FACTORS INFLUENCING POSTPARTUM ANXIETY AMONG MOTHERS IN WENZHOU, CHINA

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YAO CHEN

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR MASTER DEGREE OF NURSING SCIENCE
(INTERNATIONAL PROGRAM)
IN MATERNITY NURSING AND MIDWIFERY PATHWAY
FACULTY OF NURSING
BURAPHA UNIVERSITY
2024

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YAO CHEN

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรพยาบาลศาสตรมหาบัณฑิต (หลักสูตรนานาชาติ)

คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

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ลิขสิทธิ์เป็นของมหาวิทยาลัยบูรพา

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The Thesis of Yao Chen has been approved by the examining committee to be partial fulfillment of the requirements for the Master Degree of Nursing Science (International Program) in Maternity Nursing and Midwifery Pathway of Burapha University

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Postpartum anxiety is widespread among women. Compared to other mental illnesses, postpartum anxiety symptoms are mild and easily ignored. Longterm development of postpartum anxiety can lead to a variety of adverse outcomes. Mild postpartum anxiety can become a serious mental illness in the long run. The purpose of this study was to investigate postpartum anxiety and its influencing factors among women in Wenzhou, China. A total of 158 participants were recruited using simple random sampling in the postpartum follow-up clinic at the second affiliated hospital of Wenzhou Medical University. The data was collected using online questionnaires via WeChat mobile application. The questionnaires included a demographic questionnaire, the mental health literacy scale, the social support scale, and the Beck anxiety inventory. Descriptive statistics and standard multiple linear regression were used to analyze data.

The study results revealed that participants had a low level of postpartum anxiety. Breastfeeding, mental health literacy, and social support significantly explained 30.8% of the variance in postpartum anxiety. Mental health literacy ($\beta = -0.463$, $p = .000$), social support ($\beta = -0.16$, $p = .023$) were effective predictors of postpartum anxiety. Postpartum anxiety was significantly impacted when the participants no breastfeeding compared to exclusive breastfeeding (the reference category) ($\beta = 0.188$, $p = .022$). The differences among the exclusive and mix breastfeeding were not significant ($\beta = -.028$, $p = .722$). Meanwhile, age ($\beta = -.008$, $p > .05$) did not predict postpartum anxiety. Therefore, nurses should actively help women to obtain good mental health literacy and encourage them to continue breastfeeding. The family members and society should also be motivated to provide adequate support and care to women to reduce postpartum anxiety.

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CHAPTER 1
INTRODUCTION

Background and significance of the study

Anxiety is a common symptom of life for which postpartum mothers are prone to have it for various reasons. Women experience hormonal changes after giving birth. A decrease in the estrogen level will increase anxiety-like behavior during the postpartum period (Hedges et al., 2021). Regarding to role maladjustment, postpartum mothers face with overcoming process until increasing anxiety (Fonseca & Canavarro, 2020). One sign of maladjustment is when children form close relationships, leading to changes in the way women breastfeed. Another aspect is paying too much attention to children, which can lead to problems such as sleep deprivation.

Postpartum anxiety causes from many reasons. The health of infants is closely related to women's postpartum mental health, and unhealthy infants will lead to a high degree of postpartum anxiety in women (Clout & Brown, 2015; Helle et al., 2016). Meanwhile, the number of kids might be affected postpartum anxiety. The first-time mother will be more anxiety (Figueiredo & Conde, 2011). For the mother has other baby, it can both increase and decrease the level of anxiety. The reason has two aspects. On the one side of the coin, they need to take care of more children increasing pressure in childrearing (Wenze et al., 2015). On the other side of coin, they have more experiences to deal the trouble from care baby that can reduce anxiety. A study based on the attitudes toward motherhood found that the mother attitudes to conquer the mental barrier are associated with role transition adjustment as first-time parents (Sockol et al., 2014).

Postpartum rehabilitation problems also become the cause of women's anxiety. One of the problems for rehabilitation is postpartum weight retention, it will cause a high level of postpartum anxiety (Nagl et al., 2015). This can increase women's anxiety levels. Sexual function recovery is another one of the contents of postpartum rehabilitation, which also affects the level of postpartum anxiety (Karimi et al., 2019).

The pattern of postpartum anxiety has been studied by previous study which shaped development of anxiety in women from pregnancy to the end of birth (Agrati et al., 2015). Studies have shown an increased incidence of postpartum anxiety in the first few weeks after delivery (Pawluski et al., 2017) Development to the sixth week, maternal anxiety state mostly began to decline, slowly recover.(Killien, 1998).

The symptoms of postpartum anxiety can be manifested as physical and mental symptoms. Although the symptoms of postpartum anxiety are rarely studied and often overlooked. But research has shown that postpartum anxiety and postpartum depression symptoms are very similar (Gheorghe et al., 2021; Sawers & Wong, 2018). Physical symptoms such as insomnia, alopecia, sweating, shaking, reduced decision-making, etc(Sedov & Tomfohr-Madsen, 2021; Wenzel et al., 2021). Mental symptoms include anxiety, irritability, depression, and resistance to contact with children (Lutkiewicz et al., 2020; Osnes et al., 2020).

Some evidence shows the prevalence of anxiety in postpartum mothers. It is a widespread condition that affects the mental health of nearly 25% of the global population (Remes et al., 2016). For various reasons, Postpartum women are more likely to be anxious than others (Byrnes, 2019). A study pointed out that the probability of anxiety after delivery is 1.44 times that before delivery (Zappas et al., 2021). Based on the previous study, prevalence of postpartum anxiety ranging 14% to 40% (Field, 2018). In Shanghai, China, the prevalence of 6 weeks postpartum anxiety among women was 15.2% (Liu et al., 2020). This condition has been seen as less important than other mental illnesses such as postpartum depression. Compared with postpartum depression, only few scholars have conducted studies on postpartum anxiety, resulting in an insufficient understanding of postpartum anxiety (Dennis et al., 2017; Field, 2018). However, a high level of postpartum anxiety has a negative impact. Still, postpartum anxiety is easy to overlook. Research on postpartum anxiety is still insufficient internationally, including in China.

High anxiety during postpartum has adverse impacts on mothers, babies, families, and society. High postpartum anxiety affects maternal well-being. High postpartum anxiety causes discomfort in perceptions, views, beliefs, cognitions, feelings, physiological symptoms, and somatic symptoms (Wang et al., 2020). High postpartum anxiety is easy to cause panic, low spirits, loss of interest in environments

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leading to an unhealthy life (Fallon et al., 2018). Symptoms such as decreased appetite and distracted attention might appear (Fang, 2016). In addition, persistent high anxiety can develop into severe anxiety disorder (pathological anxiety), and even lead to mental illness, such as postpartum depression (Dennis et al., 2017).

High postpartum anxiety also influences their baby. On the one hand, maternal anxiety may affect the establishment of a mother-infant bond leading infants to lack security in their early years (Pawluski et al., 2017). This is more likely to cause emotional or cognitive disorders in children (Lefkovics et al., 2018). On the other hand, severe anxiety symptoms can affect maternal lactation leading to newborns' malnutrition conducive to poor growth and development in newborns (Fallon et al., 2016).

High anxiety during postpartum can ruin women's family. Mother's high postpartum anxiety may directly cause anxiety in fathers also (Suto et al., 2017). Father with high anxiety is more likely to escape from life's problems (M. Chen et al., 2019). Father with high anxiety is prone to role maladjustment, leading to an increased burden on mothers increasing the likelihood of family conflict (Charandabi et al., 2017). In China, mothers during the first month after giving birth are comprehensive care by family members, including maternal parents and parents-in-law. If women have previously been in poor relationship with these parents, high postpartum anxiety might cause them to have a more strained relationship leading to family discord (Long, 2020).

High anxiety in postpartum women burdens their society. High postpartum anxiety may increase the state budget for the treatment (Tandon et al., 2018). High postpartum anxiety women might be unable to return to work from schedule, leading to a waste of human resources in society (Dagher et al., 2014). Furthermore, mothers who experience high postpartum anxiety may refuse to have another baby (Ali, 2018), exacerbating the aging population. However, postpartum anxiety can be mitigated by health promotion behavior.

Postpartum anxiety can be impactive decreased by some method. Controlling maternal age is an impactive way to prevent postpartum anxiety (Misri et al., 2015). The secretion of milk can significantly affect the maternal mood, adhere to breastfeeding can impactive reduce women's anxiety. Social support, especially from

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family, can significantly reduce anxiety in women (Razurel et al., 2017). Severe postpartum anxiety that persists requires referral to a professional psychiatrist and medical treatment under the supervision of a physician (Meltzer-Brody et al., 2018).

This study applies positive mental health surveillance indicator concept and literature reviewed as a research framework (Korkeila et al., 2003; Waddell et al., 2013). This framework focuses on the risk factor that effect mental health status and deviation. There are 4 domains including individual, family, community and societal level. For this study, all the positive mental health surveillance indicator framework components with some related variables will be examined. Individual component (i.e., age, health literacy, breastfeeding), family component (i.e., social support), community component (i.e., social support), society component (i.e., social support), and mental health outcome (i.e., postpartum anxiety) are selected for this study based on supporting evidence.

Age is related to postpartum anxiety. On the one hand, women who give birth at younger ages (e.g., age < 18 years) have less physical and mental development to cope with the stress during perinatal birth. They are easier to have postpartum anxiety symptoms than pregnant women with an appropriate age. On the other hand, women older than 35 years have more risk factors and decreased physical recovery ability. Thus, they have greater anxiety than women of appropriate age (Garfield et al., 2015).

Health literacy is the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions (Parker et al., 1995; Ratzan, 2001). Based on a review of the literature and new thinking, Nancy et al. modified the definition: the degree to which individuals can obtain, process, understand, and communicate about health-related information needed to make informed health decisions (Berkman et al., 2010). Women with high health literacy are more likely to focus on their health assessment and know how to take care themselves and seek help. Therefore, health literacy can effectively reduce the occurrence of high degree of postpartum anxiety since provide the way to cope with problem. Increasing maternal health literacy of postpartum anxiety can be impactive reduce anxiety (Recto & Champion, 2017). From previous studies, they demonstrated the linkage between health literacy and postpartum

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anxiety. Health literacy is positively related to postpartum state and the degree of postpartum anxiety ($p < .05$) (Zibellini et al., 2021).

