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Qualitative Study of Family Preparedness of Preeclamptic Pregnant Women without Severe Feature in the Even Occurrence of Eclampsia in Deli Serdang Regency

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Abstract Eclampsia cases in North Sumatra were 3.2%, and this figure is higher than the national figure of 2.7%. Eclampsia is an obstetric emergency condition in the form of seizures. Eclampsia appears as an indicator of poor labour and complication preparedness in the community. Family involvement of preeclamptic pregnant women without severe features in preventing eclampsia is needed through preparedness. This study aims to design a model of family preparedness of preeclamptic pregnant women without severe features to prevent eclampsia in Deli Serdang Regency. The study was qualitative with a phenomenological approach. Data were collected through in-depth interviews involving 23 families of preeclamptic women without severe features. The data were analysed using interpretative phenomenology analysis. A model of family preparedness of preeclamptic pregnant women without severe features in preventing eclampsia was found, consisting of 10 subcategories of 4 main categories, namely "knowledge and attitudes about preeclampsia," "utilization of health services," "preeclampsia emergency plan" and "resource mobilization". This model is an appropriate step in caring for preeclamptic pregnant women without severe features by families as the frontline in the prevention of eclampsia in the community before getting medical services in the hospital. The findings of this study serve as a guideline for the preparedness of families in the community.

Keywords Preeclampsia, Severe Feature, Eclampsia, Preparedness, Family, Model, Prevention

1. Introduction

Globally, maternal mortality continues to be a significant health issue. Roughly 94% of maternal deaths worldwide occur in developing nations [1]. In 2015, Indonesia's Maternal Mortality Rate (MMR) was 305/100,000 Live Births (LB) [2]. Indonesia's MMR is ranked second in the Association of Southeast Asian Nations, behind Laos [1]. The 2024 national objective of 183/100,000 LB [3], and the 2030 Sustainable Development Goal (SDG) target of reducing MMR to less than 70/100,000 LB [4], are still far off from this amount. In Indonesia, the rate of maternal death from preeclampsia was 33.07% [5], while the rate of fetal mortality was between 45% and 50% [6]. In North Sumatra, maternal mortality from preeclampsia rose from

16.1% in 2018 to 23.7% in 2019, and from 18.7% in 2018 to 28.5% in Deli Serdang Regency in 2019 [7].

Preeclampsia without severe features was defined as raised BP ≥140/90 mmHg plus 24-hour urine protein greater than or equal to 300mg/24 hour or urine dipstick >+1 after 20 weeks of gestation in previously normotensive women [8]. Preeclampsia cases in various countries range from 5-7% [9]. In Indonesia, preeclampsia cases reach 15% and 2.7% turn into eclampsia. In North Sumatra Province, eclampsia cases are higher than the national figure, namely 3.2%. [10]. The severity of the problem of preeclampsia not only has an impact on maternal and infant morbidity and mortality, but also has an impact on other long-term health problems, namely psychological disorders, reproductive system disorders and cardiovascular disorders [11].

The most successful programs worldwide are still those that aim to lower MMR, including those that result from preeclampsia and eclampsia. In Indonesia, some of these initiatives are Safe Motherhood (1990), Gerakan Sayang Ibu (1996), Making Pregnancy Safer (2000), Expanding Maternal and Neonatal Survival (2012), and in 2014, the government implemented a national health insurance program. Control programs related to maternal mortality due to preeclampsia have been conducted throughout pregnancy. Early in pregnancy, pregnant women are screened for preeclampsia, and pregnant women who are found to have at least two moderate risks or one high risk should be immediately referred to the hospital for further treatment. In the subsequent program, pregnant women at risk of preeclampsia are given low-dose aspirin and calcium supplements of at least one gram a day to prevent preeclampsia. Pregnant women who are found to have preeclampsia without severe features are given expectant care at the polyclinic, and the pregnancy is maintained until a viable gestational age. Mothers who have preeclampsia with severe features will be hospitalized until the condition stabilizes and given special treatment until postpartum [12].

Different endeavours have been made by the Indonesian government to control preeclampsia, but it has not been able to reduce cases of death due to eclampsia. Accidental eclampsia is a sign of inadequate preparation for birth and complication readiness [13]. Birth preparedness and complication readiness are strategies aimed at improving the timely use of professional services for mothers and babies, especially during labor [14]. Family beliefs, culture, and a lack of awareness have hindered preparation for labor and seeking care. For these reasons, pregnancy complications that occur in unprepared families take a lot of time to understand the problem, organize, get money, find transport, and reach the appropriate referral facility, causing delays in getting care [15]. A preliminary study conducted at a government hospital in Deli Serdang in 2019 found that 75% of mothers who died of preeclampsia arrived at the hospital already having seizures. This condition indicates a delay in referral. Understanding the reasons why mothers arrive at the hospital late is important [16]. Pre-hospital barriers should be the main focus and underline the importance of the first two delays in the three phases of delay: family decision-making and access to healthcare [17]–[19].

