

# Implementation of Birth Preparedness and Complication Readiness (BPCR) in High Risk Pregnancies

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## ABSTRACT

**Introduction:** Birth Preparedness and Complication Readiness (BPCR) is the Indonesia government program aimed at reducing the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR). The program requires the active participation of pregnant women and their families, as well as the community. Health cadres are recruited from the community to help pregnant women and their families in monitoring their health status and recognising the early signs of pregnancy complications. Therefore, this study aimed to examine the effect of the factors related to the health cadre's perception and BPCR implementation in high risk pregnancies.

**Method:** The study employed an observational analysis with a cross sectional approach. 126 health cadres in Surabaya, Indonesia, were recruited as the study subjects. The data collection was carried out through interviews and observations using a structured questionnaire. The data analysis was conducted using univariate, bivariate and multivariate analysis.

**Results:** Based on the health cadre's perception, the implementation of BPCR was moderately satisfactory (52.4%). Most of respondents had a moderate understanding of the standard procedure and policy targets (48.4%). Most of the respondents selected moderate when rating the resource's availability (72.2%), interpersonal communication (85.7%), technical support (58.7%) and the attitude of the BPCR implementer (92.1%). From the path analysis, the BPCR implementation was significantly affected by the understanding of the standard procedures and policy targets, the technical support from the public health centres, the interpersonal/organisational communication, the attitude of the implementers, and the availability of resources.

**Conclusions:** The public health centre should provide a clear standard procedure and effectively communicate the BPCR program to the health cadres, pregnant women and their families, as well as to the community.

**Keywords:** *birth preparedness and complication readiness, health cadre, high risk pregnancy*

## INTRODUCTION

Worldwide, about 20% of pregnancies have the risk of complications.<sup>1</sup> Similarly, the Indonesia Ministry of Health also estimated that approximately 15% of pregnancies in Indonesia have maternal complications ranging from mild to high severity level.<sup>2</sup> Since 1991, the Maternal mortality

rate (MMR) in Indonesia has decreased from 390 per 100,000 live births to 228 per 100,000 live births in 2007, but then made another increase to 359 per 100,000 live births in 2012.<sup>3</sup> East Java is among the provinces in Indonesia with the highest MMR.<sup>4</sup> Most of the maternal deaths in East Java were caused by eclampsia (31%), bleeding (25%), heart disease (12%), infection (6%) and for other reasons (26%).<sup>5</sup>

Most maternal deaths are preventable.<sup>6</sup> To reduce maternal mortality, the Indonesia Ministry of Health (MoH) launched the Birth Preparedness and Complication Readiness (BPCR) program. This program aims to improve awareness on the risk of pregnancy complications and was designed for pregnant

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women and their families, health cadres, and health care workers.<sup>7</sup> Using the BPCR sticker, every pregnant woman is monitored for their health status. The health care worker also provides health counseling and makes a childbirth plan with the expectant mother, their family and the community to improve both maternal and infant health.<sup>7</sup> The involvement of the family, especially the husband in the maternal health program, significantly influenced the increased use of antenatal care.<sup>8</sup>

Through BPCR, health care workers can detect a high risk pregnancy complication early and suggest a safe childbirth plan to prevent poor maternal and newborn outcomes.<sup>9</sup> The BPCR strategy has been adopted in various developing countries. Previous studies in Ethiopia, Nigeria, and Nepal have highlighted some factors influencing the success of BPCR implementation.<sup>10-12</sup> Place of living, distance to a health facility, level of education, level of income, knowledge of pregnancy complication signs, employment, attitude and number of antenatal care visits were among factors associated with the implementation of BPCR.<sup>12-14</sup> In relation to the BPCR implementation in Indonesia, our study was conducted in order to analyse the factors influencing the BPCR in association with high risk pregnancies in Surabaya, Indonesia.

**METHOD**

This study employed an observational design with a cross sectional approach. The study population was drawn from health cadres in Wonokromo and Sawahan sub-districts in Surabaya, Indonesia. The recruitment of the study subjects was conducted through stratified proportional random sampling. 126 health cadres were invited to participate. The independent variables selected for this study were based on issues collected during the initial survey of BPCR program implementers in Surabaya, including the interpersonal communication between public health centres and the community-based health initiative, resource availability, technical support and training, the attitude of the BPCR implementers, and the understanding of the standard procedures and policy targets. The dependent variable was the implementation of BPCR among women with high-risk pregnancies.

The data was collected using a structured questionnaire and observation sheet. The structured questionnaire used close-ended questions, each with five scales ranging from very poor to excellent, while the observation sheet included a checklist sheet to measure the resource variables of facilities and infrastructure. The

data analysis was carried out using univariate, bivariate and multivariate analyses. The association between the independent and dependent variables was tested using the Chi Square correlation test. Path analysis was performed to assess the effect of the independent variables on the implementation of BPCR.

