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Continuity of Care Approach for High-Risk Pregnant Women: Its Impact on Family Independence in Childbirth Preparation

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Abstract

This study aims to analyze the effectiveness of high-risk pregnant women's assistance based on Continuity of Care (COC) on family independence in preparing for safe and planned childbirth. This study used the Quasi Experimental Design method, with the One Group Pretest-Posttest design, the population of all high-risk pregnant women and their families (202 people) in the Wonoayu District of Sidoarjo, the research sample was some high-risk pregnant women and their families (134 people) with a simple random sampling technique with inclusion criteria; High-risk pregnant women and their families, have a KIA book and live in the Wonoayu Sidoarjo Health Center area. Research instruments with questionnaires and KIA books. Data analysis with the Wilcoxon Signed Rank Test. Significance value p = 0.001, namely α <0.05, meaning that COC-based high-risk pregnant women's assistance is effective in increasing family independence in preparing for safe and planned childbirth. COC-based high-risk pregnant women's assistance is effective in increasing family independence in preparing for safe and planned childbirth. COC-based high-risk pregnant women's assistance is effective in increasing family independence in preparing for safe and planned childbirth.

Introduction

The Maternal Mortality Rate (MMR) in Indonesia is still a serious problem in the health sector, especially in efforts to achieve the Sustainable Development Goals (SDGs) target in 2030. Based on the 2022 Intercensal Population Survey (SUPAS), the MMR in Indonesia was recorded at 305 per 100,000 live births. This figure is still far from the global SDGs target of 70 per 100,000 live births. Most maternal deaths are caused by complications of pregnancy and childbirth, with the most common risk factors including bleeding, preeclampsia, infection, and other health disorders (Kemenkes RI).

In East Java Province, MMR has increased significantly in recent years. In 2021, MMR reached 98 per 100,000 live births, and this figure jumped to 234 per 100,000 live births in 2022 (Dinas Kesehatan Sidoarjo, 2022). Sidoarjo Regency also experienced the same increasing trend, with MMR of 53.1 per 100,000 live births in 2020 which increased to 59.69 per 100,000 live births in 2021 (Dinas Kesehatan Provinsi Jawa Timur, 2023). One of the areas with the highest MMR in Sidoarjo Regency is the Wonoayu Health Center, which recorded 4 deaths per 100,000 live births. The main causes of maternal death in this region are high-risk pregnancy complications, including anemia, preeclampsia, and circulatory disorders (Puskesmas Wonoayu, 2023).

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High-risk pregnancy is a condition that requires more intensive monitoring and intervention. Based on data from the Wonoayu Health Center, the prevalence of high-risk pregnancy reached 44.44%, with the main risk factors including maternal age over 35 years, birth spacing of less than 24 months, anemia, and history of cesarean section. Although the coverage of antenatal visits (K1 and K4) at the Wonoayu Health Center has reached 100%, there are still challenges in early detection and effective management of high-risk pregnancies. The low High-Risk Detection by the Community (DRTM), which only reached 9.5% of the target of 20%, indicates the need to increase community participation in detecting pregnancy risks. Continuity of Care (COC), which focuses on continuity of information, management, and relationships between health workers and pregnant women, has been globally recognized as one of the effective approaches to reducing MMR. This model ensures that pregnant women receive consistent monitoring from the same health worker throughout pregnancy until delivery, allowing for early detection of complications and faster intervention (Homer, 2016). However, the implementation of COC in Indonesia, especially in rural contexts such as at the Wonoayu Health Center, is still not optimal.

Therefore, this study aims to evaluate the effectiveness of high-risk pregnant women's assistance based on Continuity of Care (COC) on family independence in preparing for childbirth. Family independence, especially in preparing for the childbirth process and facing pregnancy risks, is a key factor in supporting the success of maternal health interventions. Through COC-based assistance, it is expected to improve family readiness in facing pregnancy complications, while also contributing to efforts to reduce maternal mortality in Indonesia, especially in areas with high high-risk pregnancy rates.

