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Developing A Home-Care Program Based on the Needs of Mothers With Pre-Eclampsia: A Mixed Methods Study

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Abstract

Evaluation of the mothers with pre-eclampsia shows that the interventions and cares, provided in medical centers, are not sufficient to overcome the disease. Therefore, providing a part of care at home as one approach of health promotion can be a solution to improve optimal prenatal results due to these pregnancies and increase the quality of care. Few studies have been conducted on home-care programs for mothers with high-risk pregnancy in Iran. Thus, the objective of the present study was to develop a home-care program to promote health based on the needs of mothers with pre-eclampsia.

Method: This exploratory mixed-method research was carried out in four consecutive stages. In the first stage, the qualitative approach was applied to identify the needs and barriers of home-care for mothers with pre-eclampsia. In this stage, 28 mothers with pre-eclampsia, service providers, and policymakers of maternal health were included in the study purposively. Using individual semi-structured interviews and conventional content analysis, the relevant needs and barriers from their perspective were extracted. In the second stage, home-care challenges were explored through reviewing the literature. In the third stage, the initial draft of the program was developed by combining the results of qualitative data and reviewing the studies in the previous stage. In the fourth stage, using Delphi technique, 15 experts in the area of reproductive health and health service management judged the draft of the program remotely in the first round and as panel in the second round; as a result, a comprehensive home--care program for women with pre-eclampsia was developed.

Findings: Qualitative data analysis resulted in the formation of seven main categories includ-

ing psychological needs, supportive needs, educational needs, security and legal challenges, lack of acceptance of home-care among families, uncertainty about individuals in charge for supplying home-care costs, and lack of readiness of health system for providing home-care for mothers. The findings of the qualitative phase as well as the literature review were combined and the program was developed in two parts. The first part consisted of the structure of the program with a strategic viewpoint based on the analysis of beneficiaries and the second part included the role and description of individuals' duties and the care process.

Discussion: Providing home-care for mothers with pre-eclampsia involves with special obstacles. Therefore, to maintain and improve the health status of mothers with pre-eclampsia, it is necessary for care providers to present care to a greater extent rather than the usual.

Conclusion: Combining the data of the mixed-method study indicated that there are security-legal and cultural challenges in receiving care at home; the policymakers should provide the essential grounds in the society before implementing the program. Furthermore, the implementation of this program entails the existence of capable and coordinated human resources, infrastructures, and allocation of financial resources. Therefore, it is necessary for health managers and policymakers to consider home-care as a solution to promote the maternal health and improve the results of high-risk pregnancies. The present program comprehensively responds to the needs and barriers of home-care for women with non-severe pre-eclampsia by developing the objectives, key activities, and service-providing processes. It seeks to help promote maternal health in the current health service system structure by relying on values such as community orientation, health orientation, participatory approach, and justice orientation in health.

Keywords: Home-care; Needs; Barriers; Health promotion; Care program; Pre-eclampsia; Pregnant women with pre-eclampsia

Introduction

The improvement of maternal health is a prerequisite of development in societies. The fifth goal of the Millennium Development Goals, titled “improving maternal health in the framework of reproductive health”, highly emphasizes the point. Realization of this goal requires achieving a reduction in maternal mortality rate and complications of pregnancy and childbirth [1] The statistics reported from this organization shows that maternal mortality during pregnancy in developing countries is 18 times higher than that in the developed countries. Moreover, many mothers in developing countries suffer from the complications of pregnancy and childbirth [2]. Therefore, promotion of pregnant women’s health is of great importance in maternal health programs and realization of justice in health; as a health priority and one of the main concerns, it has been taken into account universally. High-risk pregnancies are among the leading causes of mortality and complication in pregnant mothers [4].