Childbirth preparedness and complication readiness have been associated with reduced maternal and new-born morbidity and mortality through improved maternal and family preventive behaviours [20][21] [22][23]. Promoting childbirth preparedness interventions can improve preventive behaviours and increase maternal knowledge of danger signs, leading to improved care-seeking during obstetric emergencies [24]. Childbirth preparedness and complication readiness are recognized as components of safe and low-cost maternal programs [25]. Successful childbirth preparedness programs have been found in Italy, where pregnant women who were intervened with a good preparedness program for labor and complications were two and a half times more likely to deliver in a health facility than women who were not well prepared [22]. Currently, preeclampsia management programs in Indonesia still focus on treatment provided in hospitals, with no continuity with home care. Current guidelines for the care of pregnant women at home refer to the Ministry of Health's Maternal and Child Health Book 2020. There are no specific guidelines regarding the care of pregnant women with preeclampsia at home. Therefore, to prevent the occurrence of eclampsia emergencies, improving the quality of care for pregnant women with preeclampsia at home needs to be formulated.

Based on the description above, it can be seen that the approach to overcome the problem of preeclampsia generally uses various empirical studies with an emphasis on health programs involving health workers as priority actors. The involvement of families of preeclamptic pregnant women as subjects who play a role in overcoming their health problems is still passive, waiting, and controlled by the existing system. Through disaster theory, overcoming deaths due to eclampsia needs to involve various parties. Families of preeclamptic pregnant women, as the closest individuals to preeclamptic mothers, need to be trained and improved as subjects who can independently and consciously perform preeclamptic preparedness in the face of eclampsia emergencies. Research on preeclampsia preparedness has never been done. So, with this, the author is keen on leading the exploration of the preparedness of preeclamptic pregnant women without severe features in dealing with eclampsia emergencies in Deli Serdang Regency. This study aims to design a family preparedness model for preeclamptic pregnant women without severe features for the prevention of eclampsia.

2. Methods

A qualitative phenomenological research design [26] was used to explore the family experiences of preeclamptic mothers. These experiences were obtained through in-depth interviews with families of mothers who gave birth 6 months postpartum and had a history of pregnancy with preeclampsia without severe features. This study was conducted in Deli Serdang Regency. This area is where the mother died. Participants were obtained from hospitals according to established criteria. The criteria were that at the time of the study the patient had been in the puerperium within the previous 6 months and had been diagnosed with preeclampsia during pregnancy.

The hospital contacted the patient and asked for his willingness to become a research participant. The first researcher conducted an in-depth information search until data saturation was reached for the 23rd participant. The researchers assessed participants' willingness to participate based on their communication skills and cooperation. Participants shared their experiences in treating preeclamptic pregnancies.

Interviews were conducted after obtaining written consent from participants at the agreed time. Data was collected through in-depth interviews lasting half to one hour. The interview guide that had been modified by the researcher based on preparedness theory, preeclampsia and eclampsia which had been validated by experts was used as guidance for the interview. Participants have the right to express their opinions without interruption. The interview began with the question "How do you feel about pregnancy with preeclampsia?" Participants were asked to provide information according to their natural conditions and free time to complete the remainder of the interview.

The researcher made field notes after each interview session. Interviews were audio-visually recorded in Indonesian and transcribed, stored digitally. Participants' names are encrypted. Data collection was carried out for two months in mid-2022. Ethical approval was obtained from the Ethics Committee of the University of North Sumatra.

The data analysis technique used interpretive phenomenological analysis [24]. The authors read the transcripts multiple times to familiarize themselves with the data and understand concerns about women's experiences with preeclampsia. During code revision, an iterative coding process was performed to evaluate the data and generate corresponding themes. In the data analysis session, thematic differences were resolved through discussion. When presenting the data at the end, the authors quoted the participants' sentences and presented them as answers.

3. Results and Discussion

3.1. Results

3.1.1. Demographic Data of Participants

The participants included 15 females and 8 males with ages ranging from 20 to 30 years, female gender, completed senior high school, worked as housewife, and had a family relationship as a mother (see Table 1).