Methods

Design This study used the Quasi Experimental Design method, with the One Group Pretest-Posttest design. *Sample and setting* the population of all high-risk pregnant women and their families (202 people) in the Wonoayu District of Sidoarjo, the research sample was some high-risk pregnant women and their families (134 people) with a simple random sampling technique with inclusion criteria; High-risk pregnant women and their families, have a KIA book and live in the Wonoayu Sidoarjo Health Center area. Research instruments with questionnaires and KIA books.

Variable

The independent variable in this study is the assistance of high-risk pregnant women based on Continuity of Care (COC). The dependent variable in this study is family independence in preparing for childbirth.

Instruments

Questionnaires and KIA books

Intervention

Continuity of Care (COC) based high-risk pregnant women assistance.

Data collection

Data collection in this study was carried out through several methods, namely questionnaires, structured interviews, and direct observation. Data were collected from pregnant women who were identified as having high-risk pregnancies at the Wonoayu Health Center, Sidoarjo. Data collection was carried out in two stages, namely: 1. Pre-test Stage: Baseline data were collected before the Continuity of Care (COC) intervention began. At this stage, a questionnaire was given to pregnant women to measure the level of family independence in preparing for childbirth, such as knowledge of pregnancy danger signs, ability to plan childbirth, and family involvement in decision making 2. Post-test Stage: After the COC intervention is complete, the

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data is collected again to evaluate changes in the previously measured variables. Observation in the Maternal and Child Health Book was carried out to monitor the application of COC assistance, including the involvement of health workers and families in monitoring the health of pregnant women. Data collection also includes secondary data in the form of medical records of pregnant women from the Wonoayu Health Center, which is used to identify high -risk pregnancy based on medical criteria (maternal age, marriage distance with first pregnancy, height, weight, pregnancy distance, number of children and pregnancy history). Simple random sampling technique is used in the selection of research samples, where high-risk pregnant women who meet the inclusion criteria are chosen randomly.

Data analysis

Data is abnormal distributed so that it uses a data analysis test with Wilcoxon Signed Rank Test which aims to test the comparative hypothesis of two paired samples when the data scale is in the form of ordinal. Bivariate analysis is carried out by the Wilcoxon test using SPSS with a significant level $\alpha = 0.05$ with the following results interpretation: 1) If P-value $\leq \alpha$ then there is a significant effect between the two variables; 2) If P-value> α then there is no significant effect between the two variables.

Ethical consideration

Ethics Committee Poltekkes Kemenkes Surabaya No. EA/2689/KEPK-Poltekkes_Sby /V/2024.

Result and Discussion

Table 1. Respondent's Characteristics Frequency Distribution

Characteristics	Frequency (n)	Percentage (%)
Gestational age		
Trimester 1	78	58,21
Trimester 2	40	29,90
Trimester 3	16	11,94
Age		
< 20 Year	15	11,19
Year	99	73,88
>35 Year	20	14,93
Marriage distance by pregnancy	120	90,00
< 4 Year	14	10,00
≥ 4 Year		
Height		
< 145 cm	53	39,55
≥ 145 cm	81	60,45
weight		
< 45 Kg	28	20,90
≥ 45 Kg	106	79,10
Pregnancy distance		
≤ 2 Year	63	47,01
3-9 Year	67	50,00
≥ 10 Year	4	02,99
number of children	130	97,01
< 4	4	02,99
≥ 4		

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Pregnancy history		
Normal	99	73,88
abnormal	35	26,12

Based on Table 1 shows that most of the respondent's gestational age is trimester 1 of 58.21%, respondents are mostly aged 20-35 years at 73.88%, while the distance between respondents' marriages with the first pregnancy is most <4 years by 90%, height The respondent's body is mostly ≥ 145 cm by 60.45%, respondent's body weight is mostly ≥ 45 kg of 79.10%, respondent's pregnancy distance is mostly 3-9 years by 50%, the number of respondents' children mostly <4 children at 97 , 01%, and a history of pregnancy is most of the norms of 73.88%.

