

Research Article

Using the Theory of Planned Behavior to Explain Expecting Couples Birth Preparedness Intentions in a Rural Setting: A Cross-Sectional Study from Rukwa, Southern Tanzania

Fabiola V. Moshi ¹, Stephen M. Kibusi ¹, and Flora Fabian²

¹School of Nursing and Public Health, The University of Dodoma, P.O. Box 259, Dodoma, Tanzania

²School of Medicine and Dentistry, The University of Dodoma, P.O. Box 259, Dodoma, Tanzania

Correspondence should be addressed to Fabiola V. Moshi; fabiola.moshi@gmail.com

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Background. According to the Theory of Planned Behavior, an intention to carry out a certain behavior facilitates action. In the context of planning for birth, certain preparations and planning may better ensure maternal and neonatal survival. Little is known on the predictors of birth preparedness intention among expecting couples. The aim of this study was to determine the predictors of birth preparedness intentions among expecting couples. **Methods.** A community based cross-sectional study targeting pregnant women and their partners was performed from June until October 2017. A three-stage probability sampling technique was employed to obtain a sample of 546 couples. A structured questionnaire based upon the *Theory of Planned Behavior* was used. The questionnaire explored three main domains of birth preparedness intentions. These three domains included (1) attitudes towards birth preparedness, (2) perceived subjective norms towards birth preparedness, and (3) perceived behavior control towards birth preparedness. **Results.** The vast majority of study participants had birth preparedness intentions. This included 521 (95.4%) pregnant women and 543 (99.5%) of their male partners. After adjusting for the confounders, the predictors of birth preparedness intentions among pregnant women were attitude (AOR=70.134, 95% CI=12.536-392.360, $p<0.001$) and perceived behavior control (AOR=7.327, 95% CI=1.545-34.761, $p<0.05$) which were significant. Among male partners, only attitudes (AOR=31.315, 95% CI=1.497-655.149, $p<0.05$) influenced the birth preparedness intention. **Conclusion.** Birth preparedness intention among male partners was higher compared to their female partners. The reason for the difference could be the concern each group puts on the issue of birth preparedness. Among the three domains of intention, attitude and perceived behavior control were statistically significant predictors of birth preparedness intention among pregnant women. Attitude was the only domain which influenced birth preparedness intention among male partners. Therefore, interventional studies are recommended targeting attitudes and perceived behavior control in order to boost birth preparedness intention.

1. Introduction

Globally, maternal mortality has declined by 45% per year since 1990 [1]. The estimated number of maternal mortality was 289,000 in 2013 worldwide [1]. Sub-Saharan Africa accommodated the largest share of the maternal mortality as 179,000 maternal deaths occurred in this region in 2013 [1].

Tanzania is among the countries in Sub-Saharan region committed to reduce maternal mortalities by increasing the use of facility deliveries and quality of childbirth care [2] but maternal mortality remains unacceptably high. According to 2010 and 2015 Demographic and Health Survey, maternal

mortality was 454 [3] and 556 [4] per 100,000 live births, respectively.

Despite the fact that improving access to skilled attendants during child birth and emergency obstetric care are vital strategies towards reduction of maternal and neonatal mortalities, the use of skilled attendants during childbirth is unacceptably low in developing countries [5]. Forty million births in this region were not attended by skilled health personnel, but by traditional birth attendants or relatives in 2012, and over 32 million of those births occurred in rural areas [5]. Despite the fact that the use of skilled birth attendants in developing countries was 68% in 2012, the use of