Hypertensive pregnancy diseases are one of the most common causes of high-risk pregnancies and have been mentioned in most countries of the world as the third leading cause of maternal death (after thromboembolism) [5]. In spite of medical advancements in the recent years, pre-eclampsia and eclampsia are still one of the leading causes of death in pregnant mothers [6]. Besides, high blood pressure is

still an iatrogenic underlying cause for premature birth that is regarded as one of the challenges of care in pediatrics [7]. Reviewing the studies conducted in Iran indicated that the prevalence of pre-eclampsia in different parts of the country is affected by factors such as age, parity, race, history of underlying disease, etc. As a result, the frequency of these disorders has been reported to be somewhat different in different regions and races [8]. It is deduced from the results that the prevalence of pre-eclampsia in Iran is considerably high. Moreover, reports show a 40% increase in the prevalence of pre-eclampsia in the recent decade; it seems that in the future polices relevant to maternal health, pre-eclampsia and the following complications should be considered as a serious problem for the health status of Iranian women [9].

Termination of pregnancy and long-term hospitalization has been always used as the common solutions to manage pregnancies endangered by pre-eclampsia. However, the current data indicate that prenatal consequences improve with expectant management, the mean gestational age increases with this treatment and more pregnancies approach the term [7]. Furthermore, many physicians believe that if the hypertension disappears or becomes controllable within a few days, it is not necessary to continue hospitalization and women with mild to moderate hypertension can be cared for at home [10]. regular monitoring and treatment of blood pressure in the early stages can greatly reduce the complications of this disease [4]. Hence, it can be mentioned that providing high-quality, effective and efficient care is one of the most important measures to protect pregnant women, especially when pregnancy has been threatened by causes such as pre-eclampsia. Providing a part of care during pregnancy at home is a way to make cares more efficient to improve prenatal results and reduce the complications due to these pregnancies [11]. Moreover, because the boundaries of mild and severe disease are not well defined, the care provided to these women must be consistent and continuous. Therefore, the treatment of mild pre-eclampsia should be in a way that the onset of the disease in the severe phase be diagnosed as soon as possible; it is also necessary to avoid unnecessary hospitalization. Furthermore, care should be taken in order to prevent diagnostic errors that lead to misdiagnosis of severe pre-eclampsia, unnecessary interventions, premature termination of pregnancy and premature birth. Thus, providing continuous home-care services along with outpatient and inpatient services seems essential for these women [12]. At present, prenatal care for mothers with high-risk pregnancies with a treatment-oriented approach is performed in health centers or specialized hospitals in Iran; there is no consideration of a specific home--care program for these pregnant women. Besides, due to the lack of proper feedback from medical centers to health centers, health care providers are not informed about the health status of high-risk pregnant women who have been hospitalized, and care is not provided in a complete and continuous manner. In this situation, many physical and psychological issues of mothers remain hidden from the view of service providers. In some cases, these people go to medical centers with acute conditions and even, in some areas, they do not go to health centers to receive services [13]. According to the reviews, there was no study conducted on the needs and challenges of home-care for pregnant mothers in Iran and the existence of unknown challenges may affect the implementation of the program. Socio-cultural context of society, expectations of mothers and families, and financial and legal issues are various dimensions that may affect the design, implementation and evaluation of the program. Therefore, identification of the needs and effective factors on the program is the first step.

Given the above and considering that the first step to promote maternal health is to recognize the care needs of mothers from their perspective (as recipients of services), the researcher sought to first identify the needs of home-care for women with pre-eclampsia during pregnancy through a qualitative study, and in the next stage of this study, to develop a comprehensive program based on the care needs of women and the opinions of experts and policy makers. Thus, it seems necessary to develop a home-care program for mothers with pre-eclampsia based on the needs and cultural, economic, and social conditions of pregnant mothers.

On the other hand, Providing regular prenatal care to all pregnant women, especially those at high risk of developing hypertensive pregnancy diseases, can help detect and manage the condition early on. This requires the availability of qualified healthcare professionals, adequate medical supplies, and fund-

ing for infrastructure improvements. Strengthening Health Information Systems, Reliable and timely data ,on maternal health is essential for policy-making and planning effective interventions. Health information systems in Iran should be strengthened to improve data collection, analysis, and reporting on maternal health outcomes

Therefore, the objective of the present study was to develop a home-care program based on the needs of mothers with pre-eclampsia.