Table 1. Demographic Data of Informant

Variables	Quantity (23)	Proportion (%)
Sex		
Female	15	65.2
Male	8	34.8
Age (years)		
20-30	12	52.2
31-40	8	34.8
41-50	2	8.7
Over 50	1	4.3
Education level		
Elementary - junior high school	9	39.1
Senior high school	11	47.8
Bachelor’s degree	3	13.0
Employment		
Housewife	11	47.8
Employee	5	21.7
Entrepreneur	5	21.7
Laborer	2	8.7
Family relationship		
Husband	8	34.8
Mother	9	39.1
Older sister	6	26.1

Table 2. Matrix Theme, Categories, Subcategories of Components Family Preparedness of Preeclamptic Pregnant Women Without Severe Feature in Facing Eclampsia Emergency

Theme	Categories	Sub-categories
Family preparedness of preeclamptic pregnant women without severe feature	Knowledge and attitude about preeclampsia	- Definition of preeclampsia - Signs and symptoms of preeclampsia - Dangers of preeclampsia
	Utilization of health services	ANC in hospital Delivery in hospitals with EmOC facilities Guidelines for family management of preeclampsia
	Preeclampsia emergency plan	Blood pressure control by family Identification of danger signs of preeclampsia
	Resource mobilization	Family support (physical, financial, spiritual) Identify transport

3.1.2. Main Results

Family preparedness of preeclamptic pregnant women without severe features was constructed by 92 codes, 10 subcategories and 4 categories namely: knowledge and attitudes about preeclampsia (with 3 subcategories of the definition of preeclampsia, signs and symptoms of preeclampsia and dangers of preeclampsia), utilization of health services (with 3 subcategories of Ante Natal Care (ANC) in hospitals, delivery in hospitals with Emergency Obstetric Care (EmOC) facilities, family management of preeclampsia), preeclampsia emergency plan (with 2 subcategories of family blood pressure control and identification of preeclampsia danger signs), resource mobilization (with 2 subcategories of family support and identification of transportation) (Table 2). The following sections describe the theme, categories, and subcategories.

3.1.3. Main Theme

Family preparedness for asymptomatic preeclamptic pregnant women is a different approach to the prevention of eclampsia, one that harnesses the social power of the family to be properly prepared and minimise the adverse effects of preeclampsia. The model is designed to activate families to maximize family resources by setting up a social infrastructure to improve health, move quickly, and act appropriately in delivering preeclamptic pregnant women to appropriate medical treatment at the hospital.

3.1.3.1. Categories and Subcategories

a) Knowledge and attitudes about preeclampsia

The experience of family members in accompanying preeclamptic mothers can increase family knowledge in managing preeclampsia without severe features. This experience and knowledge determine the family's attitude towards taking preventive measures for eclampsia. Based on their experience caring for preeclamptic mothers, the family was able to describe the definition, signs, symptoms and dangers of preeclampsia. The attitudes of the family were obtained from their experience in assisting preeclamptic mothers without severe features. This experience provides knowledge on how to handle preeclampsia without severe features in the family, which determines the family's attitude towards preventing eclampsia.

Definition of preeclampsia

Understanding the presence of elevated blood pressure in pregnant women by the family is the main basis for family preparedness.

"An increase in blood pressure during pregnancy was noticed when my wife reached 7 months of pregnancy, whereas when she had a prenatal check-up, her blood pressure was normal" (P4).

"Suddenly her blood pressure rose to 150 during this pregnancy" (P17).

Signs and symptoms of preeclampsia

Family knowledge of preeclamptic mothers about the presence of swollen extremities, dizziness, headaches and neck pain in pregnant women is an important alarm for early detection that makes families prepared.

"When she was 7 months pregnant, her body started to swell, previously the swelling was only on her legs. The sandals she used to wear could no longer be used because of the narrowness. My wife said her head was dizzy, had a headache, and she felt like her neck was being pulled. Then I took her to see the midwife, from the examination results, it turned out that her blood pressure was high" (P3).

"My sister complained of frequent dizziness, and it turned out that the results of the examination by the midwife found high blood pressure and positive urine protein 1" (P9).

Dangers of preeclampsia

The family's understanding of the dangers of seizures during pregnancy led them to be prepared to prevent them.

"The danger is short. One of them is that (pointing to the baby) or this (pointing to the preeclampsia survivor).

