics and support of perinatal

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women during, and rearing a new baby after, a major earthquake as the social process is a methodologically suitable approach to explore such experience. Findings can provide implications for service improvement and interventions that better fit the specific needs of such a vulnerable population. In this connection, a GT study was conducted to explore the family interactions of childbearing and childrearing women over the time of a major earthquake.

2. Methods

The study began after the ethics clearance approval by The Hong Kong Polytechnic University's Research and Ethics committee (Ref. HSEAR20140714007).

2.1. Setting

This study was conducted from Sep 2014 to Nov 2015 in Ya'an, China, where a major earthquake (7.0 on the Richter scale) occurred on April 20, 2013. The affected area was 15,720 square kilometers and the economic loss was more than 84 billion RMB [12]. A survey conducted in Ya'an by the researchers indicated that the disaster psychologically impacted pregnant women with the depression prevalence as 35.2%, which was higher than that of the general population (7%–14%) who had not experienced an earthquake [13].

2.2. Participants and sampling

The researchers originally planned to recruit participants directly through health care department for children and community centers in the affected area in Ya'an. However, experience informed by the pilot study (conducted in April 2014) indicated that liaison person (mainly clinical workers in hospitals and community centers) were vital in establishing a connection between the researcher and participants for access in both settings. All participants were finally recruited and purposively sampled through liaison persons rather than the researcher herself, in the health care departments for children and community centers.

The potential participants (women) for this study met the inclusion criteria that they, 1) experienced the earthquake during the second or third trimester of pregnancy; 2) were over 18 years old; 3) gave birth to a baby thereafter; and 4) had no known history of hearing, speaking or cognitive problems. The targeted participants could also be the close family members of those women, e.g. their spouses. The data analysis through initial coding indicated that the women's parents and parents-in-law did not have many interactions with them though living together after the disaster. In view of this, the parents and in-laws were not theoretically sampled.

The first five women were purposively sampled according to the inclusion criteria. The ongoing recruitment of participants is theoretical sampling. Some examples of reflections on the process of theoretical sampling are outlined in Table 1. After 19 participants were theoretically sampled, the constant comparative analysis performed, theoretical saturation was observed for this study.

2.3. Data collection

This study collected data about the process from antenatal to around 1-year postnatal period of women who experienced the earthquake during their 2nd and 3rd trimester of pregnancy. According to a systematic review, the perinatal period was defined as pregnancy and the first year postpartum [14]. The relevant data were collected from the experiences over the perinatal process of perinatal women for analysis.

Semi-structured interviews with individual participants by the researcher (RJ) were conducted in participants' home for data collection. An interview guide (Table 2) containing a number of open-ended questions was prepared and revised according to the implications from

Table 1

Examples of my reflection on theoretical sampling.

Participants	Reflections
First five participants (A, B, C, D, E)	All of them indicated that accompaniment by family members, especially their husband, was the most important thing during the earthquake. Could I find some more participants whose family members were not accompanying them by their side to explore the needs of being accompanied? Then participant F, G, and H were recruited. The ex-husband of F was not accompanying her by her side during the first earthquake, but her current husband accompanied her during and after the second earthquake. The husbands of G and H were working in a distant place during the earthquake. I should explore their feelings with the absence of husbands and identify any other things that could counteract the possible negative feelings.
Participant F and G	Participant F experienced two earthquakes in 2008 and 2013. Over the two earthquakes, she experienced "being there by side" and "no sense of being there" of her ex-husband and in-laws. Participant G experienced the "being there by heart" because her husband did not return after the earthquake. Is "being there" the only need of women from their husband and family members? I may explore the presence and companionship of other family members and the attitudes around them.
Participant H	This participant obtained great support from her daughter. According to the interview with her, "being there by side" of other family members rather than her husband could also provide a significant sense of support. She appreciated her daughter very much for her companionship, and this changed her values of rearing children. Until now, all of them passively accepted the accompaniment of family members, are there any situations in which they actively wanted to be present to other people after the earthquake?
Participant J	Her husband was severely injured during the earthquake. She accompanied him actively. She implied that "being there" was also the pregnant women's supporting behaviour for her family members. I wanted to find some husbands to learn about their feelings of being-there by their wives. However, participant J's husband refused to be interviewed, because he was still recovering from his injury. So I tried to search for other husbands. Many husbands were unavailable because their workplaces were far away from their hometowns. Finally the two husbands (of F and S) were recruited because of their availability and representativeness of different backgrounds (including educational level, occupation, the status of accompanying during the earthquake).
Husbands of participant F and S	In order to explore the experience of "being there" as discovered from the experience of participant J, husbands of F & S were recruited. They were asked about their feelings towards their wives during and after the earthquake. Both husbands indicated that they appreciated their wives "being there" no matter by their side or at heart. And from the husbands' perspectives, being there is a mutual need, and this could help people alleviate their negative responses to a disastrous event.

a pilot study conducted in April 2014 to target the aims of the study. The interviews were digitally recorded with a small MP3 recording pen, which lasted from 35 to 69 min; with an average of 50 min. All interviews were transcribed verbatim. Field notes are complementary to highlight the circumstances and background of the interviews, and label critical points for ongoing reflection and data analysis.

A brief survey with the tool of Depression, Anxiety and Stress Scale-21 (DASS-21) at the time of the interview was also used to identify the women's psychological status. The tool has been proven to have good reliability and validity in assessing women [15,16] which could be used to triangulate the interview data [17,18].

Table 2
Semi-structure questions guide for interviews.

Participant	Semi-structured questions
Women who were pregnant during and gave birth after the earthquake	<ol style="list-style-type: none"> 1. Please talk about your physical status during the earthquake last year? What is the gestation week? 2. What were your feelings, thinking or experience of the earthquake from the time of earthquake until delivery of the baby? 3. What are the influences of earthquake on your daily life? 4. What are the things you need most from the earthquake until the baby birth? 5. Who were the ones that you expected most to give help or support to you? Why? What ways did you expect him/her to support you? 6. Who actually supported you from the earthquake until the baby birth? How is the relationship between you and the support person? What did they do to impress you? Give me some examples, please. 7. What are the impact or influences of their support on you at that time? Give me some examples for that, please. 8. If the interviewee talks about any physical discomfort during the earthquake, I can ask her to give examples of physical discomfort and what are feelings or experiences of the discomfort? 9. If the interviewee responds 'husband or family members' as an answer to question 6, I will ask her further if there were also other people, apart from family members, who supported her in terms of materials, emotions, psychological needs, work and/or social network. And what did those people do that impressed you? Please give some examples.
Family members of women	<ol style="list-style-type: none"> 1. What were you doing when the earthquake occurred? What was your feeling or experience about yourself? What was your feeling or experience about the pregnant women? 2. How was the relationship between you and the pregnant woman from the earthquake until baby-birth? How did you support her? Please give examples from material, emotional, and psychological perspectives. 3. How was the relationship between you and the pregnant woman from the baby-birth until now? How did you support her? Please give examples from material, emotional, and psychological perspectives. 4. From the earthquake until baby-birth, what kind of support did you obtain from the pregnant woman? How did you feel about that? From the baby-birth until now, what kind of support did you obtain from the pregnant woman? How did you feel about that? 5. Please specify how you interacted with the pregnant woman after the earthquake with examples, e.g. communication, support, or something else. 6. From the earthquake until baby-birth, what did you care or need most? From the baby-birth until now, what do you care about or need most?