**RESULTS**

As shown in Table 1, most of the respondents had a moderate understanding of the standard procedure and policy targets (48.4%). Most of the respondents selected moderate when rating the resource availability (72.2%), interpersonal communication (85.7%), technical support (58.7%), the attitude of the BPCR implementer (92.1%) and BPCR implementation (52.4%).

**Table 1: The frequency distribution of the variables of the respondents' perception on the factors influencing BPCR**

| Variables   | Scale     | Frequency | Percent (%) |
|---|-----------|-----------|-------------|
| Understanding the standard procedure and policy targets | Very poor | 0         | 0           |
|   | Poor      | 11        | 8.7         |
|   | Moderate  | 61        | 48.4        |
|   | Good      | 54        | 42.9        |
|   | Excellent | 0         | 0           |
|   | Total     | 126       | 100.0       |
| Resource availability                                   | Very poor | 0         | 0           |
|   | Poor      | 35        | 27.8        |
|   | Moderate  | 91        | 72.2        |
|   | Good      | 0         | 0           |
|   | Excellent | 0         | 0           |
|   | Total     | 126       | 100.0       |
| Interpersonal/organisational communication              | Very poor | 5         | 4.0         |
|   | Poor      | 5         | 4.0         |
|   | Moderate  | 108       | 85.7        |
|   | Good      | 8         | 6.3         |
|   | Excellent | 0         | 0           |
|   | Total     | 126       | 100.0       |
| Technical support                                       | Very poor | 5         | 4.0         |
|   | Poor      | 47        | 37.3        |
|   | Moderate  | 74        | 58.7        |
|   | Good      | 0         | 0           |
|   | Excellent | 0         | 0           |
|   | Total     | 126       | 100.0       |

Conted...

|                                   |           |     |       |
|-----------------------------------|-----------|-----|-------|
| Attitude of the BPCR implementers | Very poor | 0   | 0     |
|                                   | Poor      | 10  | 7.9   |
|                                   | Moderate  | 116 | 92.1  |
|                                   | Good      | 0   | 0     |
|                                   | Excellent | 0   | 0     |
|                                   | Total     | 126 | 100.0 |
| BPCR implementation               | Very poor | 8   | 6.3   |
|                                   | Poor      | 2   | 1.6   |
|                                   | Moderate  | 66  | 52.4  |
|                                   | Good      | 50  | 39.7  |
|                                   | Excellent | 0   | 0     |
|                                   | Total     | 126 | 100.0 |

A bivariate analysis was performed to assess the correlation between the independent variables and the

dependent variables (table is not shown). An understanding of the standard procedure and policy targets was not associated with BPCR implementation ( $p\text{-value}=0.529 > \alpha=0.05$ ). The availability of resources was associated with BPCR implementation ( $p\text{-value} = 0.046 < \alpha = 0.05$ ). Interpersonal/organisational communication was associated with BPCR implementation ( $p\text{-value}= 0.000 < \alpha = 0.05$ ). Technical support was not associated with BPCR implementation ( $p\text{-value}=0.263 > \alpha = 0.05$ ). The attitude of the BPCR implementer was associated with BPCR implementation ( $p\text{-value}= 0.000 < \alpha = 0.05$ ).

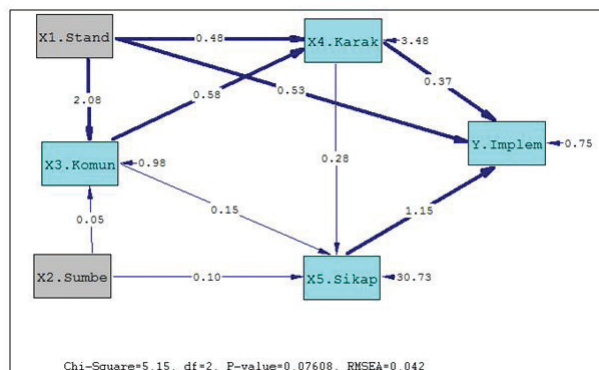
The pathway model of the BPCR implementation was employed to assess the effect of each direction of the relationship. Several goodness of fit tests were conducted, and the results suggested that the model fit the data, as presented in Table 2.

**Table 2: Results of the Goodness of Fit tests**

| Goodness of fit test                            | Index criteria  | Value obtained    | Remark    |
|---|---|-------------------|-----------|
| Chi Square ( $X^2$ )                            | Count value $X^2 < \text{table value } X^2_{(5\%;1)}$ | 5,15 < 5,99       | Model fit |
| Significance Probability                        | $\geq 0,05$   | 0,076 $\geq$ 0,05 | Model fit |
| Root Mean Square Error of Approximation (RMSEA) | $\leq 0,05$   | 0,042 $\leq$ 0,05 | Model fit |
| The goodness of fit index (GFI)                 | $\geq 0,90$   | 0,987 $\geq$ 0,90 | Model fit |
| The adjusted goodness of fit index (AGFI)       | $\geq 0,90$   | 0,910 $\geq$ 0,90 | Model fit |
| Confirmatory Fit Index (CFI)                    | $\geq 0,90$   | 0,982 $\geq$ 0,90 | Model fit |