Method

The present study is an exploratory mixed-method research that was examined by the ethics committee of the Research Deputy of Isfahan University of Medical Sciences and approved with code of … . First, through qualitative phase, the home-care needs and barriers of mothers with pre-eclampsia were explained using conventional content analysis from the perspective of mothers and key officials responsible for the health of pregnant mothers including care providers, policymakers of maternal health, and specialists in reproductive health.

In this study, the women with a history of pre-eclampsia and those currently suffering from pre-eclampsia were purposively selected with maximum variety in terms of age, educational level, number of pregnancies, severity of pre-eclampsia, and gestational age, among those referring to medical and health centers of Isfahan hospital. Moreover, pregnancy and obstetric care providers including gynecologists, midwives, heads of departments and health centers, maternal health policy makers, and reproductive health professionals were also invited to participate in the study. The participants took part in the study with informed consent and complete knowledge of the objectives. In-depth semi-structured interviews were used for data collection. The place of the interviews was determined based on the desire of the participants; as such, the interviews were held in Shahid Beheshti hospital, Ibn Sina Health Center, the place of work or life of the participants. Each participant was interviewed by the researcher in one to two sessions with an average time of 45 to 70 minutes.

At the beginning of the interview, the researcher described the objectives of the research and attempted to gain the trust of the participants. Then, verbal and written consent was obtained to participate in the research, to continue the cooperation and, if necessary, to conduct further interviews and permission to record the interview. The interviews were conducted individually in a quiet and private environment and if the participants wanted the researcher not to record the interview, notes were taken. Purposive sampling was continued until data saturation achieved. Data analysis was done through conventional content analysis, proposed by Graneheim and Lundman. After each interview, the recorded interview was transcribed word by word. The interview was regarded as the unit of analysis. Then, by repeated reading of the whole interview, the researcher achieved an overview that resulted in the formation of a meaning unit. Codes were extracted in the next stage. Then, similar codes were put in subcategories. The subcategories related to each other constituted the minor categories. Finally, minor categories were classified and main categories emerged (reference). Constant involvement with research data and reviewing data by participants and the research team, data validity increased. For data verifiability, the opinion of the researchers outside the study was taken into account. To increase the trustworthiness of data, the research stages were exactly reported so that other researchers can follow up. Data transfer capability was enhanced by giving data to individuals similar to participants and examining the similarity between their opinion and the obtained results. In the next stage, a narrative review was carried out, including searching through library and electronic resources as well as databases such as pub Med, Science Direct, Web of Science, Cochrane library, Scopus, Proquest, Magiran, Embase, and SID Database to access the present knowledge in the area of cares and home-care needs of mothers with pre-eclampsia; moreover, guidelines and studies containing home-care since 2005, in both English and Persian, and with the words of home-care and mothers with pre-eclampsia were reviewed and thematically analyzed. By using and combining the findings obtained from the qualitative study as well as literature review, the draft of home-care program was developed based on the needs and barriers of mothers with pre-eclampsia.

Then, the appropriateness of each care process in home-care

program was evaluated by the modified two-stage Delphi technique with a 5-point Likert scale. In the first round, scoring of each care was done individually by the relevant experts (12). Inappropriate cares were eliminated from the list of cares and the cares evaluated as appropriate were included in the final format of home-care program. The uncertain cares were introduced in the second round of Delphi to achieve expert consensus; they were discussed in person and necessary modifications were done. At last, home-care program for mothers with pre-eclampsia was developed in two parts accordance with needs, beliefs, and culture of the Iranian society.

Findings

In the first stage (qualitative study), 28 participants including 17 pregnant mothers, 8 service providers, and 5 maternal health policymakers and experts took part in the research; they were purposively selected and included in the study (Table 1,2).