Table 2. Assistance of high -risk pregnant women based on Continuity of Care (COC)

Characteristics	Frequency (n)	Percentage (%)
Frequency of visits		
According to the visit schedule	100	74,63
Not according to the visit schedule	34	25,37
Long visit		
< 30 minute	82	61,19
30-60 minute	49	36,57
60-90 minute	3	2,24
90 minute	0	0
quality of service		
Very good	93	69,40
Good	25	18,66
Pretty good	10	7,46
Not good	5	3,73
Very bad	1	0,75
Availability of educational materials		
Available	45	33,58
Quite available	63	47,01
Less available	24	17,91
Not available	02	1,49
Satisfaction Level		
Satisfied	39	29,10
Quite Satisfied	95	70.90
Less Satisfied	0	0
Not Satisfied	0	0

Based on table 2, it shows that most of the visits are on schedule of 74.63%, the length of the visit is mostly less than 30 minutes at 61.19%, the service quality is mostly very good at 68.89%and the availability of educational materials is mostly available enough amounting to 47.01% and the level of satisfaction is mostly satisfied amounting to 70.90%

Table 3. The effectiveness of family independence in pregnant women is high risk before and after COC -based assistance

	N		Mean		Std Deviation		
	Before	After	Before	After	Before	After	P Value
Meeting physiological and psychological needs	134	134	17,45	36,42	2,63	5,51	0,001

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Childbirth preparation	134	134	11,40	24,38	2,41	3,51	0,001

Based on table 3, the significance value of P = 0.001 is α <0.05, meaning that the assistance of high-risk pregnant women based on COC is effective in increasing family independence in meeting physiological and psychological needs and childbirth preparation

Respondent characteristics

Based on Table 1, the majority of respondents were in the first trimester of pregnancy, which was 58.21%. The first trimester is a very important period in fetal development and determines the continuation of the pregnancy. In this phase, the mother's body experiences significant changes both physically and hormonally, so it requires more intensive attention and assistance. The mother's condition in this trimester greatly affects the overall health of the pregnancy, where the potential for miscarriage and fetal development problems is at the highest level (Tri Yullianna, etal., 2023). With the majority of respondents in this early trimester, COC-based assistance can provide earlier intervention to reduce the risk of complications.

Furthermore, this study also found that 73.88% of respondents were in the age range of 20-35 years, which is the ideal reproductive age for women. This age is known to have a lower risk of pregnancy complications compared to pregnancy in adolescence (<20 years) or old age (>35 years), where the risk of preeclampsia, gestational diabetes, and premature birth is higher (Anggarini Parwatiningsih et al., 2023). Therefore, the majority of respondents are in a relatively safe age group and this supports a more effective health intervention process.

Another relevant factor is the interval between marriage and first pregnancy which was found to be less than 4 years in 90% of respondents. This short interval between marriages may reflect social expectations in certain cultures that emphasize the importance of having children soon after marriage. This may also affect the psychological and physical readiness of mothers to undergo pregnancy (Setianingsih et al., 2021). On the other hand, the interval between children, which is mostly in the range of 3-9 years (50%) indicates better family planning. A sufficiently long interval between pregnancies allows the mother's body to recover from the previous pregnancy, thereby reducing the risk of complications associated with repeated pregnancies in too close a time frame (Barokah et al., 2022).

The majority of respondents also had a height of ≥ 145 cm (60.45%) and a weight of ≥ 45 kg (79.10%). These height and weight factors are important because mothers with lower height and less than ideal weight have a higher risk of difficult deliveries, including premature births and complications during childbirth (Amelia & Marcel, 2023). With the majority of respondents having sufficient height and weight, this can make a positive contribution to the mother's physical readiness to face childbirth. In addition, the number of children owned by most respondents was less than 4 children (97.01%), which indicates that the majority of mothers have experience in managing pregnancy, but still in relatively small numbers, so that reproductive health risks are still within safe limits.