Social support is involved in postpartum anxiety. Social support obtained through social connection can reduce psychological stress and anxiety; and improve social adaptability (Liu et al., 2008). The study found that social support, especially from partners, is one of the important factors for the occurrence of postpartum anxiety (1 SD increase; aOR 0.59, 95% CI 0.40–0.85) (Dennis et al., 2017). Therefore, social support can also reduce postpartum anxiety (Racine et al., 2018).

Breastfeeding is also linked with postpartum anxiety. Breastfeeding a baby can lead to less sleep and increased stressors for mothers (Daglar & Nur, 2018), resulting in anxiety. In addition, breastfed mothers might be worried about their milk production affecting baby's weight gain (Forster et al., 2006). One study found that the occurrence of postpartum anxiety was associated with the cessation of breastfeeding (β 0.24; 95% CI 0.21-0.28); stopping breastfeeding can significantly increase the incidence of postpartum anxiety (β 0.11; 95%CI 0.09-0.14) (Ystrom, 2012).

In the existing research on postpartum mental health problems, more studies pay attention to postpartum depression, with less attention to postpartum anxiety (Dennis et al., 2017). Meanwhile, many scholars have studied the prevalence, risk factors, outcome, and influence of postpartum anxiety (Dennis et al., 2016; Fawcett et al., 2019; Grigoriadis et al., 2019; Rados et al., 2018). In China, only few research studies focus on postpartum anxiety. Since 2015, there have been nearly 100 independent studies on postpartum anxiety in China. Most of them are about the nursing, treatment, and prevention of postpartum anxiety. There is a study based in Zhuhai and Hong Kong on the risk factors of postpartum anxiety (Li, 2021). A study on the occurrence of postpartum anxiety and depression in primiparas and its influencing factors (Wang et al., 2020). There is a study on the occurrence and influencing factors of maternal anxiety within one week after delivery in Wuhan (Dai, 2020). As mentioned above, little is known about protective factors of postpartum anxiety.

Wenzhou is a city in Zhejiang Province of China with good economic development. There are few studies on postpartum anxiety among women in

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Wenzhou. The results might guide developing a nursing intervention to prevent harmfully high anxiety in postpartum women that might induce to postpartum depression. This might ensure the healthy development of mothers and their family, for which it will achieve the holistic care purpose of nursing care. Therefore, this study will investigate factors influencing postpartum anxiety among mothers in Wenzhou, China.

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Research objectives

1. To identify postpartum anxiety among mothers in Wenzhou, China.
2. To examine influencing factors of postpartum anxiety including age, health literacy, social support, and breastfeeding.

Hypotheses

Age, health literacy, social support, and breastfeeding could combine to predict postpartum anxiety among mothers in Wenzhou, China.

Conceptual framework

This study was guided by positive mental health surveillance indicator framework and literature reviewed (Parkinson, 2006; Waddell et al., 2013). The 4 domains are applied for studied variables including individual, family, community and societal domain. Age, health literacy, and breastfeeding are the individual component, family community and society component are defined as social support. Mental outcome of this study is postpartum anxiety. Thus, not only the specific variables (i.e., age, health literacy, social support, breastfeeding, and postpartum anxiety) are selected from model components but also selected to be investigated based on evidence supported. According to the positive mental health surveillance indicator framework, age, breastfeeding, and mental health literacy are identified as individual factors that influence postpartum anxiety. Social support is defined as a common factor of family, community and society, which affects postpartum anxiety.

Age is positively related to postpartum anxiety at both young age (Abulaiti et al., 2022) and advanced age (Fuchs et al., 2018; Silverman et al., 2017). Health literacy is negatively correlated with postpartum anxiety. Also, social support is

negatively related to postpartum anxiety (Racine et al., 2019). However, breastfeeding is positively associated with postpartum anxiety (Daglar & Nur, 2018). Thus, breastfeeding is still suspicious factor in term of affecting to postpartum anxiety and should be has more testing. This study aimed to confirm the association of selected factors with postpartum anxiety among mothers in Wenzhou, China. Diagram of the study. The research framework was demonstrated in Figure 1.

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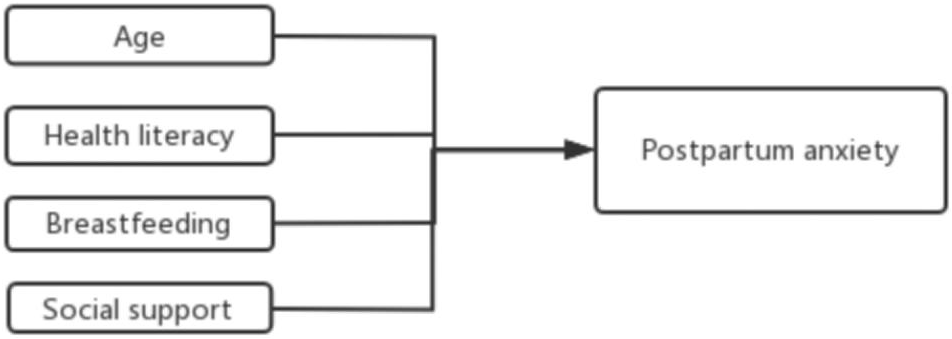

Figure 1 Conceptual framework of the study

Scope of the study

This study investigated influencing factors of maternal postpartum anxiety including age, health literacy, social support, and breastfeeding. The samples recruited from the mothers who have schedule visiting a 42-day-postpartum follow-up clinic at the second affiliated hospital of Wenzhou Medical University Wenzhou, China. Data were collected during July to August 2022.

Definition of terms

Age is defined as a number of alive years, the range from 20-35. It will be measured by a general information questionnaire developed by the researcher.

Health literacy is defined as health perception and coping ability of the postpartum mothers. It includes six components, including the ability to identify specific disorders or different types of psychological distress; knowledge and belief about risk factors and causes; awareness and belief in self-help interventions; knowledge and belief about the availability of professional help; attitudes conducive

to recognition and appropriate help-seeking; and how to seek mental health information. It was measured by mental health literacy scale (MHLS) (Jorm, 2000) which translated in Chinese by a research team composed of a psychology professor and 8 postgraduate students for measuring Mental Literacy (Ming, 2021) with original author permission.

Breastfeeding is defined as whether mother breastfeeds her baby. It including breastfeeding or not and whether exclusive breastfeeding. It was measured by general information questionnaire developed by the researcher.

Social support is defined as a perception of help received from other persons. It has two dimensions: support amount and support source. It was measured by the social support scale developed by Xiao (1994).

Postpartum anxiety is defined as a response to tense feelings during postpartum. It's a state of being anxiety. It consists of two subscales of physiological response and the anxious thoughts. It was measured by Beck Anxiety Inventory(Beck & Steer, 1990), in Chinese version, translated by Zheng (2002) with original author permission.

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CHAPTER 2
LITERATURE REVIEW

The study of factors influencing postpartum anxiety among postpartum women in Wenzhou, China is based on literature review. Contents of this chapter include:

1. Concept of postpartum anxiety

1.1 Definition of postpartum anxiety

Postpartum anxiety was defined as a common mental symptom of women after childbirth, which is jointly regulated by nerves, humors, society and individuals (Goodman et al., 2016). Postpartum anxiety is not a disease, but it can make people feel like a disease. Postpartum anxiety is often shown as excessive tension, panic,

nerve feeling amplification, thinking back and forth, inconsistent with usual behavior, serious people will appear physiological abnormalities (Andersson et al., 2006).

1.2 Pattern of postpartum anxiety

Childbirth is a normal physiological process. But for puerpera, this is a major stimulus, in this process will cause a lot of emotional response, which has an important impact on postpartum recovery of puerpera (Yang & Yu, 2015). Because of the change of endocrine hormone and victory function after childbirth, pregnant women will have different degrees of anxiety (Glynn et al., 2018). At the same time, maternal anxiety may also be caused by physical discomfort, husband's attitude, and the attitude of medical staff during childbirth (Chen et al., 2016). These factors can cause women, especially primiparas, to be unable to quickly adapt to motherhood. This can cause women to be sensitive, which can lead to a series of mental symptoms, such as obsessive-compulsive symptoms, stress, depression, and confusion about life (Lonstein, 2007; Pawluski et al., 2017; Tietz et al., 2014). High levels of stress can cause women to experience physical symptoms such as poor appetite, nausea, sweating, fever, and limb tremors (Beck & Steer, 1990; Lonstein, 2007).

Anxiety symptoms exist before, during and after delivery. Women showed different levels of anxiety depending on the stimulus they received. After delivery, anxiety levels returned to a relatively stable state (Paul et al., 2013). Under the stimulation of various factors, the degree of postpartum anxiety of women gradually increases over time. At 6 to 8 weeks, women become accustomed to the connection with their newborn, and anxiety tends to stabilize (Marques et al., 2018; Pawluski et al., 2017).

Researchers performed anxiety tests on women during pregnancy and postpartum 3,6,12,18, and 24 months. Prenatal anxiety was found to be high, and the anxiety at the end of production was significantly reduced. With the increase of postpartum time, the degree of anxiety is increasing (Agrati et al., 2015). Some studies have determined that anxiety is lower in the postpartum period than in the prenatal period, with an incidence of 17%-22% (Paul et al., 2013) in the early postpartum period and 15%-33% (Farr et al., 2014) in the late postpartum period. Paul et al. found that approximately 6% of women had high anxiety levels at 2 weeks, 2 months, or 6 months after delivery (Paul et al., 2013). Other study pointed out the

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highest rate of postpartum anxiety occur during the first few weeks (Pawluski et al., 2017). Anxiety symptoms begin to become apparent at 6weeks postpartum (Osborne et al., 2019).