2.4. Data analysis

The data were collected and transcribed in Chinese (being the same language, with original best meaning intact) in the first place for analysis, and translated to English by all researchers who are bilingually fluent in Chinese and English for reporting and discussion after the data analysis when the core category and process developed, based on the analysis of the Chinese transcripts.

The two researchers (RJ and CCLV) separately practiced the coding process as described by Charmaz GT with measures to assure the rigor of this study [19]. Memos, notes, and reflections were written, recorded, and applied in developing the core categories and discovering the resultant process. The two researchers met regularly to compare and discuss about the codes they made and selected the ones that made the most analytic sense. Examples of the initial codes and focused codes are provided in Table 3. A total of 2000 initial codes developed over the entire constant comparative process of analysis were reduced by researchers with theoretical sampling and ongoing analyses of more specific foci to 746 initial codes, and then 23 focused codes, before theoretical saturation. Eventually, seven more focused codes emerged. The computer software NVivo 10 was used to enhance data management, aid data analysis, and maintain a clear audit trail.

2.5. Rigor of the study

In this study, competent interview skills; triangulation of data; member checking; peer debriefing/examination; and the use of negative case analysis were applied to improve the credibility. The audit trail of the executive and analytical process and the code-recode procedure were the techniques to ensure research dependability. The audit trail could also help the researchers to consider the logics of the data, and warrant the confirmability of the study. Examining demographic characteristics of the participants, considering the data more than the participants and member checking can help in determining transferability.

3. Results

Twenty-two women and two husbands in total were recruited. Demographics of the women and husbands is detailed in Table 4. Two women (participant F and S) were re-interviewed that they had shared in-depth understanding about their lives during the first interviews, and their backgrounds represented two different situations surrounding the tentative categories for theoretical sampling. Participant F had different experience of family support from the 2008 and the 2013 earthquakes, which served as comparing cases for the developing categories 'being there at her side' and 'no sense of being there'. On the other hand, participant S had a good marital relationship even if her husband was not staying with her during and after the earthquake. This served the other comparison case for the developing category 'being there at heart'. The two husbands were interviewed for theoretical sampling.

A core process emerged as 'evolving meaning' (Fig. 1) illustrates how these women recover and realize the own meaning of their lives, from the time of being disrupted by the disaster (phase 1), through an overall 'alleviating' stage of fluctuating psychological responses (phase 2), to the period of 'growing up' with adaptation to new ways of living and the meaning of survival (phase 3) after being pregnant and giving birth over the period of an earthquake. During the phase of 'being disrupted', the earthquake interrupted women's lives and reduced their support, and these women responded in a psychologically negative way, both to the disaster and within themselves. The phase 'alleviating disturbance' is a transition period of alleviating negative psychological response and disturbances in the lives of these women. They were gradually restoring normalcy to their daily lives with external support (e.g. being there of the family members), and the love and hope instilled by their babies. Although, in this phase, the women presented fluctuating psychological responses and even returned to the first stage because of aftershock and childbirth, there was still an overall trend of alleviating towards the final stage of 'growing up'. In the final phase, the women returned to the normal lives they had lived before the earthquake stuck; and obtained new meaning in their lives. Representative quotes from the participants by each category are provided in Table 5. In addition, Glaser and Strauss [17] hold that literature can also be used as data with the analysis. Some relevant literatures as data were used with the constant comparative analysis in generating the results.

Table 3

Examples of coding from initial to focus ones.

Highest level of focused codes	Third level of focused codes	Second level of focused codes	First level of focused codes	Initial codes	
Being disrupted	Affecting health	Affecting physical health	Abnormal fetal movement	Increased fetal movement Decreased fetal movement Uterus contraction	
		Affecting psychological health	Being nervous Being fearful	Nervous to shaking Being fearful of the frightening scenes Being fearful of the injury or death of family members	
		Disturbing medical services	Irritating Worrying	Losing control of emotions Worrying about house collapsing Rushing and confusing medical staff	
	Disturbing daily lives			Changing birth plan Inconvenient transportation Going out to play after the recovery from fear	
	Reducing leisure activities Poor food supply and appetite Poor living conditions			Poor clothing Poor appetite Poor food supply Destructing houses	
		Dislodgement in fear of death Poor living environment of postpartum period			
		Reducing family support		Reducing emotional support	Reducing instrumental support
			Reducing high-quality food supply		
	Valuing the baby as usual (a code that was excluded finally)				Feeling regret with diet control during pregnancy Viewing work as one way that was beneficial for natural delivery

3.1. Phase 1-being disrupted by the earthquake

From this study, 'being disrupted' was characterized by the 'disturbance in their daily lives', 'experiencing negative psychological responses', a sense of 'being insufficient and unconfident', and 'increasing family cohesion and interpersonal relationship as a result of the earthquake', and 'developing a positive attitude towards life out of the earthquake'. Almost every aspect of life was affected. Besides, the pregnancy symptoms and birth plan were also affected.

Under such a circumstance, the most commonly used words by the women to describe their experiences during and immediately after the disaster could be classified as 'negative'. Their negative responses were found to be in four types: fear, anxiety, nervousness, and irritability. For instance, participant T used the American TV series "The Walking Dead" to describe the frightening scene that she saw after the earthquake.

Apart from the negative psychological responses, the women were discouraged, and lacked confidence in themselves during the earthquake and pregnancy. They began to doubt their ability, or even to lose their confidence in their ability, to protect and help themselves, family members, unborn child, and others in society. Participant D indicated that she moved to live with her mother-in-law because many people around could help to protect herself and baby.

Although the overall impact of the earthquake on the women appeared to be negative, it paradoxically brought with it a number of unimaginable positive effect. This included an increase in family cohesion and stronger interpersonal relationships for the women, which could somewhat explain their change to having more positive attitudes after the earthquake. The women attributed these positive effects to more gathering time (the duration that people stay together) and greater mutual understanding between family members, brought about as a result of the earthquake and subsequent social support. The experience of participant D represents a typical example for the positive effect of the earthquake in relationship to the trigger of family cohesion.

I felt that the relationship between my mother-in-law and me, or between other family members and me, had become better after the earthquake. All of us lived separately before the earthquake, but living together after the

earthquake, the relationship between us became better. (Participant D, line 367–369).

In view of this, the earthquake not only brought negative consequences, but it had positive effects as well, by increasing family cohesion and the strength of interpersonal relationships. The contradictory outcomes of the disaster also brought about psychological responses in these women, whose thoughts were dominated by negative responses in the beginning, yet were interspersed with a more positive attitude and outlook towards their lives after the earthquake ('changing values'). When asked to remark on the earthquake, participant S admitted that the disaster triggered her growth and her becoming tougher than before, which was considered to be the development of a positive attitude about life.