Table 1: The characteristics of pregnant mothers with pre-eclampsia and description of individual characteristics of the service providers and policymakers participated in the interview

Participant code	Age	Educational level	Job	Gestational age	Pre-eclampsia severity	History of hospitalization	No. of pregnancies
P10	32	Diploma	Housekeeper	34	Mild	Yes	1
P11	40	Diploma	Housekeeper	32	Mild	No	2
P14	39	Diploma	Housekeeper	32	Mild	Yes	2
P15	39	Diploma	Housekeeper	30	Severe	Yes	2
P16	28	Bachelor's degree	Clerk	31	Mild	No	1
P18	33	Diploma	Housekeeper	Three days after term delivery	Severe	No	2
P19	35	Associate’s degree	Clerk	Two days after term delivery	Mild	No	2
P22	30	Diploma	Housekeeper	Four days after term delivery	Severe	Yes	1
P23	29	Junior high school	Housekeeper	28	Mild	No	3
P25	32	Bachelor's degree	Housekeeper	35	Severe	No	1
P26	34	Bachelor's degree	Housekeeper	34	Mild	Yes	1

Table 2: Description of individual characteristics of the service providers and policymakers participated in the interview

Participant code	Education	Job	Work experience (year)
P27	Master of Midwifery	Head of midwifery in the deputy of treatment	21
P6	Bachelor of Midwifery	Head of the hospital maternity ward	18
P7	Bachelor of Midwifery	A clerk in the midwifery ward of the hospital	12
P5	Master of Midwifery	Supervisor and in charge of communication with high-risk mothers in the hospital	22
P21	Master of Midwifery	Expert in maternal health in the deputy of health	29
P4	Master of Midwifery	Matron of specialized obstetrics and gynecology hospital	20
P24	Bachelor of Midwifery	Midwife in comprehensive health center	10
P28	Bachelor of Midwifery	Midwife in comprehensive health center	21
P8	Bachelor of Midwifery	Working in midwifery clinic of the hospital	23
P9	Master of Midwifery	Hospital training supervisor and MCMC mediator	22
P12	Reproductive Health Specialist	A member of the faculty of nursing and midwifery	19
P13	Subspecialty of Perinatology	Perinatologist and a faculty member	10
P1	Master of Midwifery	Master of midwifery and a faculty member	30
P2	Bachelor of Midwifery	Head of midwifery emergency	18
P3	Bachelor of Midwifery	Head of midwifery ward	21
P20	Bachelor of Midwifery	Midwife in comprehensive health center	23
P17	Perinatologist	A faculty member	15

Data analysis in the first stage of the research led to the formation of 12 subcategories and 4 main categories including psychological needs, supportive needs, and educational needs (Table 3).

Table 3: Main categories and subcategories obtained from analysis of participants' description of home-care needs of mothers with pre-eclampsia

Subcategories	**Minor categories**	**Main categories**
Increased stress with pre-eclampsiaMaternal concern about premature birth due to preeclampsia	Psychological consequences due to pre-eclampsia and the probable complications	**Psychological needs**
Anxiety and worry of mothers with pre-eclampsia followed by hospital caresMothers' fear of hospitalization	Psychological consequences due to hospitalization	

The desire of mothers to have the companionship of their spouses when receiving care and childbirthThe need for support in caring for other children and their routine duties	Support from family and husband	**Supportive needs**
Need to receive professional empathy and support from staffWillingness to have constant access to providers to answer questions and ensure fetal health	Support from health caregivers and pregnancy care providers	
Inadequate education of pregnant women about pre-eclampsia and its careInsufficient information of the pregnant mother about how to take care of herself	Strengthen the awareness of the mother with pre-eclampsia about the disease, its complications and care	**Educational needs**
Lack of family awareness about pre-eclampsia and its complications and how to care for the pregnant mother Lack of family cooperation in caring for a pregnant mother with pre-eclampsia	The need to train the family about pre-eclampsia and its care	

The findings of the qualitative phase as well as the literature review were combined and the draft of home-care program was designed. Then, using two rounds of Delphi technique (RAM), cares were evaluated and the home-care program for mothers with pre-eclampsia was developed in two parts. The comprehensive home-care program was developed in two parts in which the first part included the structure of the program and the second part consisted of the relevant processes.