1.3 Adaptation of women after giving birth

Women go through a series of changes after giving birth. Unbalanced changes in hormones (i.e., high prolactin, low estradiol, no progesterone, potentially low dopamine, and thyroid hormone changes) lead to postpartum mood changes (Trifu et al., 2019). Prolactin, estradiol, progesterone will conspicuously change the hormone of the whole body. Prolactin plays an important role as a neuropeptide. PRL regulates the stress response by inhibiting the hypothalamic-pituitary-adrenal axis. Increased PRL level can improve emotional response to a certain extent (Torner, 2016). The decline in estradiol begins 12 hours after delivery, and low estradiol levels are associated with increased anxiety (de Rezende et al., 2019). Reduced progesterone can significantly increase postpartum anxiety. Progesterone as the main progesterone, serum hormone level decreased significantly after delivery (Trifu et al., 2019).

Role change is an important transition for women after childbirth. Role reinforcement can cause women to focus too much on their children (Alimoradi & Nejat, 2019). The increased role of motherhood suggests that women need to spend more time caring for babies. It can lead to sleep deprivation. Poor sleep can increase the risk of postpartum anxiety (Okun et al., 2018). A diminished role can result in a woman's diminished responsibility for her baby (Fallon et al., 2016). The way to fed baby also affects the role adjustment of new mothers (Kassier & Madlala, 2018). Postpartum anxiety was negatively associated with initiation, duration, and exclusivity of breastfeeding (Adedinsewo et al., 2014).

The health of infants is closely related to women's postpartum mental health. Unhealthy infants will lead to a high degree of postpartum anxiety in women (Helle et al., 2016). Mothers who have unhealthy children tend to feel guilty. Premature infants, infants in the ICU are associated with low self-esteem in the mother (Matthies et al., 2019).

Though literature review, there are two different opportunities for the studies. Some think more kids lead high level anxiety, others think it is just the opposite. Multiple mothers will adjust the role of mother quickly than the first-time

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mother. Studies have found that new mothers experience difficulties in establishing mother-infant attachment in clinical Settings, which can increase anxiety levels (Lehnig et al., 2019). At the same time, the older baby can help to care the neonatal is important to release the anxiety level. On the other hand, the mother with more than one baby need to face more challenge. Like the economic pressure and care for more baby. China introduced a two-child policy in 2015 and a three-child policy in 2021. With the policy change, more and more high-risk women are appearing. The prevalence of postpartum anxiety in more kids mother is higher than one kids mother (Liu et al., 2020; Lu et al., 2020).

One of the problems for rehabilitation is postpartum weight retention, it will cause high level of postpartum anxiety (Hartley et al., 2018; Nagl et al., 2015). Many women consume large amounts to ensure breastfeeding after delivery, which leads to postpartum obesity (Christenson et al., 2016). Sexual recovery affects the relationship. It is reported that more than 60% of primiparas in China have low sexual desire, orgasm disorder, pain during sexual intercourse and other sexual dysfunction (Matthies et al., 2019). This can increase women's anxiety levels.

1.4 Prevalence of postpartum anxiety

The occurrence of postpartum anxiety is common. Worldwide studies on the incidence of postpartum anxiety show that the incidence of anxiety in the 3 months of postpartum is 13 to 40% (Field, 2017; Karukivi et al., 2015). The prevalence in North America is about 16.7% - 40.4% (Fawcett et al., 2019; Polachek et al., 2014). And it’s higher in South America (Cameron et al., 2016). The prevalence in Africa is about 11.4- 31% (Mutua et al., 2020). Anxiety disorders rank as the sixth leading contributor for cause of disability (Linder et al., 2020). The prevalence in Australia is about 12.7%-20% (Bener et al., 2012; Field, 2017; Woolhouse et al., 2016). The prevalence in Asia is about 13-35% (Edhborg et al., 2011; Liu et al., 2020; Sedov & Tomfohr-Madsen, 2021). In China, more studies have focused on postpartum depression, and the incidence of postpartum depression has been widely reported as 2.9% to 30% (Si, 2021; Xu, 2015). Postpartum anxiety is more common in life than postpartum depression. The prevalence of postpartum anxiety in China is about 15.2% (Liu et al., 2020). China is going through a transition from the one-child policy to the three-child policy, and maternal mental health issues are becoming increasingly serious (Guo et

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al., 2016). The prevalence of anxiety of women with a second child was 27.5% (Lu et al., 2020). Because the symptoms are more insidious, a lot of postpartum anxiety is ignored. In fact, the incidence of postpartum anxiety may be higher than previously studied (Field, 2018).

1.5 Symptoms of postpartum anxiety

1.5.1 Symptoms on physical

The main physical symptom of postpartum anxiety patients is insomnia. Children are easy to wake up at night, leading to female biological work and rest disorder, can not sleep at night, fall asleep easy to wake up (Osnes et al., 2020). Sweating and tremors are also common symptoms of postpartum anxiety. As a result of the feeling of anxiety, women's muscle groups tight, tremor, resulting in a feeling of tremor. Muscles heat up during exercise, resulting in increased secretion of sweat glands (Febriyanti & Dewi, 2022; Hawari, 2016). Women with postpartum anxiety often experience difficulty breathing(Türkmen et al., 2021).

1.5.2 Symptoms on psychiatric

As a result of the combination of hormones and anxiety, women often feel depressed and disappointed in the people and things around them(George et al., 2022; Vichi et al., 2021). This also causes women with postpartum anxiety to be irritable (Sun et al., 2020; Surmeli Onay et al., 2021). Women with postpartum anxiety also tend to be indecisive and have difficulty concentrating on thinking when facing things(Surmeli Onay et al., 2021)

1.6 Impacts of postpartum anxiety

1.6.1 Impacts on mother

Studies have shown that postpartum anxiety can significantly reduce a mother's confidence (Zietlow et al., 2014). The higher the postpartum anxiety, the lower the confidence in feeding the child, the more difficult it is for the mother to stick to breastfeeding (Adedinsewo et al., 2014; Hoff et al., 2019). Mothers who fail to breastfeed are more worried about their children's health, which increases anxiety levels. Such mothers are at increased risk of mental illness. Postpartum anxiety can easily lead to role disorders, manifested as lack or delay of emotional response to the infant, irritability, hostility, aggressive impulses or rejection of the child (Razurel et al., 2017).

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1.6.2 Impacts on baby

Postpartum anxiety impact baby from physical and mental development. It can reduce a mother's belief in her infant's upbringing. Eventually, postpartum anxiety leads to defective growth and development after birth (Fernandes et al., 2021). Studies have confirmed that postpartum anxiety will have a negative impact on the growth and development of newborns, such as growth, development, feeding, attachment, and sleep (Oyetunji & Chandra, 2020). In a prospective longitudinal study of primiparas and multiparas (n =306), maternal anxiety was associated with 10% of infant excessive crying and 12.2% of infant sleep problems (Petzoldt et al., 2016). Postpartum anxiety also leads early developmental outcomes of infants including neurosynaptic development, regulatory development, and developmental milestones (Pawluski et al., 2017). Like other mental health problem, postpartum anxiety also has impact on different types of child maladjustment (Fernandes et al., 2021). Mother's mental problems such as postpartum anxiety to infants tend to lead to mental problems in early childhood (Aktar et al., 2019).

1.6.3 Impacts on family

Studies have pointed out that there is a certain correlation between father's anxiety and mother's postpartum anxiety (Scarff, 2019; Walker et al., 2020). A recent study found that the more anxiety mothers are, the more anxious fathers are (Leiferman et al., 2021). A high degree of postpartum anxiety is likely to lead to a high degree of anxiety in the family environment, resulting in tension between family members (Racine et al., 2019).

1.6.4 Impacts on society

The state's fiscal expenditure increases because of the delayed return to work of mothers with postpartum anxiety and the increased cost of coping with anxiety, including spending on mothers and infants. A study in America estimated that untreated perinatal mood and anxiety disorders among 2017 births in the United States for 5 years total cost $14 billion. The average cost per affected mother–child dyad was about $31 800 (Luca et al., 2020).

1.7 Reduce postpartum anxiety

The occurrence of postpartum anxiety can be effectively reduced by reducing the effect of influencing factors on postpartum anxiety. Controlling a

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woman's reproductive age is the cornerstone of reducing anxiety. Women aged 18-35 were better able to regulate anxiety (Eberhard-Gran et al., 2003). Improve women's mental health literacy and cognitive management ability through education and knowledge popularization. Thus reduce the fear of disease and speculation, to reduce the purpose of anxiety (Smith et al., 2019). Increase social support including professional knowledge and skills support, family members help, financial support policies can effectively reduce maternal anxiety (Asselmann et al., 2020). Good breastfeeding can reduce anxiety (Woolhouse et al., 2016). Studies have shown that poor breastfeeding, such as nipple pain, too little or too much milk, mastitis and so on, can lead to increased anxiety in women (Cooklin et al., 2018). Coaching women to develop proper feeding habits can reduce anxiety.

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2. Concept of positive mental health surveillance indicator framework

Positive mental health surveillance indicator framework is conducted by Parkinson, Waddell et al., and Korkeila et al (Korkeila et al., 2003; Parkinson, 2006; Waddell et al., 2013). It is identified the components of the existing monitoring framework. Positive mental health surveillance indicator framework conducted to improve the mental health of the Canadian population. The final frame was determined by two revisions. An initial list of 5 outcome indicators and 77 potential positive mental health determinant indicators was identified. Twenty-five items were finalized (Parkinson, 2006).

Positive mental health surveillance indicator framework definitions of mental health, individual, family, community, and society (Orpana et al., 2016). The positive mental health surveillance indicator framework was selected to be conceptual framwork for this study since it is widely used for guide to enhance the mental health states. It encourages health professionals to provide positive resources to help patients seek the factors of mental health problem. It can also help nurses understand the major determinants of health behavior and decrease the factor’s impact for mental disorders.

Figure 2 Positive mental health surveillance indicator framework diagram (Orpana et al., 2016)

The positive mental health surveillance indicator framework does provide reasonable and accurate monitoring indicators for Canadian adult mental health. Medical staff are provided with a purposeful approach to nursing care. Effectively reduce the occurrence of social mental disease, disease etiology diagnosis to provide a reasonable basis.

The study using positive mental health surveillance indicator framework as a theoretical framework to confirmed the factors of postpartum anxiety based on the identification of risk factors for postpartum anxiety and depression. Through the research results, it can be the guide of clinical practice. For the adults, who living in the community and do not diagnosis with other mental illness, the feasibility of combining positive mental health surveillance indicator framework with this study was verified.