3.2. Phase 2-alleviating disturbances

'Alleviating disturbances' referred to allaying the women's negative, although not always (fluctuating emotions) and psychological responses, and gradually restoring their daily lives. Two major sub-categories (e.g. family members' being there, love and hope instilled by the baby) were intertwined throughout the entire process, which enhances women's confidence and courage to fight against the disturbances of the disaster, and engaging them in a process of 'growing up' as mothers by changing their values.

During this phase, the women were alleviating their negative psychological responses, and gradually restored their usual daily routine. Participant V described the life after the earthquake as a very slow, but an advancing alleviating process in the dynamic. Her negative psychological responses were relived when she spoke about her feelings with family members, and learned that her baby was well.

Nevertheless, the earthquake's aftershocks did not stop for a long time, which constituted a potential threat, and made the women restless and fluctuate in terms of negative psychological responses. The baby-birth could also increase their stress about protecting the baby, which in turn made them more anxious or frightened. Furthermore, the changes in the endocrine system after childbirth increased their risk of

Table 4
Study demographics of the women and the two husbands included.

	Age	Occupation	Education	Family income (RMB/year)	Child	DASS-21 scores
A	39	Farmer	Junior school	10,000–19,999	1st: boy 2nd: boy	D 11 mild A12 moderate S 16 mild
B	25	Accountant	Bachelor	≥50,000	1st: girl	D 3 normal A10 moderate S 10 normal
C	24	Clerical officer	Bachelor	≥50,000	1st: girl	D 1 normal A 3 normal S 3 normal
D	24	Nurse	Junior college	5000–9999	1st: girl	D 4 normal A 13 moderate S 9 normal
E	24	Nurse	Junior college	20,000–49999	1st: boy	D 2 normal A 3 normal S 8 normal
F	31	Farmer	High high school	≥50,000	1st: girl (ex-husband) 2nd: boy	D 3 normal A 3 normal S 6 normal
G	27	Home duties	Junior college	≥50,000	1st: girl	D 1 normal A 3 normal S 1 normal
H	26	Home duties	Junior school	20,000–49999	1st: girl 2nd: girl	D 1 normal A 6 normal S 10 normal
I	34	Farmer	High school	5000–9999	1st: girl 2nd: boy	D 0 normal A 4 normal S 5 normal
J	26	Nurse	Junior college	10,000–19999	1st: girl	D 1 normal A 1 normal S 0 normal
K	23	Factory worker	High school	<5000	1st: girl	D 7 normal A 10 moderate S 14 normal
L	23	Home duties	High school	≥50,000	1st: dead 2nd: boy	D 0 normal A 4 normal S 9 normal
M	24	Home duties	High school	10,000–19999	1st: girl	D 7 normal A 11 moderate S 17 mild
N	28	Home duties	Junior school	≥50,000	1st: girl 2nd: girl	D 2 normal A 1 normal S 2 normal
O	27	Home duties	Junior school	<5000	1st: girl (ex-husband) 2nd: girl	D 8 normal A 6 normal S 10 normal
P	27	Nurse	Bachelor	≥50,000	1st: girl	D 1 normal A 5 normal S 8 normal
Q	27	Nurse	Bachelor	≥50,000	1st: girl	D 3 normal A 8 mild S 10 normal
R	28	Midwifery	Bachelor	≥50,000	1st: girl	D 3 normal A 0 normal S 5 normal
S	31	Nurse	Bachelor	≥50,000	1st: girl	D 2 normal A 0 normal S 0 normal
T	32	Teacher	Bachelor	<5000	1st: girl	D 5 normal A 8 mild S 6 normal
U	29	Accountant	Junior college	≥50,000	1st: girl	D 0 normal A 0 normal S 1 normal
V	27	Clerical officer	Junior college	5000–9999	1st: boy	D 6 normal A 8 mild S 13 normal
^a F	39	Farmer	High school	He is the second husband for F; Stayed with her during and after the earthquake		
^a S	31	Policeman	Junior college	Lived with S, but could not accompany her all the time because of work		

For the DASS-21 scores, D represent “depression”, A represent “anxiety”, S represent “stress”. The scores and levels were list after the letter “D”, “A”, and “S”

^a Husband of the participants.

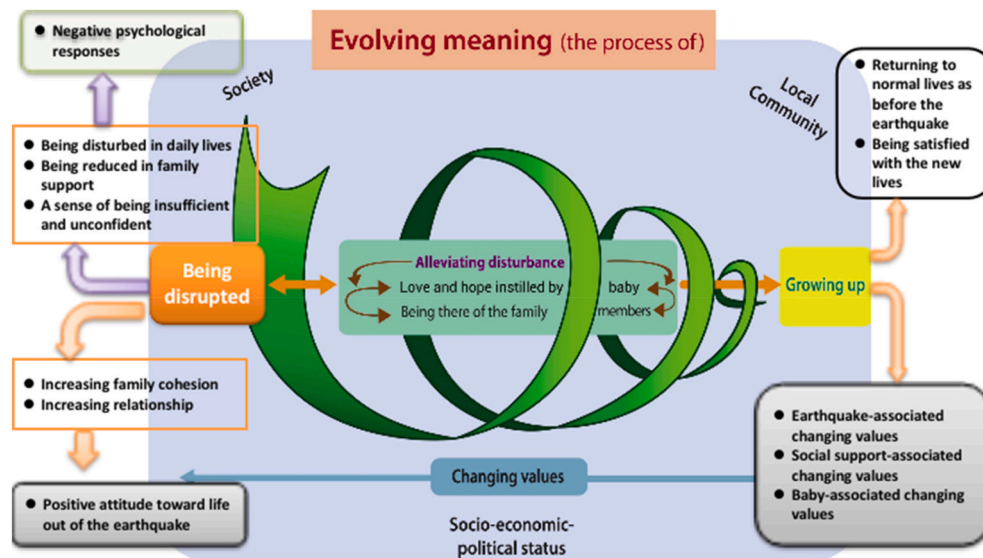


Fig. 1. The process of 'Evolving meaning'.

distress. These factors might at times worsen their negative psychological responses. Although overall the responses were alleviating with the support available from their surroundings, their psychological status could fluctuate during the time of alleviating negative psychological responses, and they might return to the first stage of 'being disrupted'. Participant L stated her aggravated anxiety because of the aftershocks and her worries about her newborn baby. Apart from external causes, the changes in the endocrine system after delivery also posed a risk of disturbance for these women [20]. Participant V experienced unstable moods after childbirth and attributed it to postpartum distress or depression.

The situation of 'fluctuating in psychological status' in terms of the 'negative psychological responses' continued until daily life was restored. With relief from negative psychological responses, the women were not passively waiting for the restoration of their lives, but rather participated in various recuperating activities. Participant M said that she prepared food at about seven months gestation, to support her family members who were rebuilding their house. Participant F commented that she supported her elderly parents with spiritual encouragement. She said that "I could not help them for any instrumental or operational aspects. But what I could do was talking with them and supporting them emotionally" (Participant F, line 518).