In this home-care program, all trainings and cares are carried out with a team including gynecologist, midwife, reproductive health specialist, psychologist, and nutrition counseling that in addition to having professional skills, they have received necessary training in the field of home-care.

First part: in the introduction, the mention was made of achieving the Millennium Development Goals and reducing the mortality of mothers due to high-risk pregnancies such as those with pre-eclampsia; pre-eclampsia is highly prevalent among pregnant women in developing countries and is an important cause of mortality and complications of delivery. Severe and non-severe pre-eclampsia with outpatient or inpatient follow-up and improper management in current care in the health system causes complications due to this disease. Hence, the World Health Organization (WHO) emphasizes risk assessment strategy, screening and timely clinical management of pre-eclampsia in pregnant women (especially in developing countries). As such, In this regard, despite the implementation of programs of the Department of Maternal Health of the Ministry of Health and Medical Education, such as the design and implementation of integrated maternal care protocols, hospital protocol of midwifery services, maternity-friendly hospitals, maternal mortality, sensitization of maternal mortality services and training people regarding childbirth should be continuous care of mothers before childbirth during pregnancy, which can be an effective way to improve access to services, improve the quality of services, continuous care and timely referral of pregnant women to reduce the complications of these pregnancies.

Regarding the components of the program structure, the program perspective was presented. In this part, we will be able to achieve the desired mortality rate for pregnant women and mothers rescued from pregnancy complications and are among the leading countries in the region that provide home care services for pregnant women. The home-care program for mothers with high-risk pregnancy should be combined with Iranian maternal health system as a complement to the maternal health program.

The objective of this specific program is to have a strategic view based on the analysis of beneficiaries and clients (organizations providing services to pregnant women with pre-eclampsia, specialized physicians, midwives, etc.) and to provide a reliable, quality and safe service, it seeks to draw the attention of managers and service providers in the health sys-

tem to pay attention to the needs and problems of pregnancies with pre-eclampsia. Furthermore, this program also attempts to eliminate the existing gap with regard to the lack of a home-care protocol and a standardized and domesticized instruction for mothers with high-risk pregnancy in Iran.

In another component of this part, the values of the program were expressed in topics such as health-orientation, community-orientation, human resource management, participatory approach, patient safety, confidentiality, justice-orientation, integration, and evidence-based program.

The available capacities for providing home-care program for pregnant mothers include the existence of follow-up centers for high-risk mothers in hospitals and national guidelines, policies and protocols for providing in-hospital and out-of-hospital services to pregnant mothers and how to manage high-risk pregnancies, the existence of health system transformation plan and electronic file and the existence of SIB system and the Electronic Health Record System of Iran (SEPAS) in health centers and referral system, the existence of health houses and health centers and comprehensive health service centers, the existence of MCMC to follow high-risk mothers in the provincial deputy, the existence of local manpower required to provide health-related pregnancy services such as specialist physicians, general practitioners, midwives, family health experts, health workers in the Ministry of Health and Medical Education, the presence of health care providers in health centers, the presence of hospitals with maternity wards or maternity facilities, and the existence of midwifery counseling centers.

With regard to high-level documents, many documents can be mentioned such as research findings and the Constitution of the Islamic Republic of Iran, Clause 2 of the statement of communication policies of the Supreme Leader on the family-centered issue in support of women to strengthen the family pillar, the importance of the family in health in the third, fourth and fifth development programs of the Constitution of the Islamic Republic of Iran, general policies of the maternal health system, women's health document, comprehensive scientific map of the country's health, Clause 6 on the health system transformation service packages, statement of the Supreme Leader regarding population policies, home-care program for infants, extracted standards for postpartum home visits in maternal health office programs, outpatient care program for pregnant mothers, general policies of high-risk pregnancy service packages, strategic plan to control maternal mortality, Iranian vision document in 2025 horizon, Clause 4 of the communication policies of the Supreme Leader, statement of general health policies by the Supreme Leader regarding the health of mother and child, charter of women's rights and responsibilities in the Islamic Republic of Iran, policies and strategies to promote women's health in the Islamic Republic of Iran, current plans of the Ministry of Health and Medical Education in the Islamic Consultative Assembly, and several other documents.