The other theoretical framework was compared with this one. Health promote model (HPM) definitions of people, the environment, health, illness and care. The HPM developed by Pender is widely used in research, education and practice

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(Pender et al., 2006). It encourages health professionals to provide positive resources to help patients achieve specific behavioral changes. HPM can also help nurses understand the major determinants of health behavior (Parsons et al., 2011).

Both frameworks encourage the promotion of human health through positive feedback. However, compared with HPM, the positive mental health surveillance framework is more suitable for this study, it pays more attention to the promotion effect of non-behavioral factors such as individual, family, community and society. In this study, several factors (age, social support, and mental health literacy) were more consistent with changing one's own attributes to achieve a healthy state. For breastfeeding, this behavioral factor can also be summed up in the individual factors, change the way of behavior, can achieve the standard of health status.

This study focuses on postpartum Anxiety. The dependent variable is regarded as the outcome, and independent variable as the factors in the positive mental health surveillance indicator framework. In the study risk factors link to age, health literacy, breastfeeding, and social support. Explore the risk factors of postpartum anxiety and reduce the occurrence of postpartum anxiety by controlling the risk factors.

3. Factors influencing maternal postpartum anxiety

This study examined age, mental health literacy, social support, and breastfeeding as related factors for postpartum anxiety. In this study, age, breastfeeding, and mental health literacy are identified as individual factors that influence postpartum anxiety. Social support is defined as a common factor of family, community and society, which affects postpartum anxiety. Moreover, all of variables are selected based on evidence support of literature reviewed.

3.1 Age

Age is defined as the number of years lived. Previous studies have shown that giving birth at the right age can reduce postpartum anxiety. Age was included as a predictor in this study. As most people know that maternal age influenced postpartum anxiety levels. Delivery age is too old or too young will affect maternal anxiety (Li, 2020). Older mothers are more likely to suffer from postpartum depression. Women older than 35 are at more risk of adverse pregnancy outcomes, such as fetal dysplasia,

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pregnancy complications, and miscarriage, than women younger than 35 (Fuchs et al., 2018). Antenatal anxiety was more pronounced in women older than 35. The occurrence of prenatal anxiety increases the likelihood of postpartum anxiety (Ahmed et al., 2019). As a result, women over 35 are more likely to suffer from postpartum mental disorders (Silverman et al., 2017).

A study shows that postpartum anxiety is 50% higher among women aged 15 to 19 than among non-childbearing women of the same age. Postpartum anxiety was higher in women aged 15-24 than in other age groups (Swift et al., 2020). Thus, this study aimed to test associate of age and postpartum anxiety.

3.2 Mental health literacy

Health literacy can be defined as 'the ability of citizens to make sound decisions concerning health in daily life—at home, at work, in health care, at the market place and in the political arena (Quah, 2016). Mental Health literacy is defined as health perception and coping ability. Mental health literacy includes six components, including (the ability to identify specific disorders or different types of psychological distress; knowledge and belief about risk factors and causes; awareness and belief in self-help interventions; knowledge and belief about the availability of professional help; attitudes conducive to recognition and appropriate help-seeking; and how to seek mental health information (Jorm et al., 1997). Existing studies have shown that good mental health literacy can effectively reduce postpartum anxiety. In this study, mental health literacy was a factor influencing postpartum anxiety.

The ability to identify specific disorders or different types of psychological distress also called the recognition of mental health disorder. Recognizing mental illness as the first step to illness is critical. Be able to provide feedback when problems occur (Herrán et al., 1999). Often mental illness develops severely because of a lack of timely recognition (Regier et al., 1988). Knowledge and belief about risk factors and causes is the most important for prevent the anxiety. A correct understanding of the etiology can improve patient adherence to treatment (Buckwalter & Schaffer, 2015). Some patients mistakenly treat their anxiety as a result of supernatural forces (Nichols, 2017). This tends to delay the illness and make the symptoms more pronounced. Awareness and belief in self-help interventions impact the people proactive and ask for help. People who have a positive attitude toward

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treatment tend to have better mental illness outcomes (Camm-Crosbie et al., 2019). Stigma is a major obstacle to recovery (Silva et al., 2018). Knowledge and belief are the availability of professional help. Trust in the doctor is an important measure to overcome anxiety (Infante‐Gil et al., 2022). Attitudes conducive to recognition and appropriate help-seeking is the attitude to facing the symptoms. Many people have mental disorders as a stigma, especially family members have prejudices, and women are more reluctant to face it (Waller & Turner, 2016). How to seek mental health information is also the method to deal with the anxiety right or not. More and more ways of popularizing science have been opened up in China (Jiang, 2002). Internet search, publicity board popularization, hospital professionals in the community publicity, etc. But superstition and false knowledge propaganda still exist. Being able to look critically at received knowledge is critical.

From previous studies, health literacy is positively related to postpartum state and the degree of postpartum anxiety ($p < .05$) (Zibellini et al., 2021). A study results suggest that postpartum mental health problem significantly is associated with limited health literacy (OR: 0.97, 95% CI:0.95-0.99, P=0.033) (Khoei et al., 2017).

3.3 Social support

Social support is defined as help from outside sources, including family, community, and society. Studies have shown that women with good social support have lower levels of postpartum anxiety. In this study, social support was a good predictor of postpartum anxiety. Social support includes personnel support and financial support. These supports, both at home and outside the home, can significantly affect postpartum anxiety. The most important support is from family. The lack of preparation for family relations and maternal psychological state after childbirth is the main source of postpartum women's anxiety (Harrison et al., 2020). The baby-care stress is related to the ability of family members to share the responsibility of caring infant. especially from husband, mother and other close relationship objects can be impactively reduce the possibility of postpartum anxiety (Alaem et al., 2019). A study in Shanghai, China, found that family support was impactive in reducing postpartum anxiety (Liu, 2021). Studies have shown that positive family intervention can impactively promote the mental health of postpartum mothers (Racine et al., 2019; Slade et al., 2020). Postpartum childcare is an important

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source of stress for mothers. As caregivers, mothers sleep less and tend to be more irritable. A study monitoring results from 57 programs are summarized that improving the role of infant care and family division can reduce postpartum anxiety (Dennis et al., 2016). At the same time, postpartum husband and wife relationship is an important factor affecting maternal psychological state, nearly 40% of pregnant women are anxious because of unhappy marriages (Odinka et al., 2018). Studies have pointed out that a big source of anxiety for Chinese women is living with in-laws (Zhou et al., 2020).

Care from social, such as from the professors provide professional knowledge to cope with the situation to care baby and help mother recover. One study investigated the relationship between information support and anxiety among primipara women over 35 years of age through interviews. Providing mixed information can easily lead to maternal anxiety (Carolan, 2007). A regressive study showed that postnatal mental health knowledge of the surrogate can effectively reduce postpartum psychiatric symptoms (Kingston et al., 2014). Economic support is also an important part. Family economic and social health insurance policies can significantly affect maternal anxiety. Lower socioeconomic status was associated with a higher risk of postpartum anxiety (Fawcett et al., 2019).

3.4 Breastfeeding

Breastfeeding is the behavior of mothers to feed their babies, including exclusive breastfeeding, mixed breastfeeding, and no breastfeeding. Previous studies have shown that consistent breastfeeding can reduce postpartum anxiety. Breastfeeding was a good predictor of postpartum anxiety in this study. Mothers who stick to breastfeeding are able to adjust to motherhood more quickly, which is inextricably linked to reduced postpartum anxiety (Virden, 1988). Studies have shown that children who are breastfed have better postnatal growth and development than those who are formula-fed (Kawano & Emori, 2015). A study was conducted in two peri-urban communities of Karachi, a mega city of Pakistan, has found that postpartum anxiety is related with children’s growth (Ali, 2018). As a result, formula mothers are more anxious about their children's development. Adequate breastfeeding can reduce maternal anxiety levels (Falah-Hassani et al., 2016).

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A study involved in 84 breastfeeding mothers, 99 formula feeding mothers and 33 unhealthy mothers showed that breast-feeding mothers had more positive emotions, reported more positive events, and perceived less stress than formula feeders (Falah-Hassani et al., 2016). A qualitative study has shown that women who fail to breastfeed are more likely to experience learned helplessness and feelings of guilt. This can lead to a higher incidence of psychological problems among women (Ji et al., 2020). Women who fail to breastfeed face pressure from outside and from themselves in countries with breastfeeding cultures, according to a Norwegian study. This can lead to more psychological problems (Hvatum & Glavin, 2017).

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4. Summary

Currently, studies on postpartum anxiety are being carried out worldwide. There have been many studies on the symptoms, occurrence time, causes, prevention and treatment of postpartum anxiety. In China, there are many studies on the factor correlation analysis of postpartum psychiatric symptoms. This is the research on anxiety as a separate subject. The incidence of maternal anxiety within 1 week after delivery was high in Wuhan, and the factors of maternal feeding anxiety after delivery were low age, low education level, no fixed job, premature delivery, dissatisfaction with marriage, postpartum separation and postpartum complications.

There are many studies on the influence of age, breastfeeding, health literacy and social support on postpartum anxiety. But at the same time, research shows that anxiety is often overlooked as a common symptom and this leads to more problems. On the other hand, studies on health literacy as an influencing factor are mostly about postpartum depression, and few studies have mentioned the correlation between health literacy and postpartum anxiety, which is worth our in-depth discussion. Through the database search, it is found that postpartum anxiety and postpartum depression are often diagnosed and treated as comorbidity. The research on independent postpartum anxiety is not thorough enough. That ignores the specificity of anxiety as a separate symptom (Zappas et al., 2021). The literature describing the postpartum anxiety mechanism stud is lacking. More importantly, relevant research in China is insufficient.

This study focuses on the influencing factors of postpartum anxiety in Wenzhou, China, which has guiding significance for the future nursing work. The results of the study on the impact of age, breastfeeding, health literacy, and social support on anxiety were also worth discussing. To solve the gap in these aspects in Wenzhou, China, our research was meaningful.

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CHAPTER 3
RESEARCH METHODOLOGY

This chapter presented research methodology, including research design, research setting, population and sample, research instruments, quality of instruments, ethical consideration, data collection procedures, and data analysis procedures.