During the dynamic, 'alleviating disturbances' as phase 2, two sub-categories, 'being there of the family members' and 'love and hope instilled by the baby', were found to be crucial and interwoven with the three conditions ('alleviating negative psychological responses', 'fluctuating psychological status', and 'gradually restoring daily life') for the advancement of such a dynamic. The relationship of five components in the dynamic of alleviating disturbances is shown in Fig. 2. The relationship between 'alleviating negative psychological responses' and 'restoring daily life' was bidirectional and they could stimulate each other. However, the aftershock and childbirth during this phase may cause those women to present fluctuating psychological status and handicapped them from restoring normal psychological status and daily lives. Nevertheless, with the function of 'being there of the family members' and 'love and hope instilled by the baby', the process was still progressed to the phase 'growing up'.

'Being there of the family members' was a crucial force that progressed the alleviation of psychological disturbances. According to psychologists, 'being there' means being committed and ready to respond to the emergencies of life [21]. Similar to the present study, no matter in the form of 'at the side' or 'at heart', the family members were

committed to the women and were ready to respond to their needs through various ways. There were three types of 'being there of the family members' according to the experiences of women in this study: being there at side; being there at heart; and no sense of being there. 'Being there at side' refers to a situation where family members actively stay with the woman, and the family members feel they are present to each other in person and with their heart. Participant F clarified the meaning of 'being there' as "facing disaster together and not giving up" (Participant F, line 249). This kind of 'being there' had more positive effects on the women than the other two types, because family members may fulfill multiple roles, including as caretakers, listeners, and lovers, and provide support through their actions at the woman's side. The functions of 'being there at her side' included 'strengthening emotional attachment', 'obtaining daily care', 'reassuring' (e.g. a sense of safety), 'beneficial to the baby's growth', 'venting negative emotions', and 'gaining courage in facing danger'. For instance, participant F described 'being there of her husband' as a reassurance for her to calm down.

This time I was not too frightened because his father (husband) accompanied me all the time. He encouraged me and asked me not to fear, and not to be anxious. So I did not fear and was not anxious at all. (Participant F, line 61–63).

'Being there at heart' means that family members could not stand by a woman for certain reason/s, but the woman could also feel that their hearts were with her, on the basis of their regard and concern. It seemed that they stayed together at heart. Its function in satisfying the women's needs was weaker than "being there at her side". A number of behaviors could make the woman gain a sense of 'being there at heart', which included 'asking trusted others to be with her', 'increasing communication through technology' (e.g. by phone or network video), 'choosing a closer workplace', and 'working hard for the family'. For example, the assistance that participant S received from others she and her husband trusted also met some of her daily needs, and was a partial comfort to her. 'Being there at heart' shared the functions of 'strengthening emotional attachment' and 'reassuring' with 'being there at her side'. In addition, modern communication technologies (e.g. talking on the phone) could also help the women to 'obtain courage' from the encouraging words of family members and 'vent negative emotions'. However, their effectiveness and usefulness might be lessened by distance, as well as by the inability to see and touch one another. Nevertheless, 'being there at heart' could still alleviate the negative psychological responses of these women.

'No sense of being there' means that the perinatal women had no

Table 5
Representative quotes by each category.

Categories	Subcategories	Representing quotes
Being disrupted	Disturbances in daily life	<p><i>We lived in the tent until I delivered the baby, because there was no way for us to repair our house if we did not break it down first – we could not do so at the time I was pregnant and after the earthquake.</i> (Participant J, line 308–309)</p> <p><i>Regarding the material resources needed, we could not go back home for dinner because of the earthquake. We had to eat in restaurants, or buy something instant to eat from supermarkets. I really did not want to eat fast food, such as breads and mineral water. I just wanted to have a good dinner at home.</i> (Participant D, line 272–274)</p> <p><i>I found that the fetal movement was not as normal as usual. It seemed that she might have a bit of hypoxia ... But look, doctors were flustered at the time of the earthquake, and they could not care for me</i> (Participant B, line 15–17).</p> <p><i>I wondered what to do if I would deliver my baby right after the earthquake. According to the fortuneteller, we had originally planned to have a C-section on a particular date (one day after the earthquake) because my parents were a little superstitious. They thought that for a C-section, a lucky date to deliver the baby could be chosen. And such a date for the delivery must be fixed. Finally, the earthquake occurred before we arrived at a consensus about the date for the C-section.</i> (Participant B, line 29–33)</p> <p><i>I can tell you that whenever I went to the house, I thought of finding something to cover myself, and the earthquake would not kill me with falling objects, haha. I also thought about whether I should put myself into the closet once an earthquake had occurred. I thought a lot.</i> (Participant T, line 435–437)</p> <p><i>I felt nervous all day (after the earthquake). If there were any vibrations, I would think it was an earthquake.</i> (Participant D, line 353–354)</p> <p><i>I moved to live with my mother-in-law. If there were many people around me, I would feel better. I told my husband that I was scared when he went to work and that I stayed at home alone.</i> (Participant D, line 82–90)</p> <p><i>Because I was pregnant, I didn't dare to do so. I was afraid that bad things would happen to my baby and myself, so I didn't dare to do so.</i> (Participant T, line 533–534)</p> <p>Researcher: Another question is what were the impacts of the</p>
Being disrupted	Experiencing negative psychological responses	
Being disrupted	A sense of being insufficient and unconfident	
Being disrupted	Increasing family cohesion and interpersonal	

Table 5 (continued)

Categories	Subcategories	Representing quotes
	relationship as a result of the earthquake	<p><i>earthquake on your family?</i> (Before this question, the participant talked about the impact of earthquake on herself and her family members)</p> <p><i>Anyway after the earthquake, our family cohesion increased. What to say about that? It means that we could experience more family love and affection. Thus the relationship between us had become better.</i> (Participant D, line 369–370)</p> <p><i>Interpersonal relationships? The situation was similar to family relationships. You know that friends would contact each other when the earthquake occurred, and they paid more attention to you. The relationship between colleagues was closer, which was a relatively intimate one. They seemed like my relatives, because they did not want to lose you. So I felt that our relationship was becoming closer. This is real, and particularly obvious in my department.</i> (Participant Q, line 327–331)</p>
Being disrupted	Developing a positive attitude towards life out of the earthquake	<p>Researcher: <i>What do you think of the earthquake?</i> (Before this question, the participant showed her positive attitude toward the disaster and I want her to make comment on it)</p> <p><i>Uh, there are good and bad things about it. The bad are the damages brought by the disaster, which were greater than the good. Of course we cannot really say it is good; the earthquake could not bring good things to us. But on the other hand, it made us recognize that we should cherish our lives. I do not mean that the earthquake brought any good to us; there was no good for us, only influences..... Anyway, I felt that I became tough with my experiences building up over the period of the earthquake. I think that people can increase their abilities to cope better with adversities in life. Nothing was special then. My experiences of every little thing after the earthquake made me tougher.</i> (Participant S, line 287–292; line 426–429)</p> <p><i>But I feel that those feelings are receding if I avoid thinking about them. Particularly the first day of the earthquake made me feel petrified. Then I gradually felt relieved. Later, I even felt that my experience of the earthquake was funny and I might burst out laughing when I talked about it with my family members. I said to them that I could not even see them because of being close to death After that, I merely worried about whether my anxiety would affect the health of my baby. I felt relaxed when</i></p>
Alleviating disturbances	Alleviating negative psychological responses	