That is, for example, seizures or bleeding that causes one of them to pass" (P6).
"If a pregnant woman has a seizure, the chances of survival are minimal. The fetus can be disrupted or both die" (P8).

b) Utilization of health services

The health care facilities chosen by the families of preeclamptic pregnant women in conducting antenatal care and delivery at the hospital. In addition, there is a need for preeclampsia management guidelines that direct families to be prepared.

ANC at the hospital

Conducting antenatal care twice a week is a form of monitoring the development of preeclampsia cases suffered by pregnant women.

"*Every two times a month, a pregnancy ultrasound is done by an obstetrician, and we also consult with a midwife. If we feel headaches, we go directly to the midwife and she will tell us when to go to the hospital" (P18).*

Delivery at a hospital with EmOC facilities

Delivery of preeclamptic women without severe features does not always end in a caesarean section, but the threat of worsening preeclampsia is very rapid, so the delivery should be carried out in a hospital with EmOC facilities.

"Labour with preeclamptic severe features must be done in a hospital, it cannot be done by a midwife. Induction of labour is only done by obstetricians in the hospital. Why? When things go wrong, the process of performing surgery is fast in the operating room" (P21).

Guidelines for management of preeclampsia

An effective management system for preeclampsia is a form of protective function for preeclamptic women without severe features. Providing guidelines is a preventive effort that empowers families to increase their knowledge and awareness of pregnancy complications and to always be prepared to manage preeclampsia.

"I was crying, afraid of what would happen to my baby. I was confused about what to do. The midwife's guidance became our guide. Now my baby is healthy, his weight is also in accordance with his age" (P20).

c) Preeclampsia Emergency Plan

The process of planning activities carried out by the family immediately in the event of eclampsia to deal with the adverse effects caused, which includes activities to rescue and evacuate pregnant women to the hospital for rapid and appropriate treatment. The decision to take the mother to the hospital can begin with controlling blood pressure and the family's ability to recognise and understand the signs of preeclampsia.

Controlling blood pressure

Self-checking blood pressure has increased the family's awareness of the dangers of hypertension. Controlling blood pressure is a form of activating early detection of the dangers of preeclampsia.

"When my wife was pregnant, she told me that her blood pressure was always high. We had a tensimeter at home, so we measured our own blood pressure" (P20).
"After checking my blood pressure, I immediately reported to the midwife. The midwife will tell us what to do." (P18).

Identify the danger signs of preeclampsia

The identification of hypertension, severe headache and nape pain is the family's point of alertness in recognising the signs of preeclampsia with severe features or eclampsia and will encourage them to seek medical help from a doctor or clinic.

"The symptoms are dizziness, nape pain, hand numbness, swollen feet and hands" (P11).
"My wife vomited suddenly in bed in the middle of the night and vomited a lot, maybe because of her headache. At that time, I ran to the midwife and found out that my wife's blood pressure was 190/120." (P12).

d) Resource Mobilization

The management of pregnant women with preeclampsia needs to involve all resources in synergy. Family social infrastructure in the form of financial, spiritual, physical that exists in the family for emergencies that can support family preparedness in the prevention of eclampsia. Family support and transport support to reach the nearest hospital are needed.

Family support

Family acceptance of preeclampsia pregnant women who are consistently prepared to give help if necessary to create a sense of security, comfort and peace in pregnant women.

"This pregnancy with hypertension, we were with my wife for 24 hours during pregnancy and during labour. Our family took turns looking after my wife" (P12).
"My wife's pregnancy care is different from previous pregnancies. Pregnancy with hypertension is quite difficult and it costs a lot of money to see a doctor. I applied for BPJS to ease the medical expenses and my extended family covered the daily care costs" (P17).
"Facing this preeclampsia pregnancy is full of anxiety and uncertainty. Praying and surrendering to God made us calmer and really helped us to be ready for anything" (P8).

Identify transport

Transport needs to be prioritised for preparedness in preventing eclampsia. Families need to consider accessible means of transport to reach the nearest hospital. This also involves cooperation and support with nearby neighbours.

"The distance from home to reach the hospital is about

1.5 hours. There is no public transport in our village. We coordinate with neighbours who have a car on standby to take my wife to the hospital if needed" (P3).

3.2. Discussion

This study found a new concept in the form of a family preparedness model for preeclamptic mothers without severe features in preventing eclampsia. The family preparedness model of preeclamptic mothers without severe features was built by combining several existing theories of preparedness to help identify and explain the determinant variables that build family preparedness including: theories of birth preparedness and complication preparedness, community disaster preparedness, determinants of maternal mortality and triple delays and community context in modifying the model.