The beneficiaries were divided into two groups of internal (inside the health system) and external beneficiaries (outside the health system).

The internal beneficiaries included comprehensive urban health center, provincial health deputy, (caregiver team) direct service provider team and indirect care provider team, as well as deputy director of treatment and Medical Care Monitoring Center (MCMC), the Ministry of Health and Medical Education, maternal health department of the Ministry of Health and Medical Education, and emergency (115); the external beneficiaries included pregnant women with pre-eclampsia, families of pregnant women with pre-eclampsia, contractors (service outsourcing companies), medical system organization, insurance organizations, other charities and non-governmental organizations (NGOs), Imam Khomeini Relief Foundation, Welfare Organization and other organizations such as disciplinary forces, municipality, the media, as well as midwifery services counseling centers, midwives' offices, home-care centers and private institutions.

In the second part of the structure of the program, the mention was made of specific goals such as developing main processes, feasibility study and provision of necessary equipment and resources, effective management of human resources, building intra- and inter-departmental coordination with key activities related to each item.

Flowchart communication network, chart of beneficiary communication network in home-care program for women with pre-eclampsia, and names of women with pre-eclampsia were entered into the comprehensive health center system through hospitals, doctors' offices, and governmental clinics (in order to better standardize and monitor the comprehensive health center and their access to the electronic file of mothers and the SIB health system). While introducing home-care, all units should obtain the consent of the mother for home-care and the families should be informed and enter the SIB system at the same time. The physician of the comprehensive health center should be obliged to follow up with the mothers within 1-2 days. The service will be provided through outsourcing of services. The contractor will apply for a contract with the comprehensive health center during meetings with officials in the units of the deputy of health and comprehensive health centers and succeed in obtaining the consent of the relevant authorities. The contractor is responsible for providing service-providing manpower, equipment and services. Moreover, he is responsible for coordination with supportive organizations (such as hospitals, Imam Khomeini Relief Foundation, NGOs, police, emergency services, etc.). In any geographical district, all activities of the contractor will be done under the supervision of the comprehensive health center or the health center of the district.

Second part: it consists of the care program in its first part the mention was made of the main components of each session of home-care program by stating care prioritization determination including taking a history and conducting clinical evaluations, training the pregnant woman and her family, as well as emotional, economic, social, and family support, as well as referral and follow-up.

In the second section of this part, the duties and roles of the beneficiaries with regard to home-care for women with pre-eclampsia were explained.

The health deputy of the province should supervise and monitor the implementation of this program. They can do their job in three areas including providing infrastructures, coordination with other organizations, and monitoring and follow up. The physician of the comprehensive health center should be responsible for executive supervision of the program. The staff of the comprehensive health center should monitor and coordinate the implementation of the program. The activities of the direct home-care providers should be monitored by the comprehensive health center. In other words, all actions and cares should be done with the permission of the comprehensive health center. The contractor is responsible for presenting services and direct coordination related to the implementation of the home-care program. In the third section, the flowchart of the comprehensive health center care process and the flowchart of the care and service process of the previous stage were depicted.

Discussion

This qualitative study was conducted for the first time in Iran and sought to present a comprehensive program for extensive home-care of mothers with pre-eclampsia. Results indicated that the health care needs of pregnant mothers with pre-eclampsia include psychological, supportive and educational needs.

Regarding the above-mentioned needs, it is made clear that mothers with pre-eclampsia are of some needs in all dimensions of health including physical, mental, and social dimensions. Furthermore, analyzing the description of participants in the study revealed that mothers with pre-eclampsia, in addition to conventional and routine pregnancy care, need home-care during pregnancy so as to fulfil their educational and supportive needs due to the unique characteristics of the kind of pregnancy.