The path diagram described the BPCR implementation in Figure 1, regarding implementation. BPCR implementation (Y) had a direct influence on the technical support of the public health centre (X4.support), the attitude of the BPCR implementers (X5.attitude), and had an indirect influence on the understanding of the standard procedures and policy targets (X1.standard), resource availability (X2.resource), and interpersonal/organisational communication (X3.communication). As seen in Figure 1, there are four pathways with significant relationships (as shown by the thick lines), including 1) X1.Standard  $\rightarrow$  X4.support  $\rightarrow$  Y; 2) X1.Standard  $\rightarrow$  Y. Implementation; 3) X1.Standard  $\rightarrow$  X3.Communication  $\rightarrow$  X4.support  $\rightarrow$  Y. Implementation; 4) X5.attitude  $\rightarrow$  Y. The pathway from X1.standard to Y had a total effect value of 3.93 and was unidirectional. The pathway from X2.resource to Y had a total effect value of 0.14 and was unidirectional. The pathway from X3.communication to Y had the total effect value of 0.57 and was unidirectional. The pathway from X4.support to Y had a total effect

value of 1.84 and was unidirectional. The pathway from X5.attitude to Y had a total effect value of 1.15 and was unidirectional.



**Figure 1: The pathway diagram of the effect value (pathway coefficient)**

**DISCUSSION**

Our results showed that some of the factors describing the cadre’s perception on understanding the standard

procedures and policy targets, the technical support from the public health centre, the interpersonal/organisational communication, the attitude of BPCR implementers and the resource availability was significant in relation to BPCR implementation.

In this study, the interpersonal/organisational communication and the attitude of the BPCR implementers improved BPCR's implementation. According to Azwar (2010), communication in program implementation is crucial, as the extent of the communication received would influence the implementer in decision-making and in creating a conducive working atmosphere.<sup>15</sup> Effective communication is the first step for successful policy implementation.<sup>16</sup> A previous study also suggested that the program policies should be clearly communicated and socialised to the health cadres as the front-line staff, so then they can understand and actively help monitor women with high risk pregnancies.<sup>17</sup> Having a poor understanding of the program could demotivate the program implementer in relation to good performance.<sup>18</sup> Implementers that shown a good attitude would result in good performance, in relation to the program implementation.<sup>19</sup>

Communication is also influential to form the attitude of the implementers, as shown in their enthusiasm related to carrying out the needed tasks. Therefore, communication is not just an information delivery activity, but also an attempt to influence and strengthen the target's perceptions and attitude as desired. Good communication will increase the participation of pregnant women, increasing the early detection of a high risk to the pregnancy and preparing for a safe delivery.<sup>20</sup>

To improve BPCR implementation, the health cadres require good technical support from the public health centre, as shown in the study results. This support can be in the form of formal or non-formal support. Formal support can be obtained from regular supervision via the public health centre, while informal support can be obtained from the daily interaction between the cadres and the village midwives.<sup>7</sup> Supervision from a technical advisor would improve the implementation performance, as the technical advisor would have the opportunity to do a direct observation while the implementer would have a chance to provide a face to face consultation.<sup>15</sup> Clear standard procedures and policy targets are a strong stimulus for successful policy implementation, leading

to the acceptance and willingness of the implementer to carry out the program.<sup>21</sup>

The resource availability in terms of health workforce and financial support is significant in relation to BPCR implementation in this study. The health workforce is central in implementing the health care program. Therefore, the availability, accessibility, acceptability, and affordability of the health workforce is crucial in promoting the success of the program.<sup>22</sup> Sufficient and competent human resources, funds and the infrastructure facilities that are used optimally can facilitate the implementation process.<sup>11</sup> Resources such the workforce, finances, facilities, and infrastructure must be made available and sustainable in order to generate the expected outcome.<sup>16</sup> This issue has been well-recognized by the Government of Indonesia who continuously strengthen the health workforce system at all levels with other sectors.<sup>23</sup>

BPCR implementation involves activities that require the active participation of husbands, families and cadres (community) in planning safe deliveries and understanding the danger signs of pregnancy complications.<sup>24</sup> In Indonesia, the husband's participation as an alert husband or *Suami Siaga* in the safe motherhood program has improved antenatal care attendance and planning for delivery in a health facility.<sup>8</sup>

## CONCLUSION

Based on the perception of health cadres on BPCR implementation, several factors including understanding the standard procedures and policy targets, the resource availability, the interpersonal/organisational communication, the technical support from the public health centre, and the attitude of the BPCR implementer has a significant effect on the success of BPCR implementation. The public health centre has a central role in providing and delivering clear procedure and policy targets within and for the BPCR program. Building effective communication between the health cadres and health workers in the public health centre, including the village midwives, can improve the attitude of the program implementers which leads to improved BPCR implementation. However, optimum BPCR implementation is impossible to achieve without sufficient resource availability, especially in relation to the health workforce and financial support.



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