This model expands the concept of preparedness by adding family support in preparedness to prevent eclampsia through physical, financial and spiritual support. Furthermore, the research results were modified into a new conceptualisation as the basis for a series of actions to prevent eclampsia.

This exploration of the preparedness model was constructed based on the product of the research invention in the form of 4 themes which are indicators that build a model family readiness of pregnant women with preeclampsia without severe features in preventing eclampsia. These indicators include family knowledge and attitudes in caring for preeclamptic pregnant women, utilization of health services, emergency plans for preeclampsia without symptoms of ballast by the family and resource mobilization.

Family preparedness in the prevention of eclampsia is defined as a series of actions taken by families of patients with preeclampsia without severe features, starting from the diagnosis of preeclampsia, care during pregnancy, referral and preparing for delivery in the hospital. This preparedness is designed to facilitate pregnant women and their families in planning the actions needed to provide optimal care for preeclampsia patients without severe features during pregnancy and the components that must be prepared for delivery before getting medical services in the hospital. This study serves as a direction for the preparedness of families in the community.

Knowledge is the key to preparedness, knowledge about disasters in this case eclampsia is the main reason people take protective actions [27]. Research on family knowledge of preeclamptic mothers about preeclampsia in Indonesia has not been published. Knowledge about a disease is instrumental in the management of the disease. Adequate knowledge about the disease will contribute to the prevention, control and management of the disease [28]. Knowledge of the disease positively influences the ability to seek health care and adherence to care plans and treatment [29]. The higher the knowledge, the higher the level of compliance of pregnant women in the utilization of ANC services [30].

Mothers with good knowledge are more likely to have a complete pregnancy check-up, seek early hospitalisation, receive timely medical interventions and have fewer adverse outcomes [29][31]. Conversely, pregnant women with poor knowledge about preeclampsia are more likely to receive treatment late and subsequently develop complications of preeclampsia [32]. Lack of knowledge is also a predisposing factor to practice risky behaviour [33].

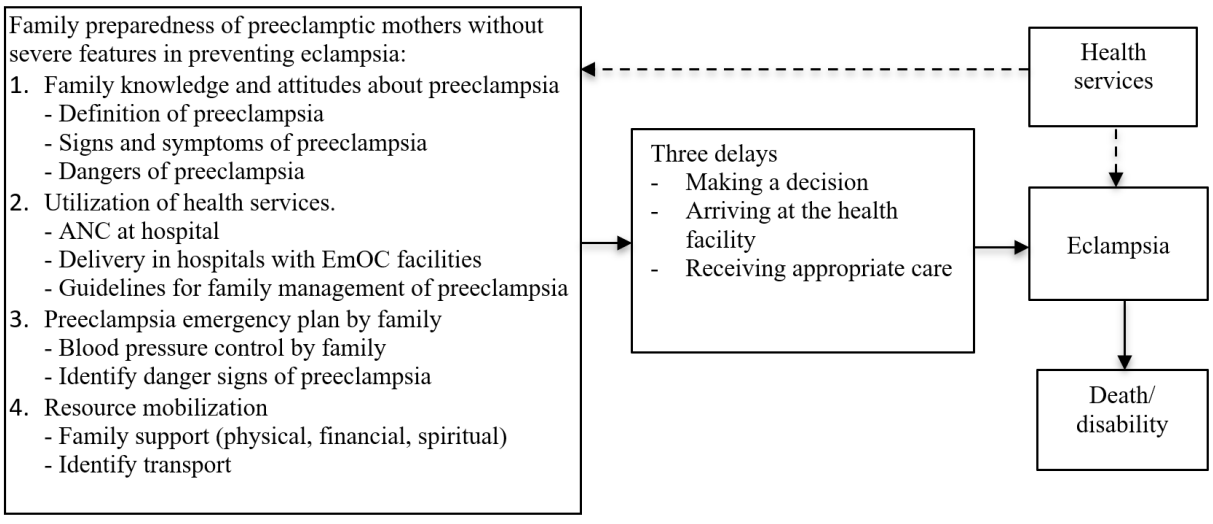

Figure 1. Family preparedness model of preeclamptic mothers without severe features in eclampsia

Attitude is a determinant of behaviour [34]. The manifestation of these attitudes can only be interpreted from overt behaviour, and attitudes are influenced by knowledge. Published research on family attitudes in the care of preeclamptic pregnant women without severe features has not been published, and most of the published research is on the attitude of preeclamptic pregnant women in caring for their pregnancy. The attitudes referred to in this research come from their experience accompanying preeclamptic mothers. This experience is a very valuable lesson for families in dealing with family members who suffer from preeclampsia, which in turn influences the family's attitude towards preventing eclampsia.