(continued on next page)

Table 5 (continued)

Categories	Subcategories	Representing quotes
Alleviating disturbances	Fluctuating psychological status	<p><i>the health check on my baby indicated that all was well. (Participant V, line 208–216)</i></p> <p><i>They said that our house had cracks and would collapse with more earthquakes. So we were more anxious. Then one more earthquake (actually an aftershock) occurred, my mom grasped my baby. She was prepared to shout from downstairs and urged us to escape. All of us were anxious. Since we focused all our efforts and concerns on the baby, were fearful of a re-occurrence of the earthquake. (Participant L, line 185–189)</i></p> <p><i>I cried more easily regarding my feelings after the childbirth. It might be attributed to “postpartum depression” as they said. I would cry on the bed without any specific reason, so the tears wet my pillow during the postpartum period. (Participant V, line 177–180)</i></p> <p><i>I could not escape, because I was pregnant. His father stayed with us. He was just staying with me, reassuring me, “nothing to worry about, the house would not collapse because we build it recently”. Oh, he told me that theoretically, that strengthened my mind. Then I felt I didn’t fear as much Everyone can mutually understand each other. When faced with such a disaster, everyone should treat it seriously and stay positive psychologically. ... What is the meaning of companionship? It means the two persons should not give up on each other. Yes, it is not giving up on each other. The two should correctly face the difficulty together. Whatever difficulties are faced, the two should face them together in any case. (Participant F, line 29–30; line 249–250; line 256–258)</i></p> <p><i>I remember that we two went out and there was still an aftershock that day. Then she (daughter) saw that I was wearing a skirt. She went upstairs to get me my coats, regardless of the aftershock. ... Then she spoke words to encourage and console me. She said that she was not scared, and I should also not be fearful. Then she said that she would protect us. She told me that. ... I was moved and I thought I did little to care about her. She was so sensible that what I did for her was not enough. This is my feeling. (Participant H, line 169–180)</i></p> <p><i>Researcher: Do you mean that you didn’t need his companionship?</i></p> <p><i>I also hoped, more hoped so. I hoped more that he could</i></p>
Being there of the family members	Being there at side	

Table 5 (continued)

Categories	Subcategories	Representing quotes
		<p><i>accompany me at my side. Of course emotional accompaniment was also necessary.</i></p> <p><i>Researcher: What does emotional accompaniment look like?</i></p> <p><i>Psychologically, you must be sure that he was always considering you first. So at that moment, he could say something or else through telephone or video communication, which could make you feel that he was concerned about you, and you were not alone over there. However, he did not achieve that. He did not return immediately. I just hoped that someone could be with me at my side, but all were friends. (Second interview of participant S; Line 53–61)</i></p> <p><i>Actually, I appreciated my husband, although he could not take care of me himself. He couldn’t help it. At that time, I was hoping that he could come back to stay with me, which would have made me feel safer. However, he did not return. Ah, I could not require too much because of his work demands. However, his friends took his place in taking care of me, although my wish was for the support of my family and family members. (Participant S; line 42–45)</i></p>
Being there of the family members	No sense of being there	<p><i>Whenever I thought of that earthquake, I felt very sad. Because they did not even come upstairs to save the baby who was so small. I may not have felt so helpless if they had come to save the baby. Can you understand? I may not have felt helpless even if I had been injured by the earthquake. What I thought of, was the baby. Imagine that they, as adults, could not even come upstairs to save her. I felt very sad whenever I thought of this event (burst into tears). ... I felt that and sorry for my baby, it was so ... (no words here). I did not care about my own safety, but it did matter to my baby. So many people were standing downstairs, but nobody came upstairs to save my baby and me. (Participant S, line 360–364)</i></p>
Love and hope	instilled by the baby	<p><i>He felt better four days after he was injured. However, he still felt great pain, which he could not tolerate He would touch my belly everyday and said something to the baby as so. Although his consciousness was not very clear at that time, he still remembered to remind me about having a good rest. (Participant J, line 214–215; line 219–220)</i></p> <p><i>There is a change in my teaching style. I pay more attention to</i></p>

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Table 5 (continued)

Categories	Subcategories	Representing quotes
Growing up	Returning to normal life	<i>weak students because they need my attention more now. ... The weak students are lagging emotionally; they need more attention and love from the teacher.</i> (Participant T, line 604–608)
		<i>I felt happy when I was pregnant, because of my baby. Nothing worried me if I thought of my baby; and because of the care I had received from other family members.</i> (Participant E, line 422–423)
		<i>At that moment, I told myself, ouch (sighed), I should not be panicking or anything else, and I should treat it calmly and avoid anxietyEspecially at the time of my pregnancy, I should not run in a hurry, should I? I could not run when carrying a baby.</i> (Participant F, line 27–28)
Growing up	Being satisfied with the new life	<i>I could feel that the whole family was concerned most about my belly. I felt that the whole family resolved around me, which gave me a taste of happiness.</i> (Participant E, line 448–449)
		<i>I felt much better now. I totally walked out of the shadow of the earthquake. Since the time the baby was one month old, I gradually felt better. I become better, particularly after returning to my work.</i> (Participant D, line 312–313)
Growing up	Changing values	<i>I am satisfied with my current life. Not experiencing any disasters, going to and returning from work every day, and living my days well, is already the best for me.</i> (Participant S, line 284–285)
		<i>The major problem now is the shortage of money. Nothing else troubles us. But it is good that we could borrow money if we wanted. So if we go to work and work hard, we can earn money and make our lives better.</i> (Participant A, line 681–683)
		<i>Since we experienced the important juncture of life and death, the family relationship has become more important. I think this is my greatest feeling. Whenever I quarrel with my husband now, my father-in-law would ask us to stop for the sake of the family relationship. After all, my husband commits his life to care for us.</i> (Participant U, line 108–111)
		<i>I felt that was it really difficult for them to be here. They gathered after the earthquake, talking to us, discussing things with us, and were concerned about us. They showed their unselfish love and care. So I want to return my concerns more to them You can see that those volunteers cared about us unselfishly. So I should be more concerned about my students</i>

Table 5 (continued)