Research design

The predictive correlational design was used to examine the influence of postpartum anxiety. The dependent variable of this study was postpartum anxiety. Predictors or independent variables included age, health literacy, social support, and breastfeeding.

Setting of the study

The study was conducted at a postpartum follow-up clinic of the second affiliated hospital of Wenzhou Medical University (WMU), located in Wenzhou, China. Services for clients in this clinic includes ultrasound examination, vaginal and uterine examination, recommendation of pelvic floor rehabilitation in case having vaginal relaxation, and recommendation of uterine incision in case having uterine prolapse. In addition, this clinic provides health education about postpartum contraception, postpartum calcium supplementation, and gynecological examination at 2-3 months after giving birth. However, there is no specific postpartum anxiety assessments with counseling services. This clinic is open on Monday, Tuesday, Thursday, Friday from 1:30 to 5:00 PM, and on Wednesday from 8.00 AM to 12.00 PM. It offers service to about 30-40 clients a day.

Population and sample

Population

The Target population in this study was postpartum women who having schedule visiting on 42-day-postpartum follow-up clinic at the second affiliated hospital of Wenzhou Medical University (WMU) in Wenzhou, China.

Sample

Participants were postpartum women visiting a 42-day-postpartum follow-up clinic at the second affiliated hospital of WMU, Wenzhou, China, who met study inclusion criteria.

Inclusion criteria

1. Age 18 years old or above

2. Have vaginal birth at the second affiliated hospital of WMU

3. Have a single baby with an APGAR score at birth not less than 8 and baby has been healthy till the day of postpartum follow-up.

4. Mother who have first child.

5. No physical and mental condition or mental illness as diagnosed by the psychiatrists that affect the participation in providing information.

6. No obstetrical complication.

7. Can communicate in Chinese and use WeChat fluently

Sample size

The sample size in this study is calculated by G*Power 3.1 program. Regression is chosen as a type of statistical test with an alpha of .05, a power of .95, a medium effect of 0.10, and the number of independent variables as 5. It generates a sample size of 132 subjects. In this study, 20% of the incomplete rate is used 26 subjects. Therefore, 158 participants are needed in total.

Sampling technique

1. After entering the postpartum review clinic, the follow-up women who met the inclusion criteria were selected for questionnaire survey.

2. The sample random sampling method was used to select 158 eligible participants who met the inclusion criteria.

3. Participants who was numbered one by one. And the participants code as the odd number was selected as the sample.

Research instruments

The researcher collected data via the WeChat application by using four questionnaires. Details of variables and these questionnaires were as the followings.

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General information

General information questionnaire was developed by the researcher. It has two parts: demographic and obstetrical. Demographics ask about age, education, marital status, occupation, family type, family economic status, living place, and primary caregiver. For obstetrical, it will be recorded by the researcher. These data include gravida, parity, abortion, alive child, gestational age when giving birth, vaginal birth mode, baby's weight (at birth & on maternal postpartum follow-up date), baby's age on maternal postpartum follow-up date, and breastfeeding.

Two of the variables in this study (age and breastfeeding) were obtained by means of the general information questionnaire. Age was recorded as number of living years. The study recoded breastfeeding into three categories: exclusive breastfeeding, mix breastfeeding, and no breastfeeding, and used two dummy variables denoting these categories in the analyses (exclusive= reference category).

Health literacy

The mental health literacy scale (MHLS) was developed by Jung et al. based on Jorm's Mental Health Literacy Scale (2000). The scale is suitable for assessing the level of mental health literacy of adult groups (Jung et al., 2016). The Chinese version was translated by a research team composed of a psychology professor and 8 postgraduate students for measuring Mental Literacy (Ming, 2021).

MHLS consists of 22 items with 3 dimensions: mental health knowledge (items 1-10), beliefs (items 11-18) and resources (items 19-22). The knowledge dimension is the forward question and the belief dimension is the reverse question. Both knowledge and belief dimensions were answered in the form of Likert scale and "don't know".

Six options were set: "strongly agree", "agree", "uncertain", "disagree", "strongly disagree" and "don't know".

For questions 1-10, and 19-22, "strongly agree" and "agree" count for 1, and all others count for 0.

For questions 11-18, choose "strongly disagree" and "disagree" for 1 point, and all others for 0 points.

The total score was the sum of the scores of each item, ranging from 0 to 22 points. The higher the score, the higher the level of mental health literacy.

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MHLS has been verified to have good reliability and validity (Ming, 2021). The Cronbach's α coefficients of internal consistency of the scale were 0.83, and the Cronbach's α coefficients of mental health knowledge, belief and resources were 0.76, 0.77 and 0.84, respectively. The results of EFA showed that the KMO test value was 0.81, and the Bartlett's sphericity test showed statistically significant difference ($\chi 2$ approximate = 2 574.73, $P < 0.001$). CFA was carried out on the 22-item scale with three factor structures after EFA. The results showed that the standardized load values of each item ranged from 0.31 to 0.82, and the fitting index was: χ 2 (206) = 541.47, χ 2 / DF = 2.63, GFI =0.91, RMR = 0.01, RMSEA = 0.06, AGFI = 0.90, which basically met the judgment criteria, and the model fit well. The convergence validity and discriminative validity of the retested sample scale were both good.

Social support

The social support scale (SSS) in the Chinese language developed by Xiao (1994) was used to measure social support received. It has 14 items of two subscales: support amount (items 1-9**)** and support source (items 10-14). Most items are 4-point Likert (ranging from 1-4 scores) with various options based on item contents. Two items (items 10 & 11) have scores ranging from 0 to 9, with 0 points for selecting "without any resource" and one point for selecting one of the remaining nine options. Possible total score ranges from 12-66. The higher the score, the better support the women get.

From previous study (Liu et al., 2008; Zheng, 2017; Zhou, 2015), its validity examined by correlation between subscales and total scale has coefficient values as .72 and .84. Its Cronbach’s alpha reliability is .69.

Postpartum anxiety

Beck Anxiety Inventory (BAI) translated into Chinese and used extensively, originally developed by Beck and Steer (1990), the Chinese version is translated by Zheng (2002) will be used to measure anxiety response.

It consists of 21 items with two subscales of physiological response including 13 items (1, 2, 3, 6, 7, 11, 12, 13 ,15, 18, 19, 20, 21), representing the physiological symptoms of anxiety and the anxious thoughts consists of 8 items (4, 5, 8, 9, 10, 14, 16, 17) representing different anxious thoughts. It is 4-point Likert scale

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ranging from ‘none’ or ‘no symptom’ (1) to ‘severe’ or ‘cannot stand that symptom’ (4).

The subjects added 21 self-rated scores to obtain scores. Possible total score ranges from 21-84 scores. The higher score, the more severe anxiety response women have. The score of BAI in three levels (low [21-41], moderate [42-62], high [63-84]) by the researcher(Y. Chen et al., 2019).

From study by Zheng et al. (2002), the resultsTable 1 of exploratory analysis (EFA) and confirmatory factor analysis (CFA) agree that the simple two-factor model is suitable to explain the factor structure of BAI. The CFI and BFI of BAI verified by CFA were 0.94 and 0.94 respectively. It shows the CFA model is obtained for examining its validity (Zheng et al., 2002). The EFA and Steep slope test shows that BAI has two factors including physiological response factor with an explanatory variance of 47.11% and the anxious thoughts factor with an explanatory variance of 7.70%. The total explanatory variance of the two-factor model was 54.81%, each factor had good internal consistency, and the correlation between the two factors was very high. It has Cronbach’s alpha reliability ranges from .91-.94 (Fydrich et al., 1992; Kwon & Oei, 1992; Liang et al., 2018; Oh et al., 2018).

Psychometric properties of the instruments

For validity, the Chinese versions of MHLS, SSS and BAI have already test for their validity.

According to instrument reliability for this study, the researchers used all instruments to collect data from 30 mothers who had the same characteristics as participants. MHLS, SSS and BAI should have Cronbach’s alpha coefficients of at least .8 (Liu et al., 2008; Zheng, 2017). The validity reports of each table were shown in Table 1.

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Table 1 Validity and reliability of the scales

	Validity	Reliability
Mental health literacy scale	The results of EFA showed that the KMO test value was 0.81	.85
Social support scale	Correlation between subscales and total scale has coefficient values as .72 and .84.(Zheng, 2017; Zhou, 2015)	.82
Beck Anxiety Inventory	The CFI and BFI of BAI verified by CFA were 0.94 and 0.94 respectively (Zheng et al., 2002)	.91

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Protection of human rights for subjects

The thesis proposal was submitted to the Burapha University Ethics Committee on Human Research (BUU EC) and Institution Review Board (IRB) of the second affiliated hospital of WMU. In the data collection process, mothers who met inclusion criteria and choose at random were informed about the study and the confidential and voluntary nature of the study by both telling and documenting. If they voluntarily participate in the study, they have the right to withdraw from the study at any time. Also, they were assured that their refusal to participate were not affect the service they received. Consent was signed by participants before data collection. All data were stored in a secure place. Study results were presented as an overview data, not link to any individual identity. Data were only be utilized for research dissemination, and it was destroyed after study results are published.

The study was carried out in the Second Affiliated Hospital of Wenzhou Medical University. The whole process was strictly in accordance with the government's and the hospital's COVID-19 protection policies. Before starting the collecting data, the researchers received education on hospital prevention and control measures. They were allowed to enter hospitals for research through quarantine tests.

Data collection procedures

The data collection procedures in this study were conducted by the researcher as follows:

1. After approval from BUU EC, the letter from the Faculty of Nursing, BUU was sent to the director and the letter was send to IRB committee of the second affiliated hospital of WMU, Wenzhou, China by the director of WMU.

2. After the researcher got permission from the hospital, both from its IRB and director, the registration records were approached in this study. The researcher introduced herself to the director, and postpartum follow-up clinic staff including head nurses, practice nurses, and doctors. The researcher explained to them about the study purposes and procedures. Then, the researcher asked the stuff for their permission for got in the clinic. The stuff helped to introduce the researcher to the patients and got the information about the information records for the mother and baby's health during pregnancy and delivery from the stuff in data collection.

3. The researcher was at the hospital before clinic official hours on weekdays (from Monday to Friday). The researcher searched the registration records to find the clients who met the study inclusion criteria. Then, the researcher used the sample random sampling technique to recruit participants.