Utilization of health services by the family is a manifestation of the family's knowledge and attitude in managing preeclamptic pregnant women without severe features. Pregnant women with preeclampsia should have a prenatal check-up at the hospital when first diagnosed with preeclampsia. Preeclamptic mothers can be managed as outpatients if their condition is stable and they can be relied upon to report problems and perform blood pressure monitoring [35]. Specific ANC visits for preeclampsia cases without severe features referring to the preeclampsia PNPK agreed by Indonesian obstetricians in 2016 are twice a week in the hospital, with the aim of evaluating maternal symptoms and monitoring fetal welfare in pregnancies less than 37 weeks [12]. However, performing ANC twice a week for preeclamptic mothers is considered wasteful [29]. Performing ANC more than 8 times is known to protect against eclampsia through monitoring and early detection of preeclampsia danger signs [36]. Another essential component in preeclampsia obstetric emergencies is EmOC hospitals, as more than 70 per cent of deliveries for preeclamptic pregnant women are caesarean section [37].

Preeclamptic pregnancy is often described as a frightening and life-threatening condition. Anxiety associated with hospitalisation, frequent ANC, hospital procedures, caesarean section procedure, premature babies and separation from children is traumatic experiences for families. This indicates that there is a need for continuous information about preeclampsia, therefore efforts are needed to minimize this impact by increasing the preeclampsia information literacy skills of pregnant women and their families through guidance on preeclampsia care at home by families [38]. Information literacy is an effort to raise awareness of families in providing appropriate care to preeclamptic mothers[28]. Communication strategies in providing preeclampsia information in family preparedness can determine the success of the eclampsia emergency response to prevent the bad effects of preeclampsia.

The negative impact of eclampsia can be minimized by a preeclampsia emergency plan by the family. Controlling the blood pressure of pregnant women is a key alarm in the form of a preeclampsia emergency plan. Self-monitoring blood pressure (SMBP) monitoring facilitates early notification of the danger of preeclampsia and provides more opportunities for families to immediately intensify monitoring in response to uncontrolled blood pressure values. By involvement in SMBP, families are empowered to understand and recognize preeclampsia emergency alarms. SMBP may be lower than blood pressure measurement in the clinic [39], but significant when compared to the clinic environment although with a small margin [40]. If pregnant women, their spouses , or their families can increase danger signals of possible indications of preeclampsia without severe features, it will allow pregnant women to receive earlier interventions to prevent the development of preeclampsia and eclampsia [41].

Eclampsia risk reduction can also be done by preparing supporting facilities and infrastructure in the family that support the achievement of eclampsia risk reduction. The ability to mobilise resources in this case is more directed at the potential and improvement of family resources. Physical support that can be done by families such as skills in caring for preeclamptic mothers, regulating diet and assistance. Other support is financial support in the form of preparing BPJS, maternity savings, and daily preeclampsia pregnancy care costs. Equally important is prayer. Prayer is a tool for pregnant women to ask God as the ultimate care provider [42]. In addition, families should also pay attention to the means of transport that will be used, severe preeclamptic pregnancies are expected to quickly arrive at EmOC hospitals in less than an hour, so they can get the best possible medical care for their condition right away. Delays due to transport to facilitate treatment have been shown to lead to preeclampsia complications [42].

4. Conclusions and Recommendation

This study is a new approach that uses interpretative phenomenology analysis techniques in preeclampsia preparedness viewed from the family side. This research is a valuable finding in improving the understanding of how this preparedness model can mobilise the various resource capabilities that exist in the community, especially the families of mothers suffering from preeclampsia without severe features in the face of the occurrence of eclampsia.

The preparedness model produced by this study is a new framework consisting of four indicators that build a model to understand the preparedness of families of preeclamptic mothers without severe features in preventing eclampsia by increasing knowledge and building positive attitudes in caring for family members suffering from preeclampsia, making optimal use of health services, planning for preeclampsia emergencies and mobilising family resources allegedly can prevent eclampsia.

Recommendation

Health workers, especially midwives, as the closest health workers to pregnant women, need to provide education about the preeclampsia preparedness model to

the community, especially to families who have pregnant women at risk of preeclampsia. This model has been validated and is the right step as a solution to empower families in caring for pregnant women with preeclampsia without severe symptoms in preventing eclampsia in the community before receiving medical services at the hospital.

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