Categories	Subcategories	Representing quotes
		<i>unselfishly, and help them succeed.</i> (Participant T, line 353–355, line 621–623)
		<i>I would not discipline her in the past, but it has changed now. I felt that I missed a lot of something important (in her rearing) in the past. But I finally find the truth of it after I care about them now. ... I do not leave them (babies). I may even take them together to work in other cities. ... In the past, I thought I needed to do nothing but just earn money and send back money for them</i> (Participant H, line 199–200, line 206–207, line 210)
		<i>So I felt that it (bearing and rearing a baby over an earthquake) was a trigger for the growth of my life. How to say it, it means that you should handle any events calmly. If you cannot live with it calmly and have a clearer mind, it is still troublesome and vexing. The key is to keep calm and avoid hurrying. This is what I summarized now from the experience of bearing a baby over the earthquake.</i> (Participant F, line 76–78)
		<i>Researcher: Since the earthquake, what do you think were changed most?</i>
		<i>No special impression about this but becoming more mature.</i>
		<i>Researcher: What do you mean mature?</i>
		<i>I just felt that lives were experiencing and experiencing more. Then you should adjust yourself to cope with them with a good psychological quality, which could prevent you from being affected by any events.</i>
		<i>Anyway, I thought that I became tougher with the accumulation of experiences over time. Then there was nothing special.</i>
		<i>Experiencing those things could make me deal with and sustain those and more events.</i> (Participant S, line 422–429)

sense of being there from family members, no matter whether they stayed at her side or not. It could specifically refer to the status of neither being there in person, nor in heart. The women might feel specially helpless and sad when she thought that her family members were standing there (even) but did nothing for them. Participant F is a woman who experienced two major earthquakes (2008 earthquake and 2013 earthquake). During the first earthquake, her first baby was two months old. Unfortunately, her husband at the time and his family members stood downstairs and did nothing. This distressed her greatly, and she was the only one among all participants, who cried because of poor family support during the interview. She divorced her then-husband after the first earthquake, which could partly be attributed to her disappointment. Fortunately, she subsequently re-married with a good partner, before the second earthquake, and her current husband accompanied her all the time during that earthquake. The comparison of her experience in the two earthquakes could serve as a typical example

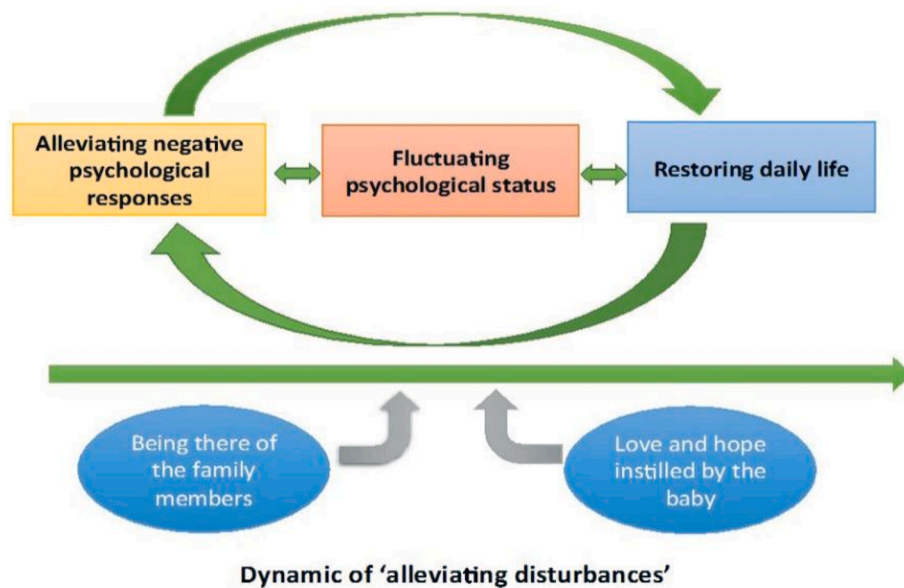


Fig. 2. The relationship of five components in the dynamic of 'alleviating disturbances'.

of 'being there at side' and 'no sense of being there', which led to the woman showing negative emotions.

'Love and hope instilled by the baby' was another source of power in phase 2 that interwove with the three conditions of 'alleviating disturbances' in helping women. Baby could inject new meanings of love, hope, and courage into the mothers, in the form of both an unborn child and an infant after birth. It seemed to be a major power source that stimulated the women to pursue self-improvement in order to create a good environment for the baby. With the love instilled by the baby and family members, these women learned how to love others and became a person filled with love. Participant T began to think about love, and to learn to love after her experience of the earthquake and childbirth. This participant particularly noted that she obtained extra help from volunteers because of her baby during pregnancy. Through the experience of having a baby after a major earthquake, she began to think about the essence of love. The baby also meant hope for the women and could stimulate the couples to take action, rather than remain passive during the difficult time. The researcher asked the husband of F that "*what was most important thing for you and your wife at that time* (during the earthquake)". He said that the baby was the biggest hope for him and his family, describing it as "*the sustenance of life*" (means extending the meaning of their own lives and carrying on the family lineage).

The existence of the baby could motivate the perinatal women to actively adopt coping strategies for the benefit of babies and thus constituted the motivator for coping and growth of the women. Through the experiences of earthquake and childbirth, the perinatal women coped with the 'disturbances of the earthquake' and learned to devote themselves to the baby. In contrast with other perinatal women, they would do more, because there were greater threats to the baby from the disaster, and they would do more to protect it. They adopted a series of coping strategies, which included 'adjusting negative moods', 'ensuring safety', and 'earning more money'. For instance, participant F realized that panicking and rushing to escape would probably cause injury to herself, as well as indirectly to the baby. She must keep calm to prevent herself from falling, thus protecting the baby. In addition, the baby could alleviate the women's negative psychological status by 'decreasing anxiety with the evidence of baby's well-being' and 'increasing the mother's confidence to protect'; and indirectly by 'sharing responsibility and workload in caring for baby with family members', 'improving family cohesion', and 'being privileged in others' treatment for the baby'. Although the literature did not directly indicate the positive

functions of childbirth in alleviating negative psychological responses, this study discovered such a process. A number of studies found that the childbirth could bring greater intimacy to family members, which could subsequently make the women happy and relieved [22,23].

3.3. Phase 3-growing up with changing values

'Growing up' was the final stage of the process of 'evolving meaning'. During this phase, these women were 'returning to normal life as before the earthquake'; 'being satisfied with new lives' and 'changing values toward earthquake, daily life and rearing a baby'. These results derived from the dynamic interactions of the women with the earthquake, through the process of 'alleviating disturbance' under the conditions of 'being there of the family members' and 'love and hope instilled by the baby', and with the even broader social support. In contrast to their status before the earthquake, these women evolved in their understanding of the meaning of their lives and family relationships, which represented their increasing maturity and 'growing up'.

The daily lives of women returned to the status of, or close to what it had been, before the earthquake with time went by. As participant D described it, she walked out of the shadow of the earthquake for good after her baby was delivered and she returned to work. In addition, almost all of the study participants were satisfied with their current lives after both the earthquake and childbirth, though they described a long time of difficult recovery before arriving at that stage.

Most importantly, the perinatal women had changed some of their values accordingly since the stressful earthquake. Values refer to guiding principles about what is important and desirable, which have dominating power in driving one's life, associated with both attitudes and behaviors [24]. Their changing values, which formed a strong motivational continuum for the women's growing up, were the result of their response to the disturbance of disaster, social support, and the baby. There were mainly three kinds of changing values, which were associated with the earthquake; the subsequent social support; and the birth of the baby.

The first kind was earthquake-associated changing values. As described in section 3.1, the positive effects of increased family cohesion and improved interpersonal relationships as a result of the disaster brought them a more positive attitude, and made them refrain from indulging in negative emotions such as sadness, fear and irritation. The women began to see that there were both positive and negative sides to

the disaster. The changing values could help them become better prepared and increase their resilience in facing unknown stressful events.

