Effectiveness of E Health Birth Preparedness and Complication Readiness (BPCR) on Birth Preparedness and Complication Readiness for Maternal and Neonatal

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Abstract. Addressing the endeavor to diminish maternal and neonatal mortality (0-28 days) is crucial, given that the rates of maternal and infant mortality have not yet met the targets set by the Sustainable Development Goals (SDGs). This study seeks to assess the efficacy of the E-Health Birth Planning and Complication Prevention Program (BPCR) in enhancing both delivery readiness and maternal complication preparedness. The research employs a simple random sampling technique to select participants, with the study conducted in the city of Semarang, specifically in the operational area of the Kedungmundu Health Center. In the year 2022, this study was undertaken. The research employed a quasi-experimental design, incorporating pre and post-tests with a control group design for neonatal mothers in each group, selected through a simple random sampling technique. Data analysis involved the utilization of the Wilcoxon test and Mann Whitney test to evaluate the effectiveness of the E-Health Program for Birth Planning and Complication Prevention (BPCR) in enhancing delivery preparedness and maternal complication preparedness, making comparisons between the control and treatment groups. Following the implementation of the intervention, the results of the difference test indicated a significant post-test distinction between the control group and the treatment group ($p = 0.000 < 0.05$). The p-value obtained from the paired T-test within the control group was 0.563, which is greater than p (0.05). Therefore, it was concluded that there was no significant difference before and after the intervention in the control group. Conversely, in the treatment group, the p-value was $0.000 < p$ (0.05), leading to the conclusion that there were notable differences before and after the intervention in the treatment group when analyzing the effectiveness of the E-Health Birth Preparation and Complication Readiness (BPCR) on childbirth readiness and complication preparation.

Keywords: E Health, BPCR, Preparedness.

1.   Introduction

The objectives of effective antenatal care are to support and maintain mothers and babies' physical, mental, and social well-being through education on health, nutrition, personal hygiene, and the birth process [1]. Pregnancy-related medical, surgical, or obstetric complications are also included, as is the detection of anomalies or complications and their management. Additionally, pregnancy care helps women become ready for childbirth and for any complications that may arise. It also helps moms nurse their babies successfully, recover normally from giving birth, and take care of their children socially, psychologically, and physically. If necessary, pregnancy care also helps prepare referrals [2].

It is hoped that pregnant women will not facing complications during pregnancy because if pregnant women facing complications during pregnancy, it will endanger the lives of both the mother and the fetus.

2.   Content

2.1.   Preparation for Childbirth and complications

Midwives in the community facilitate the preparation for childbirth and pregnancy complications, aiming to enhance the active involvement of husbands in this process [3], Families and communities are engaged in the strategic planning of secure childbirths, along with preparations for potential complications in pregnant women, encompassing considerations for postpartum contraceptive measures. [4] Utilizing sticker media as a means of notifying targets is employed to enhance the quality of health services for mothers and newborns. [5].

2.2.   Birth Preparedness and Complication Readiness (BPCR)

The implementation of Birth Preparedness and Complication Readiness (BPCR) is part of the government's initiatives to decrease the Maternal Mortality Rate (MMR) in Indonesia. [6]. The P4K initiative is conducted by village midwives to enhance the proactive involvement of husbands, families, and communities in organizing secure childbirths and preparing for potential complications during pregnancy. [7].

2.3.   E- Health Birth Preparedness and Complication Readiness (BPCR)

The E-Health application for the Birth Preparedness and Complication Readiness (BPCR) contains a guide to the notes [8] from the Birth Preparedness and Complication Readiness (BPCR) that pregnant women can do [9]. Birth Preparedness and Complication Readiness (BPCR) notes in this application include: Estimation of Birth, Birth Assistance, Place of Birth, Transportation, and Prospective Blood Donors [10].

The use of the E-Health application for Birth Preparedness and Complication Readiness (BPCR) involves inputting data such as information on pregnant women and the details of Birth Preparedness and Complication Readiness (BPCR) [11]. Subsequently, a conclusion will be generated based on the findings derived from the Birth Preparedness and Complication Readiness (BPCR) records obtained through the inputted data [12].

The novelty of the E-Health application for Birth Preparedness and Complication Readiness (BPCR) lies in its Birth Mandate feature. This feature involves an agreement indicating the readiness of pregnant women, along with their husbands and/or families, regarding the various components of BPCR. [13]. In addition, the midwife in charge of the area can access BPCR data for pregnant women in the E-Health application for the Birth Preparedness and Complication Readiness (BPCR) so that they can monitor delivery planning and prevent complications for pregnant women in their area [14].

Fig 1. Login

Fig 2. Input Pregnant Women

Fig 3. BPCR   **Fig 4**. Birth Mandate

3.   Research Methods

3.1.   Methods

The research design is Quasi-Experimental, involving a comparison between the treatment group and the conventional group. Both groups will undergo skills assessment both before and after the intervention, following a pretest-posttest control group design[15]. The instrument used to measure skills is the skills questionnaire.