Service Quality and Respondent Satisfaction

Based on the findings in Tables 2 and 3, most respondents made visits according to the predetermined schedule, which was 74.63%. Compliance with the antenatal visit schedule is very important in monitoring fetal development and the health condition of pregnant women. Routine visits allow health workers to identify problems that may arise during pregnancy and provide timely interventions (O'Connell et al., 2021). This regular frequency of visits indicates that most pregnant women have fairly good access to health services, which is important in supporting the COC-based assistance model.

However, the duration of the visit was mostly less than 30 minutes (61.19%). This short duration of the visit can be interpreted as time efficiency in health services, but on the other hand it is also necessary to examine whether the short time is sufficient to provide

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comprehensive information, education, and examinations to pregnant women (Kildea et al., 2018). However, the quality of service which was assessed as very good by 68.89% of respondents showed that in a relatively short time, health workers were able to provide quality services, including in terms of communication, medical examinations, and providing relevant education for pregnant women (Cummins et al., 2018). The availability of sufficient educational materials of 47.01% is also important to note. Adequate education related to pregnancy health and childbirth preparation is one of the important elements in increasing family knowledge and independence in preparing for childbirth (Kostania, 2020). Although the percentage of the availability of educational materials is not too high, it still has a positive impact on the level of knowledge of pregnant women. Education about danger signs of pregnancy, the importance of childbirth planning, and information on how to reduce the risk of complications can increase the mental and physical readiness of mothers in facing the childbirth process (Yanti et al., 2015).

The level of satisfaction of respondents which was mostly met (70.90%) indicated that pregnant women felt that the services provided had met their expectations. This level of satisfaction is very important because it reflects the success of the health service program in meeting the needs of pregnant women and their families. Satisfaction with health services is closely related to the effectiveness of health intervention programs, especially in the context of Continuity of Care which requires a long-term relationship between patients and health service providers (Tierney et al., 2024). With a high level of satisfaction, it is hoped that pregnant women will be more obedient and consistent in following the assistance program until delivery (Putri, 2022).

Effectiveness of the Continuity of Care (COC) Model

Overall, this study shows that the Continuity of Care (COC)-based mentoring model has a positive impact on high-risk pregnant women. The success of the COC model in this study can be seen from several indicators, such as compliance with the antenatal visit schedule, the quality of services that are considered very good, and the high level of respondent satisfaction. COC provides a sustainable and integrated approach in assisting pregnant women, with a focus on prevention, early detection, and more effective management of pregnancy risks. With a consistent mentoring model, pregnant women not only receive quality health services, but also the education and emotional support needed to better prepare for childbirth (Lee et al., 2021). This study is in line with other studies showing that COC can reduce the risk of pregnancy complications, increase patient satisfaction, and improve maternal and infant health outcomes. In the context of Indonesia, where maternal mortality rates are still high, the implementation of the COC model can be an effective solution in overcoming various challenges faced by high-risk pregnant women, such as limited access to quality health services and low knowledge about birth planning (Sibley et al., 2014).

Conclusion

Continuity of Care-based high-risk pregnant women assistance implemented at Wonoayu Health Center showed positive results in increasing family independence in preparing for childbirth. Factors such as gestational age, maternal age, compliance with visits, and quality of service all contributed to the success of this program. The COC model is able to provide ongoing assistance, which can ultimately reduce the risk of pregnancy and increase the readiness of mothers and families in facing childbirth.

Declaration of Interest

The authors declare that there is no potential conflict of interest related to this research. This research was conducted independently without any influence or involvement from parties with commercial, political, or personal interests. All data used in this research were processed with high transparency and scientific integrity. The authors also ensure that this research was

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conducted in accordance with applicable research ethics and there was no element of plagiarism or data manipulation involved. All resources and funding used came from legitimate sources and did not influence the results or conclusions of this research.

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Data Availability

The data used in this study are available and can be accessed upon request. The authors are willing to provide raw data, analysis results, and documentation related to this study to other interested researchers, on the condition that the use of the data must be in accordance with applicable research ethics and is used only for academic purposes. For further data requests, please contact the authors through the contact listed.

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