The second kind was associated with subsequent social support. The support that the women obtained after the earthquake not only touched them emotionally, but also made them change their values towards life and relationships with others. According to the participants, those changing values mainly included 'believing in a better life with hard work', 'cherishing family relationships and love', and 'actively giving back to others'. Participant A repaid her loan with her brothers and sisters' help and her own hard work. She was then able to believe in achieving a better life through hard work. In contrast, participant K was not fortunate because her husband was killed in a traffic accident after the earthquake. After the death of her husband, she had to assume all of the burdens of the family, and she was concerned, with doubts about a better future life. The women's beliefs in their efforts at realizing a better life was associated with whether they would receive instrumental and emotional support. Family support also induced the women's deeper understanding of the meaning of family relationships and love. The perinatal women presented their greater preferences for 'cherishing their love relationships with family members'. Participant U thought that it was true love that drove her husband to protect her during the earthquake, which stimulated her to cherish their relationship and love in their family life together. Besides, the support those women received brought them a sense of owing others, which direct them to appreciate and 'actively giving back to others'. For instance, participant T thought there was no definite reason but love, that could explain the help she received. This inspired her to devote more concern to her students. All the above changing values helped to alleviate women's negative psychological responses, and represented a change in their understanding about the meaning of life.

The bearing and rearing of a new baby was a significant event to trigger the women's changing values after the earthquake and childbirth. The baby made the woman 'being more responsible', 'being tougher', and 'being there with the baby', which helped them feel assured in their role as a mother as well. The former two were very common for a new mother, who tends to prioritize the child's well-being [25]. The most representative changing values was 'being there with the baby for rearing'. It could be viewed as one of the consequences of the main experiences from the earthquake: 'being there of the family members' and the childbirth. After the earthquake, the women found 'being there of the family members' to be the best support for themselves, as well as for their loved ones. They also rethought their direction of bringing up their children, and decided that simply 'being there' was the best approach for raising their children. Participant H thought that earning more money was the best for her daughter in the past. But after the disaster and the birth of her second baby, she believed that 'being there of the family members' is best for her children.

With these changes, most participants thought that they had grown up, in comparison with their past. In the following theoretical sampling, the interviewer asked about the meaning of 'maturity' and 'growing up', the participants responded that they were their changing values. Participant S summarized maturity as 'assuming more responsibility' and 'being tougher' (Table 5). 'Growing up' is a product of the interactions between earthquake and childbirth.

3.4. Evolving meaning

The women were changing values as a result of their interactions during the time of the earthquake, the presence of their family members, and the baby. The changing values were earthquake-associated, subsequent social support-associated, and baby-associated, which represented the new meanings that evolved from the beginning of the process until the final stage of growing up as shown in Fig. 1. According to symbolic interactionism, an individual acts on the meaning of events, which is derived from and changed by interactions in past and present social processes. Meaning thus are embedded in the recovery process from a

traumatic event. Through the experience of the earthquake and childbirth, the women reflected on their lives over that period, and eventually achieved a new understanding of the meaning of life, relationships, and rearing of the baby. It seemed as though they broke through a cocoon and evolved into a more mature mother, with their evolving meaning after all of those perceived adverse events.

4. Discussion

4.1. Phase of 'being disrupted'

The sense of 'being disrupted' was a common experience of victims after a disaster [26,27]. During the 'being disrupted', although the perinatal women experienced disturbances in daily life as other victims, there were different aspects of the participants in the present study compared to victims of other disasters. The context of childbearing produced higher requirements in the normal daily lives of perinatal women after the earthquake [28]. For instance, the requirements for good nutrition and a safe residence are higher for pregnant women than for the general population, in order to ensure fetal growth and maternal health [29]. These exceptional demands, mainly caused by the baby, relatively increased the sense of being disrupted and caused greater psychological and emotional responses, compared to general victims of an earthquake [30]. The higher level of negative psychological responses might also be explained by the lack of adequate preparedness of perinatal women. Many of them believed that the earthquake could not occur near them. Parenting programs during pregnancy might offer an opportunity to instill awareness of disaster preparedness in women and their families and help to decrease negative psychological responses from the unpreparedness.

In addition, perinatal women actually experienced decreased family support, yet ironically increased family cohesion after the earthquake. With the earthquake's contradictory impacts on family support, childbearing women held negative attitudes or values (at least in the beginning of the earthquake's aftermath), but these were mixed with somewhat positive attitudes as well.

4.2. Phase of 'alleviating'

During the 'alleviating' phase, decreasing but fluctuating psychological responses represents the unique pattern of perinatal women after an earthquake. Almost all surveys presented a straightforward declining pattern of negative psychological responses of survivors after disasters without any fluctuations [2,31–33]. In contrast with those participants, perinatal women in the present study unfolded their specific alleviating, mixed with fluctuations, psychological responses along with the comprehensive actions of changing hormones during the perinatal period, and the recurrent threat from aftershocks and reemergence of worries about the safety of their babies. The approximate patterns for the change in psychological health of general survivors and perinatal women are summarized in Fig. 3. Given the physical and psychological particularities of the perinatal period, the curve representing the psychological health status of perinatal women was lower than that of general survivors from the beginning, before a disaster. There was a decline in perinatal women's psychological health, which would later gradually increase, after the baby-birth, in comparison with general survivors. This pattern suggested that the time around the delivery is important for the maintenance of women's mental health after an earthquake, which should be considered for interventions. It is better to involve psychoeducation in the routine care of perinatal women during the perinatal period, especially close to the time of delivery.

4.3. Evolving meaning

Perinatal women had their own meaning constructed towards their lives, relationships, and baby-rearing, before the disaster. These values

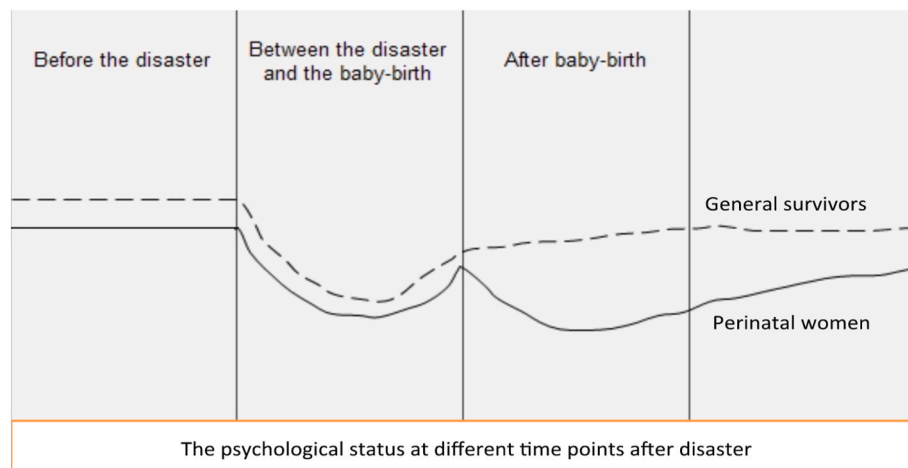


Fig. 3. Illustrative patterns of the psychological health of general survivors and perinatal women.