4. The researcher introduced herself to clients, and inform them about the study, its purposes, data collection, and human rights protection. If clients voluntarily participate in the study, the researcher let them sign a consent form for signature verification.

5. Participants answered the self-report questionnaires via the WeChat application during their waiting for the service. They got the e-questionnaire composition by 4 questionnaires which including the demographic questionnaire (19 iterms), the mental health literacy scale (MHLS) (22 iterms), the social support scale (SSS) (14 iterms), Beck Anxiety Inventory (BAI) (21 iterms). The total duration was 20 minutes.

6. After participants' submission, the researcher checked for completeness of data. A total of 158 questionnaires were issued. There were 10 questionnaires were back incompletely, therefore, a total of 148 participants were included in the sample.

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7. The data was analyzed by SPSS 26 statistical software. Descriptive statistics was used to descript the general information and the variables. And the standard multiple linear regression was used to test the assumptions.

Data analyses

Data was analyzed by SPSS 26 statistical software. The alpha level of statistical significance was set at .05. The following statistical methods was used for data analysis.

1. Description of general information data (demographic and obstetrical) was analyzed by descriptive statistics.

2. Description of variables (both independents and dependent) were analyzed by descriptive statistics.

3. Influence of related variables (Age, health literacy, social support, and breastfeeding) on postpartum anxiety were analyzed by standard multiple linear regression. The data was tested for assumptions using standard multiple regression including normality of variables, linearity, homoscedasticity, no autocorrelation and no multi-collinearity.

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CHAPTER 4
RESULTS

The main objective of this study was to describe postpartum anxiety and its influencing factors on women. Data was collected from 148 postpartum women after 42-day delivery in the postpartum recover clinic of the second hospital affiliate to Wenzhou medical university. Data analysis of this data was done using descriptive and standard multiple regression statistics. The findings of this study are presented including demographic characteristics of participants, description of postpartum anxiety and factors of postpartum anxiety, and predicting factors of postpartum anxiety. The results were divided into four parts.

1. Descriptive data of participants' demographic characteristics
2. Descriptive data of dependent variable as postpartum anxiety
3. Descriptive data of independent variables
4. Standard multiple linear regression analysis

1. Descriptive data of participants' demographic characteristics

The demographic characteristics are presented in table 2. Participants' age range is 20-35. While the mean age for 28.56 (SD=3.52). The participants gravida from 1 to 7 while mean for 1.64 (SD=1.06). All participants just have one parity. The rang of participants abortion time for 0-6, with the mean abortion time for 0.64 (SD=1.06). All of the participants' gestational age were aged from 35-41 weeks with the mean age of 38.78 (SD = 1.36). All of newborns were healthy with APAGAR more than 8, the physical examination on 42-day showed normal growth. Majority of the participants married (96.6%), 58 females (39.2 %) educated by senior high school or junior college, 61 females (41.2%) educated by bachelor's degree, 34.5% of women are unemployed, 28.4% of women work for commercial stuff. More than half (54.7%) of households have deposit and no debt. Most of women were living at home after delivery 83.8 %. More women were cared by professional staff in postpartum maternity center who accounted for 80 (54%). Most of the participants chose to breastfeeding (77.0%), with 33.1 % choosing to exclusively breastfeed. And others didn't choose breastfeeding for 34 respondents that is 23 %.

Table 2 Demographic characteristics of postpartum women (n = 148)

Characteristic	N	%	Max	Min	Mean	SD
Age			35	20	28.56	3.52
< 25	22	14.9				
26-≤30	81	54.7				
31-≤35	45	30.4				
Gravida			7	1	1.64	1.06
Parity			1	1	1.00	0.00
Abortion			6	0	0.64	1.06
Living Child			1	1	1.00	0.00
Gestational Age			41	35	38.78	1.36
Education						
Junior high or below	10	6.8				
Technical secondary school	14	9.5				
Senior high school or junior college	58	39.2				
Bachelor's degree	61	41.2				
Master	5	3.4				
Marital status						
Married	142	96.6				
Single	2	1.4				
Divorce	3	2				
Occupation						
Unemployed	51	34.5				
Health care related worker	13	18.8				
Public official	22	14.9				
Commercial stuff	42	28.4				
Labor in production work, transportation work, or manual work	7	4.7				
Others	13	8.8				
Family economic status						
Have deposit, without debt	81	54.7				
Have deposit more than debt	18	12.2				
Have deposits less than debt	17	11.5				
Have deposits equal to debt	15	10.1				
Other	17	11.5				

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Table 2 (Continued)

Characteristic	N	%	Max	Min	Mean	SD
Residence (the first month after delivery)						
Home	124	83.8				
Postpartum maternity center	24	16.2				
Caregiver						
Parent(s)	28	18.9				
Husband	10	6.8				
Relative-in –law	30	20.3				
Professional staff in postpartum maternity center	80	54.0				
Breastfeeding						
Yes, exclusive breastfeeding	49	33.1				
Yes, mixed feeding	65	43.9				
No	34	23.0				

2. Descriptive data of dependent variable as postpartum anxiety

Postpartum anxiety as the dependent variable and its subscales were analyzed by descriptive statistics. Postpartum anxiety was measured using Beck Anxiety Inventory (BAI). It consists of 21 items with two subscales of physiological response and representing the physiological symptoms of anxiety and the anxious thoughts. The subjects added 21 self-rated scores to obtain scores. Possible total score ranges from 21-84 scores. Most participants (96.5%) had low anxiety, and only 3.5% had moderate anxiety as in table 3.

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Table 3 Description of postpartum anxiety level (n = 148)

Postpartum anxiety level	Score range	N	%
Low	21-41	143	96.5
Moderate	42-62	5	3.5
High	63-84	0	

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From table 4, the mean score of postpartum anxiety was 25.45 from range of 21-49 as shown low level. The mean score of physiological response were 15.44 (SD=3.21) and the mean score of the representing the physiological symptoms of anxiety and anxious thoughts were 10.01 (SD = 2.83).

Table 4 Description of postpartum anxiety among 42-day postpartum mothers (n = 148)

	Possible range	Actual range	Mean	SD	Level
Postpartum anxiety score	21-84	21-49	25.45	5.59	Low
Physiological response	13-52	13-29	15.44	3.21	
Symptoms and thoughts of anxiety	8-32	8-22	10.01	2.83	

3. Descriptive data of independent variables

From table 5, independent variables of this study, such as, age, health literacy, social support, and breastfeeding, were analyzed by descriptive statistics. Mental health literacy with mean score 11.72 (SD = 5.64), which three dimensions were mental health knowledge with mean score 6.62 (SD=3.35), belief with mean score 3.40 (SD=2.53), and resource with mean score 1.68 (SD=1.62).

Social support with mean score 40.38 (SD = 6.99), which has two dimension as social amount with mean score of 26.61(SD=4.51) and support source with mean score of 13.76 (SD=3.65).

Table 5 Descriptive data analysis results of independent variables (factors) (n = 148)

Variable	Possible score	Actual score	Medium	mean	SD
Mental Health literacy	0-22	0-21	12.5	11.72	5.64
Mental health knowledge	0-10	0-10	8	6.62	3.35
Belief	0-8	0-8	3	3.40	2.53
Resources	0-4	0-4	1	1.68	1.62
Social support	12-66	22-55	41	40.38	6.99
Support amount	9-36	13-34	27	26.61	4.51
Support source	3-30	6-23	14	13.76	3.65

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4. Standard multiple linear regression analysis

To examine selected factors (breastfeeding, mental health literacy, and social support) influencing postpartum anxiety, standard multiple linear regression was used for analysis. This statistical method had several assumptions that had to be met. Preliminary analysis was conducted to test the assumptions of the regression analysis which included normality of variables we studied, outliers, linearity, homoscedasticity, autocorrelation and multicollinearity.

The histogram and the Normal P -P plot showed the variables (age, breastfeeding, mental health literacy, and social support) were distributed normally. Scatterplots of the residual and partial regression plots showed the independent variables had a linear relationship with dependent variable and the data were homoscedastic. There was no multi-collinearity as the tolerance value of the model were >.1 and VIF values were < 10. Also, the multi-collinearity could demonstrate by the correlation ecoefficiency among predictive variables were less than .80 as show from Table 6. The Durbin-Watson value was 2.007 indicating that there is no autocorrelation. When all assumptions were met, standard multiple linear regression analysis was performed.

Table 6 Correlation coefficients between influencing factors and postpartum anxiety (n = 148)

	1	**2**	**3**	**4**	**5**	**6**
1. Postpartum anxiety	1					
2. Age	0.022	1				
3. Mix breastfeeding	-0.111	0.081	1			
4. No breastfeeding	.310*	-0.011	-.483*	1		
5. Mental health literacy	-.509*	-0.105	-0.053	-.196*	1	
6. Social support	-.217*	0.092	0.099	-0.11	0.072	1

From table 7, Standard multiple regression analysis showed that factors include no breastfeeding, mental health literacy, and social support accounted for 30.8 % of the variance in postpartum anxiety (Adj R2 = .308, F = 14.104, p <.001). Factors which significantly predicted postpartum anxiety are ordered from strongest to lowest: mental health literacy (β = -0.463, p =.000), social support (β = -0.16, p = .023). Postpartum anxiety was significantly impacted when the participants no breastfeeding compared to exclusive breastfeeding (the reference category) (β = 0.188, p =.022). The differences among the exclusive and mix breastfeeding were not significant (β = -.028, p =.722). Age (β = -.008, p > .05) had no statistical significance to postpartum anxiety.

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Table 7 Standard multiple linear regression analysis predicting factors of postpartum anxiety（n-148）

Model	**Unstandardized Coefficients**		**Standardized Coefficients**	***t***	***p***	**VIF**
	B	**SD Error**	**β**			
Age	-0.068	0.626	-0.008	-0.108	0.914	1.026
Breastfeeding						
Mix	-0.319	0.897	-0.028	-0.356	.722	1.355
No	2.49	1.075	0.188	2.317	.022	1.399
Mental health literacy	-0.459	0.071	-0.463	-6.475	.000	1.087
Social support	-0.128	0.056	-0.16	-2.298	.023	1.028

Note. R2 = .332, Adjust R2 = .308, F = 14.104, p <.001

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CHAPTER 5
CONCLUSION AND DISCUSSION

This chapter presents the summary and discussion of the study findings. The implication of the findings for nursing, limitation of the study, and recommendation for future research are addressed.