According to the findings of the qualitative study, the educational need was one of the main needs of mothers with pre-eclampsia. The incident of pre-eclampsia during pregnancy is a threatening illness for mothers and most individuals of the society are not fully aware of it. One of the necessary training points for mothers in the present care program is training and announcement about the purposes of their home-care. With regard to educational needs, the qualitative data in the present study indicated that mothers needed to know about disease process, complications and care, and especially awareness of risk factors. The health status of two vulnerable

groups in the society (pregnant women and infants) relies on the pregnancy health. Therefore, medical and health centers should provide proper services for maintaining their health; training pregnant women is a part of these services. In other words, lack of education, insufficient knowledge and consequently improper function of mother and family can lead to problems and adverse pregnancy outcomes. According to the studies, pregnant women require the caregivers to present them the educational content consistent with the reality of their life. Moreover, their education should be provided in person, they can ask questions and receive answers in these educational meetings, and ask for more explanation [14].

The findings of the qualitative study indicated the need of mothers with pre-eclampsia to psychological supports. The pregnant mother becomes nervous by the incident and persistence of pre-eclampsia that has been caused by various factors. Besides, when high blood pressure is diagnosed during pregnancy, their care needs increase. Due to follow-up and referral to receive special care required to control pre-eclampsia such as repeated visits to health centers or hospitalization, pregnant women experience anxiety. They are afraid of the effects that the disease can have on their baby, and especially the possibility of a premature birth exacerbates their stress. Accordingly, these mothers need to be psychologically screened at the time of pre-eclampsia. Furthermore, they also need counseling and psychological support in the areas of strengthening altruistic motivations and controlling attachment to the baby during pregnancy and after childbirth.

Various studies showed that pre-eclampsia causes psychological reactions; for some women, these reactions may last for several years. In some cases, the physical problems of these mothers even originate from psychological damages [15]. In spite of the elimination of the dangerous complications due to pre-eclampsia, many women had symptoms of post-traumatic stress and depression for some time after delivery [16].

With regard to supportive needs, the analysis of qualitative data showed that women with pre-eclampsia expect more support from their husband and service providers. Any complication during pregnancy may necessitate special care for pregnant women, and with adequate and comprehensive support, prenatal care can ultimately lead to a desirable and pleasurable outcome. A husband plays a significant role in supporting his wife in prenatal care. Various studies have indicated that emotional support for pregnant women by others, especially by husband, is effective on the prevention of mental health damages during pregnancy and even after delivery [17].

Therefore, according to the results, the present care program highly stresses care, education, and counseling at home.

Limitation Study

The study included participants with a range of ages, educational levels, and severity of pre-eclampsia, the sample size was relatively small. Increasing the sample size could provide a more comprehensive understanding of the needs of pregnant mothers with pre-eclampsia.

The study focused on the needs of pregnant mothers with pre-eclampsia and did not include the perspectives of their partners or family members. Future research could consider including the perspectives of these individuals to provide a more comprehensive understanding of the social support needs of pregnant mothers with pre-eclampsia.

The study highlights the importance of home-care during pregnancy for meeting the educational and supportive needs of pregnant mothers with pre-eclampsia

Competing Interests

There are no financial relationships relevant to this article.The authors have no conflict of interest to disclose.

Ethics Approval and Consent to Participate

Ethical approval was received for this study from the Ethics Committee of the Isfahan University of Medicine Sciences (IR.MUI.REC. 1395.3.956). Written informed consent was obtained from individuals who participated in this study. All methods were performed in accordance with the relevant

guidelines and regulations by including a statement in the methods section to this effect.

Availability of Data and Materials

Data is available by the corresponding author on reasonable request

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Author's Contributions

ZR, MH Y, SK conceptualized and designed the project, and obtained research funding. ZR will be responsible for interview with participants, description and data analysis. ZR, SK, FM led analysis of the transcripts, and with developed the manuscript. ZR, SK, FM and MS performed the critical review. All authors reviewed and approved the final version.

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