were changing during and after the earthquake, and evolved during their process of coping with stress from the traumatic event. Finally, their new meanings were established, which were the indicators of 'growing up'. The most similar model of the 'evolving meaning' is the one for the role of constructed meaning in response to a traumatic event by Fife [34] (Fig. 4). In Fife's model, meaning was developed through a dynamic interpretive process, which consisted of two inextricably linked dimensions (self-perception and social response). These two dimensions constituted an individual's meaning of the event, which evolved as to whether she/he combated to cope with the stress and adapt to the changes. With the new meaning constructed, it facilitated adaptation as the outcome and alleviates negative psychological responses. However, baby as a factor in 'evolving meaning' could not be incorporated into or explained by Fife's model. The presence of the baby was a special existence that could not be treated as either the social response or self-perception for perinatal women. According to data analysis from the present study, having the new baby carried a special meaning that motivated these women to cope through the love and hope instilled in them. This factor could help directly relieve negative psychological responses. On the other hand, it triggered both self-perception (being a new mother) and social response (being vulnerable as a childbearing woman who needs support) that demanded the women recover. The theoretical sampling with participant F and her husband clearly indicated that the baby meant both hope and the sustenance of life. Such meaning for the women motivated them to change their values and adapt to their psychological responses.

Another similar concept as 'evolving meaning' is the Posttraumatic Growth (PTG). The PTG was defined as a subjective experience of positive psychological change experienced because of the struggle with a major life crisis [35]. The changes brought by PTG include sense of personal strength, recognition of new possibilities for one's life, increased appreciation of life, closer relationships with other people,

and a richer spiritual life [36]. Among those, the latter three changes occurred in participants in the current study. However, those studies associated with PTG after disasters were mainly focused on adolescent or general survivors [36,38] which had inadvertently omit the functions of baby for pregnant woman.

Therefore, 'evolving meaning' was different by various degrees from other relevant resilience model. It had uniqueness that represented a special process for perinatal women in the face of disaster.

5. Limitations

The women, during the first trimester of pregnancy, might not have recognized their early pregnancy before the first prenatal examination, which usually begins at the end of the first trimester. They might have the similar feelings to general survivors of disaster without pregnancy, and was precluded in the study for better focus and quality of data. Therefore, it was difficult to investigate whether they had significantly different experiences from those in the second or third trimester. This specific issue actually provides a research direction to follow after this study. On the other hand, there was a limitation in sampling of family members as coding of the participants indicated that their close family members, e.g. husband and children, were particularly important for the women. The data collection should therefore include them, as many as possible, for theoretical saturation. However, only two husbands agreed to be interviewed. The smaller number of family members included in the study might reduce the quality of information for better theoretical saturation and representation. Despite the number, backgrounds of the two husbands represented two different situations surrounding the tentative categories for theoretical sampling, which provided relatively comprehensive and copious supplementary information for development and discovery of the resultant process. The researchers could continue to follow up this issue to achieve better theoretical sampling

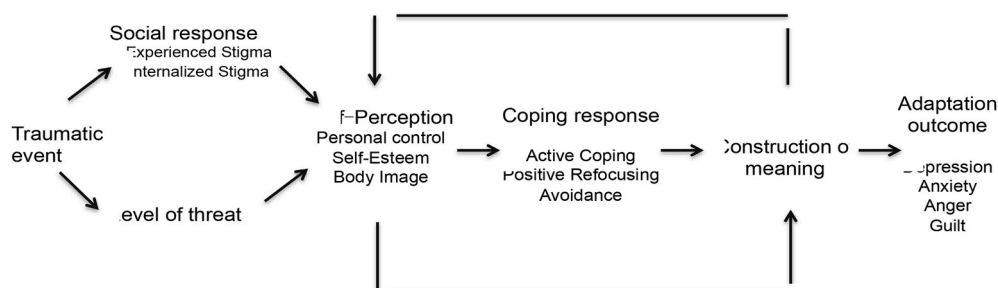


Fig. 4. Model for the role of constructed meaning in response to a traumatic event (Fife, 2005).

and reaching the level closer to higher saturation. Lastly, the timing or period or situation in which the family members were at women's side might be factors that could influence women's psychological status. Nevertheless, the data from participants did not indicate that the timing of their family members being there made an additional difference to them. We think that this question could be answered by a quantitative study in the future. This study aimed to construct a grounded theory that describes the process of pregnant women after the earthquake from the data of participants. It is limited for us to present both qualitatively and quantitatively. We have plans to validate the grounded theory and further identify the timing of being at women's side in the following study.

6. Implications for practice

This study suggests that baby played a key role in the recovering process of perinatal women after a major earthquake. Increasing disaster preparedness of those women through childbirth/parenting programmes may be particularly effective because it incorporates concerns for the health of baby with disaster preparedness. The pattern of decreasing but fluctuating psychological responses during 'alleviating disturbances', because of the changes in the endocrine system and increased fear from aftershocks and childbirth, indicates that the time around the delivery is important for the maintenance of women's mental health after an earthquake. Optimising perinatal services with more focus on psychological health around delivery could be considered as a direction for future interventions. According to the significant functions of 'being there of the family members' as found in this study, recommendations for clinical practice based on this key force should be made to improve the health of perinatal women after a disaster. Creating a special corner (a relatively separated place with privacy) in the ward for family gatherings, and involving husbands in the activities of daily living of pregnant women is advantageous for those women. Government and community corporation and resources should be sought to assure husband's availability after the earthquake in order to facilitate the being there with their wives.

7. Conclusion

The overall process of perinatal women after an earthquake was represented by a core category 'evolving meaning'. The meaning of those women that evolved over this process developed from 'being disrupted', through 'alleviating disturbances', to 'growing up' under the interactions of two categories as 'being there of the family members' (a type of support external to the women) and 'love and hope instilled by the baby' (an internal motivator). Through these interactions, the women were empowered and gradually recovering from their psychological disturbance in the face of 'changing values'. This process describes and explains in depth a process with the focus on a particular population (childbearing and childrearing women) in the context of a specific disaster (earthquake).

As an epilogue, we would like to quote the expression of participant S that captured integral parts of the essence of the perinatal women's experiences, feelings, and recognitions over the process of the earthquake and subsequent childbirth:

When there is an earthquake, because there was one, I think for friends, in particular when it is during the quake or a short time later, we've to treasure them very much. Because they are able to actively think of you. Very cherishing of them indeed. When the earthquake was over, my first feeling was a kind of great appreciation of them. The second feeling was about my daily life. That is, in this place, everybody is not just looking after their own. We care about each other and we have a harmonious relationship ... For my baby, it means the one for whom I must try my best to protect her, and even more when the earthquake strikes. She is the pulling force of my family cohesion (Second interview, line 23–33).

Declaration of competing interest

The authors declared that they have no conflicts of interest to this work.

We declare that we do not have any commercial or associative interest that represents a conflict of interest in connection with the work submitted.

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Further reading

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