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Conclusion

The purpose of this study was to investigate the postpartum anxiety of women in Wenzhou area at 42 days, and to predict the related factors (age, breastfeeding, mental health literacy, and social support) affecting postpartum anxiety. Conceptual framework of this study based on positive mental health surveillance indicator framework (Parkinson, 2006; Waddell et al., 2013) and the literature review. Simple random sampling method was used to recruit the sample of 148 participants who gave birth at the second affiliated hospital of Wenzhou Medical University (WMU), Wenzhou, China and already 42 days after gave birth in July to August, 2022. Data were collected by using four research instruments which included the demographic questionnaire, mental health literacy scale (MHLS), social support scale (SSS), and Beck Anxiety Inventory (BAI). The reliability of instruments was tested in the 30 first-time fathers having similar characteristics. Cronbach's alpha coefficients of mental health literacy scale, social support scale, and Beck Anxiety Inventory were .85, .82 and .91, respectively. Data was collected through an electronic questionnaire by telephone. The participants scanned the QR code on WeChat and fill out the questionnaire. Data was analyzed using descriptive statistics, and standard multiple linear regression.

All participants were healthy during pregnancy and after delivery, and all their children appeared healthy after delivery. Among 148 women, the mean age of the participants was 28.6 (SD = 3.5, range = 20-35). Just 23% women do not breastfeed their baby, 33.1% women feed baby breast milk only, and 43.9% participants chose mixed feeding. Participants had mean value of mental health literacy as 6.62 scores (SD=3.35, range=0-10), social support as 40.38 scores (SD=6.99, range=22-55). Participants had low level of postpartum anxiety (M=25.45,

SD=5.59, range= 21-49). And its two subscales, physiological response and symptoms and thoughts of anxiety were low level.

Predictive factors include no breastfeeding, mental health literacy, and social support accounted for 30.8 % of the variance in postpartum anxiety (Adj R2 = .308, F = 14.104, p <.001). Factors which significantly predicted postpartum anxiety are ordered from strongest to lowest: mental health literacy (β = -0.463, p =.000), social support (β = -0.16, p = .023). Postpartum anxiety was significantly impacted when the participants no breastfeeding compared to exclusive breastfeeding (the reference category) (β = 0.188, p =.022). The differences among the exclusive and mix breastfeeding were not significant (β = -.028, p =.722). Age (β = -.008, p > .05) had no statistical significance to postpartum anxiety.

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Discussions

Postpartum anxiety

The postpartum anxiety in women who has given birth for 42 days in Wenzhou was at a low level with mean score of 25.45 (SD= 5.60). The result of this study is consistent with that reported in previous studies. It is worth noting that there are individual differences among partaking women (range=21-49), and those with scores greater than 45 are considered to be moderately anxiety (Zappas et al., 20. According to low level of anxiety in women, it might be explained by the previous study have been reported that postpartum anxiety is widely distributed in women, but the symptoms are not obvious (Dol et al., 2021). And minor anxiety is ignored and easy to develop into serious mental illness (Zappas et al., 2021).

Physiological response had a mean score higher than the mean score of anxious thoughts. The result would explain by the concept of postpartum anxiety symptoms. Physical responses were associated with significant hormonal changes during postpartum recover and changes in sleep and diet caused by caring for the baby (Hedges et al., 2021). The withdrawal of sex hormones in the postpartum leads to the activation of the brain hormone regulating axis and the decline of cortical function, which is prone to the production of anxious emotions and thoughts (Kundakovic & Rocks, 2022).

According to the intimacy between mother and baby, the previous research demonstrated the separation of mother and child are important reasons for women's postpartum anxiety (Liu et al., 2020). The women in this study were not separated from their babies after giving birth, therefore, they had a low level of postpartum anxiety.

The low level of postpartum anxiety could explain by the socioeconomic status of the women. Studies have shown that financial stress can cause fear and anxiety about raising children after childbirth, which can lead to significant postpartum anxiety (Suchan et al., 2022). This study was carried out in areas with good economic development in China, and the hospitals that carried out the study were well-known local hospitals. The population entering the hospital is in good financial condition (more than half of participants have savings and no debt). The less worried about financial pressure can lead to less anxiety as well.

Influencing factors of postpartum anxiety

Understanding the influencing factors of postpartum anxiety is an important public health concern because postpartum anxiety posed great health risks, particularly when it developing into a sever stage (Fallon et al., 2018). This study examined various factors and its association to postpartum anxiety, the findings of which are discussed below:

Mental health literacy: The data analysis of this study showed that mental health literacy was negatively correlated with postpartum anxiety and being the strongest predictor of postpartum anxiety ($\beta = -.459$, $p < .001$). The results are consistent with previous studies. Multiple studies have shown that people with higher mental health literacy are less likely to suffer from mental health-related disorders (Smith et al., 2019; Swami et al., 2020). Improving maternal mental health literacy can effectively reduce the occurrence of mental diseases (Kingston et al., 2014).

The explanation of such a strong correlation could be due to women with higher mental health literacy had more correct attitudes towards mental illness. Compared with women with low mental health literacy, women with high mental health literacy were more active in seeking outside help when they had negative mental symptoms, and had greater determination and courage to overcome negative symptoms (Lee et al., 2020; Smith et al., 2019), and they know more access to

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information about the symptoms occur of themselves (Swami et al., 2020). This can help reduce the likelihood of postpartum anxiety occurring and developing. Practice proof with the development of prenatal education, women have been receiving postpartum anxiety related education in the prenatal period, which has greatly reduced the occurrence of postpartum anxiety. Therefore, postpartum anxiety can be reduced by improving mental health literacy.

Social support: Researches have shown a strong relationship between social support and postpartum anxiety. Similar to the results of previous studies, the results of this study prove that social support is negatively correlated with the occurrence of postpartum anxiety ($\beta = -0.128$, $p < .05$). Good social support can significantly reduce the occurrence of postpartum anxiety symptoms (Arnold & Kalibatseva, 2021; Hetherington et al., 2018). The reason why women with good social support having lower levels of anxiety, the more support of women is the less stress to deal with from the outside world (Arnold & Kalibatseva, 2021). Women who have more time, supported person, money, material, and energy to adjust to motherhood, can reduces their anxiety level while coping with difficulties.

In China, there are strong traditional belief about first month recovery period, thus, society policy supports women to take care baby and their health during this time. However, different women receive different care, which leads to different levels of comfort after childbirth. Women with high levels of comfort had lower levels of anxiety. Some women (16.2%) go to the special maternity center in the first month to get the profession care from the professor matron. Others stay at home in the first month (83.8%). Some people can also get professional care at home (54%). The traditional way of confinement is to let the husband or elder take care of the woman at home (46%). Traditionally, women in confinement have many problems to pay attention to, such as not washing their hair, bathing, drying, and eating too much to ensure adequate breast milk. With the progress of times, scientific advice given by modern medicine is inconsistent with traditional ideas. The caregiver's receptivity to new knowledge determines whether the care women receive is scientific. Many women who receive traditional care are unable to meet their health and dietary needs in the first month after giving birth. Ineffective support led to increased anxiety in women. Women who received more support in the first month after giving birth had

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lower levels of anxiety, which is a strong indication that social support can predict postpartum anxiety.

Breastfeeding: Breastfeeding was inextricably linked to postpartum anxiety in women. Breastfeeding is divided into exclusive breastfeeding, mixed breastfeeding and non-breastfeeding. Persisting in breastfeeding has a positive effect on reducing postpartum anxiety (Mikšić et al., 2020). Women who did not breastfeed had higher levels of anxiety than those who exclusively breastfeeding ($\beta = 2.49$, $p=.022$). This is the same as the previous study that within the first six months of life, babies who were breastfed had better growth. Thus, the mother's anxiety level is reduced when the child grows well and being happy (Penniston et al., 2021).

There are several reasons why breastfeeding can reduce postpartum anxiety. Studies had prof that women who persist in breastfeeding have a higher sense of accomplishment, help to improve women's self-esteem and self-confidence, and facilitate the rapid adjustment to the role of mother (Coo et al., 2020). Well adapted role can effectively reduce the occurrence of postpartum anxiety (Riedstra & Aubuchon-Endsley, 2019). Correspondingly, women who can persist in breastfeeding show no obvious feeding difficulties and high self-efficacy. Women were indicated better mental state (Shao et al., 2022). It can be concluded that breastfeeding is one of important predictor of postpartum anxiety.

Age: Age did not significantly influence postpartum anxiety. In previous study, age is an important factor of postpartum anxiety in many ways. Older mothers tend to cause more complicated during pregnancy and childbirth than women of appropriate age. Older women are more likely to have anxiety after giving birth (Fuchs et al., 2018), and younger women often feel stressed about the responsibilities of raising children, which can lead to increased anxiety in women who is too young.

However, age was a not a good predictor of postpartum anxiety in this study ($\beta = -.068$, $p > .05$). The possible explanation of this finding could be due to the age range of women in the study was small and did not include high-risk mothers (age < 18 or > 35). The age range of women in this study was 20-35 years old. Given the fact that, such a finding for this study is not surprising. In term of Chinese country, the age of women giving first time birth is older. The age of low-risk primipara is within the suitable age range for pregnancy. At the same time, herd mentality led to large groups

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of women having children at an older age but having peer encouragement and feeling less anxiety (Kurdi, 2021). For these reasons, age could not predict the postpartum anxiety.

Implications of the study

The findings from this study further strengthens the fact that postpartum anxiety is a hidden psychological state, which is common in postpartum women, but it is often ignored because of its inconspicuous manifestation. It is important to enhance women's self-anxiety perception and coping ability. This is an important issue to prevent significant changes and promote women's mental health after childbirth. Following are the implications:

Nursing practice: In providing care to the postpartum women, nurses need to pay more attention to the mother's anxiety state. Anxiety screening can be performed regularly, so that targeted and timely intervention can be carried out for postpartum anxious mothers. Nurse could focus on enhance maternal mental health literacy in postpartum women. To improve maternal mental health literacy, the understandable and simple language format should be provided. Also, mental health literacy intervention can be designed and performed regarding to setting, age, time, and context of the participants.