3.2.   Sample design

The minimum number of samples obtained is 30 people in each group.

3.3.   Data collection

The researchers invited participants to be part of the study and subsequently divided them into a treatment group and a control group. The initial phase involved conducting a pre-test to assess awareness levels. The final step comprised a post-test to evaluate the impact of utilizing E-Health on enhancing Birth Preparedness and Complication Readiness.

4.   Data Analysis

4.1.   Characteristics of Research Subjects

Characteristics of subjects to determine the equality between the control and treatment group as follow:

Table 1. Characteristics of Research Subjects (Age)

| Characteristics | Group | | | |
| | Control | | Treatment | |
	N= 30	%	N= 30	%
Age (year)				
20 – 25	7	23,3	7	23,3
>25 – 30	7	23,3	10	33,3
>30 – 35	16	53,3	13	43,3
Number of children				
1	13	43,3	11	36,7
>1	17	56,7	19	63,3
Education				
Junior High School	4	13,3	5	16,7
Senior High School	10	33,3	6	20
Bachelor	10	33,3	9	30
Post Graduate	6	20	10	33,3
Ocupation				
Work	16	53,3	18	60
Unwork	14	46,7	12	40
Income				
< EP	16	53,3	15	50
≥ EP	14	46,7	15	50

Based on the table above, the frequency distribution is in the control and treatment groups. The characteristics based on age in the control group were mostly aged > 30 - 35 years as many as 13 people (43.3%). Characteristics based on the number of children in the control group were >1 person, 17 respondents (56.7%), and in the treatment group, the majority of children were >1 person, 19 respondents (63.3%). The majority of the last education in the control group was high school and bachelor's degree, namely 10 respondents (33.3%) and the majority in the treatment group had a master's degree/doctoral degree, 10 people (33.3%). Most of the employment in the control group and treatment group were 16 people (53.3%) and 18 people (60%). Frequency distribution was based on the income of the control group, most of them had income < minimum wage, 16 people (53.3%), and the treatment group had income of 15 people < minimum wage and 15 people ≥ EP.

4.2. Frequency Distribution Birth Preparedness and Complication Readiness (BPCR)

Table 2. Frequency Distribution Birth Preparedness and Complication Readiness (BPCR)

| Birth Preparedness and Complication Readiness (BPCR) | Group | | | |
| | Control | | Control | |
	N= 30	N= 30	N= 30	N= 30
Pre Test				
Good	7	23,3	11	36,7
Less	23	76,7	19	63,3
Post test				
Good	8	26,7	20	66,7
Less	22	73,3	10	33,3

Based on the table above, the analysis of the effectiveness of e-health Birth Preparedness and Complication Readiness (BPCR) on readiness and childbirth and complications preparedness was mostly in the treatment group before being given treatment. The effectiveness of e-health Birth Preparedness and Complication Readiness (BPCR) with good readiness and delivery and complications preparedness was eight people (26.7%) after 20 people (66.7%) were given treatment for the effectiveness of e-health Birth Preparedness and Complication Readiness (BPCR) with good readiness for delivery and complications preparedness. This means there is an increase in the effectiveness of e-health Birth Preparedness and Complication Readiness (BPCR) on childbirth readiness and complications preparedness before and after treatment.

4.3. Analysis of the Effectiveness of E-Health Birth Preparedness and Complication Readiness (BPCR) on Birth Preparedness and Complication Readiness for Maternal and Neonatal

Table 3. Analysis of the Effectiveness of E-Health Birth Preparedness and Complication Readiness (BPCR) on Birth Preparedness and Complication Readiness for Maternal and Neonatal

| Birth Preparedness and Complication Readiness for Maternal and Neonatal | Group | | Nilai p* |
	Control	Treatment	
Pre Test			0,622[a]
Mean (SD)	44,39 (12,95)	45,92 (13,92)	
Post Test			0,000[a]
Mean (SD)	42,91 (10,11)	69,15 (11,77)	
Nilai p*	**0,563[b]**	**0,000[b]**	

The results in the table above show that the control group has a p-level value of 0.622 > 0.05, meaning that there is no pre-test difference between the control group and the treatment group in terms of childbirth readiness and complication preparedness. After the intervention was carried out, the results of the difference test showed that there was a post-test difference between the control group and the treatment group (p = 0.000 < 0.05). The p-value obtained in testing using the paired T-test in the control group was 0.563 > p (0.05), so it was concluded that there was no difference before and after in the control group, while in the treatment group it was known that the p-value was 0.000 < p (0.05) then it can be concluded that there are differences before and after in the treatment group in the analysis of the effectiveness of e-health Birth Preparation and Complication Readiness (BPCR) on childbirth readiness and complication preparation.

Authors' Contributions

Implementation of this application in midwifery services is enabled by heightened awareness of mothers about e-health emergencies for neonates. The purpose of the E-Health Birth Preparedness and Complication Readiness (BPCR) application is to improve preparedness for childbirth and possible complications.

Acknowledgments

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