Social support: In nursing practice, knowledge of raising children, methods to identify and reduce postpartum anxiety can be taught to mothers. Nurses can relieve women's postpartum anxiety through information support and family education in order to help them overcome smoothly transition period.

Breastfeeding: Mothers are encouraged to continue breastfeeding, but should do so at their own will by informing mothers of possible difficulties in breastfeeding. Breast feeding policy should be promoted with providing and helping atmosphere. Regarding mother mental state, breastfeeding can be supported through collaboration of mothers, nurses and family members.

Nursing education: Postpartum anxiety and intervention could provide in the nursing curriculum. Breastfeeding, mental health literacy, and social support should be more concerned to be protective factors. Significantly, the knowledge would provide appropriate care and preventive issues to prevent the postpartum anxiety.

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Limitations of the study

In the process of exploring the influencing of age and postpartum anxiety, the data range is narrow, which may not represent the whole situation. Since the data was collected from just one hospital in Wenzhou, China, the findings may have its limitations in generalizability. In the process of data collection, questionnaires were distributed via WeChat electronic media. The limitation of data given depended on the participant's skillful in using WeChat on mobile phone.

Recommendations for future study

For further study, the data collection should be more than one hospital or one region in order to expand the generalization. The other risk factors and protective factors should be explored more in term of cultural and socioeconomic contexts. These suggestions can ensure the update and complexity of the study.

Conclusion

The study examined the influencing factors of postpartum anxiety in the second affiliated hospital to Wenzhou medical university, China. The study involved women with healthy mothers and babies at 42 days postpartum. Most women presented low postpartum anxiety. Among the factors, mental health literacy, social support and breastfeeding commitment could significantly predict postpartum anxiety, which are all consistent with the findings of other researches in the past. In addition to that, this study also revealed findings that were different from other researches. The findings from this study could provide better understanding which lead to proper intervention development and policy regarding postpartum anxiety in Chinese health care context.

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APPENDICES

Dear postpartum mother,

I, a graduate student of Burapha University & Wenzhou Medical University, am conducting research entitled “Factors influencing postpartum anxiety.” With your voluntarily participating in the study, it will take time about 20 minutes to answer four questionnaires. These questionnaires include

1. General information questionnaire
2. Social support questionnaire
3. Mental health literacy
4. Postpartum anxiety questionnaire

Yao Chen
Master’s degree student
Maternity Nursing and Midwifery Pathway
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Questionnaire number: .....

GENERAL INFORMATION

Demographic questionnaire

Instruction: Fill in the blank or select option most related to you by marking √.

1. Age ..... years
2. Education
   - A. Junior high or below
   - B. Technical secondary school
   - C. Senior High School/Junior College
   - D. Bachelor's degree
   - E. Other (identify).....
3. Marital status
   - A. Single
   - B. Married
   - C. Other (identify).....
4. Occupation
   - A. No occupation
   - B. Healthcare personnel
   - C. Public officer of the state
   - D. Commercial staff
   - E. Farmer in agriculture, forestry, animal husbandry, or fishery
   - F. Labor in production work, transportation work, or manual work
   - G. Others, (identify) .....
5. Family member(s) include .....
6. Family economic status
   - A. Have deposit, without debt
   - B. Have deposit more than debt
   - C. Have deposits less than debt
   - D. Have deposits equal to debt
   - E. Other (identify).....
7. Where do you live during postpartum recovery?
   - A. Home
   - B. Postpartum maternity center
   - C. Other (specify) .....
8. Who has been primarily taking care of you during postpartum recovery?
   - A. Parent(s)
   - B. Husband
   - C. Relative-in-law
   - D. Professional staff in postpartum maternity center
   - E. Other (identify) .....

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GENERAL INFORMATION (CONTINUED)

Obstetrical record

FOR THE RESEARCHER

9. Gravida .....
10. Parity .....
11. Abortion .....
12. Living child including this new family member(s) .....
13. Date of delivery .....
14. Gestational age when delivery ..... weeks
15. Mode of delivery
    - A. Spontaneous vaginal birth
    - B. Instrumental vaginal birth: ( ) Forceps ( ) Others .....
16. Newborn birth weight ..... grams
17. Current weight of infant ..... grams
18. Current age of infant ..... days
19. Breastfeeding
    - A. Yes, feed baby with breast milk only
    - A. Yes, mix feeding
    - B. No

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MENTAL HEALTH LITERACY SCALE

Item	Strongly agree	agree	uncertain	disagree	strongly disagree	don't know
1. Psychological consultation and psychotherapy are effective ways to treat depression.						
2.People with schizophrenia may see things that aren't really there.						
3. Participation in interpersonal group therapy contributes to recovery from mental illness.						
4. Unexplained body pain or fatigue can be a sign of depression.						
5. Cognitive behavioral therapy can change the way people think and respond to stress.						
6. People with bipolar disorder show dramatic changes in mood.						
7. Taking prescription drugs is an effective treatment for mental illness						
8. A person becoming dirty and untidy can be a sign of depression.						

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Item	Strongly agree	agree	uncertain	disagree	strongly disagree	don't know
9. Drinking alcohol worsens the symptoms of mental illness.						
10. People with anxiety disorders worry or fear excessively.						
11. People with strong beliefs or spiritual pursuits do not suffer from mental illness.						
12. People with depression have weak personalities.						
13. Mental illness and mental problems cannot be prevented.						
14. Recovery from mental illness is largely a matter of luck.						
15. Mental illness can get better over time even if it is not treated.						
16. Once the symptoms of mental illness disappear, it is tantamount to completely cured.						
17. People with OBSessive-compulsive disorder can get rid of their compulsive behavior whenever they want to stop.						

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Item	Strongly agree	agree	uncertain	disagree	strongly disagree	don't know
18. People with depression can get better on their own without treatment.						
19. I know where to get mental health services.						
20. I know where to get useful information about mental illness.						
21. I know how to get the number for the suicide intervention hotline.						
22. I know how to contact the psychological counseling room, mental health center or relevant hospital in my area or work unit.						

Note: Three dimensions: mental health knowledge (items 1-10), beliefs (items 11-18) and resources (items 19-22)

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Social Support

Social support scale

Instruction: The following items mainly reflect support you receive from community. Check √ on the option most match with your situation.

1. How many close friends do you have that you can count on for support and help?

(1) None, (2) 1-2, (3) 3-5, (4) 6 or more

2. In the past year, you

(1) Live alone in a room far from family members

(2) Change of residence frequently and live with strangers most of the time

(3) Live with classmate(s), colleague(s), or friend(s)

(4) Live with your family

3. You and your neighbor

(1) We are only nodding friends

(2) May be slightly concerned about difficulties

(3) Some neighbors care about you very much

(4) Most of the neighbors are concerned about you.

4. You and your colleague(s)

(1) We are only nodding friends

(2) May be slightly concerned about difficulties

(3) Some colleague(s) care about you

(4) Most of my colleague(s) care about you

What amount of support and/or care received from each family member (tick √ in an appropriate option)

	None (1)	Few (2)	Fair (3)	Full (4)
5. Husband (lover)				
6. Parent(s)				
7. Son(s) or daughter(s)				
8. Brother(s) and/or sister(s)				
9. Other relative(s) (e.g., sister-in-law)				

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10. In the past, you have received financial support or help with practical problems from the following sources:

(1) Without any source

(2) From the following sources (can select more than one):

A. Spouse

B. Parent(s) (mother, father, mother-in-low, father-in-law)

C. Friend D. Other relative(s) (e.g., sister, aunt, etc.)

E. Colleagues F. Work unit

G. Official or semi-official organizations, such as Party groups or trade unions

H. Non-official organizations, such as, religious or social organizations

I. Others, (identify).....

11. In the past, you have received the following sources of comfort and concern in the times of emergency:

(1) Without any source

(2) The following sources (can select more than one):

A. Spouse B. Parent(s) C. Friend

D. Other relative(s) E. Colleague(s) F. Work unit

G. Official or semi-official organizations such as Party groups and trade unions

H. Non-official organizations such as religious and social organizations

I. Others, (identify) .....

12. Who do you talk about your troubles

(1) Never talk to anyone (2) Only talk to very intimate friends

(3) If friend asks you, you will say it

(4) Take the initiative to express your trouble to people around you

13. How to ask for help when you encounter trouble

(1) Only rely on oneself, don't accept others' help

(2) Seldom ask others for help (3) Sometimes ask others for help

(4) Often ask for help from family members, relatives, friends, and/or organizations when in difficulty

14. For organizing activities by groups (such as, caucuses, religious organizations, trade unions, student unions, etc.), you

(1) Never attend (2) Occasionally attend

(3) Attend regularly (4) Never absent

Notes: Two subscales: support amount (item 1-9**),** and support source (item 10-14).

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Postpartum Anxiety

Beck Anxiety Scale

Instruction: The following items are about general symptoms of anxiety. Please indicate the degree of which you are bothered by various symptoms from childbirth to present. Select an option by writing √ in a cell. Each option has meaning as below:
None = No symptom Mild = It's not too much of a problem
Moderate = Able to feel discomfort, but tolerable Severe = Can't stand

	None (1)	**Mild** (2)	**Moderate** (3)	**Severe** (4)
1. Numbness or tingling				
2. Feel warm				
3. The legs trembling				
4. Can't relax				
5. Worry something bad happening				
6. Dizzy				
7. Feel heartbeat faster				
8. Distract				
9. Frightened				
10. Nervous				
11. Hard to breathe				
12. Hand trembling				
13. Shaking				
14. Afraid of out of control				
15. Dyspnea				
16. Afraid of dying				
17. Panic				
18. Indigestion or abdominal discomfort				
19. Fainting				
20. Red face				
21. Sweating				

Thank you so much! And congratulations! May you be healthy and happy!

Notes: Two subscales: physiological response (item 1, 2, 3, 6, 7, 11, 12, 13 ,15, 18, 19, 20, 21), and the anxious thoughts (items 4, 5, 8, 9, 10, 14, 16, 17).

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