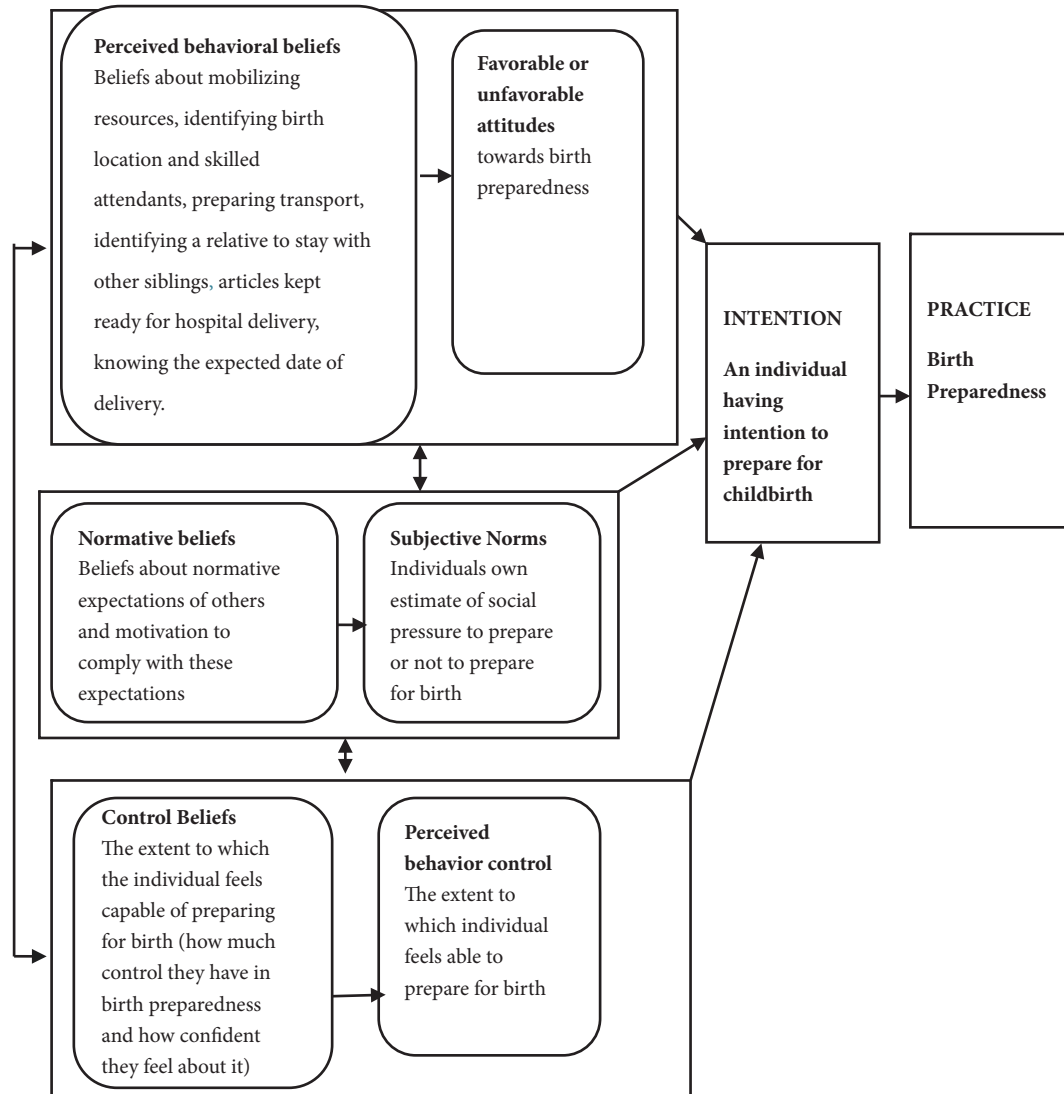


FIGURE 1: Theoretical framework of birth preparedness based on the Theory of Planned Behavior.

skilled birth attendants in Sub-Saharan Africa was only 53% [5] while only 51% used skilled birth attendants in Tanzania [3].

As previously demonstrated in the literature, a main cause of low utilization of maternal health services is low levels of birth preparedness [6]. Birth preparedness has a potential to reduce all three phases of delays to access maternal services. These delays include delay in decision-making to seek healthcare, delay in reaching a health facility, and delay in obtaining appropriate care upon reaching a health facility [7].

Studies have reported low-birth preparedness in developing countries, especially in South Asia and Sub-Saharan Africa [6, 8–11]. A study conducted in Tanzania reported that only 0.8% of expecting mothers identified skilled birth attendants, 10.2% identified transport, and 47.2% saved money for emergency [12]. Similar studies conducted in Nigeria and Uganda also reported low levels of birth preparedness [10, 11].

According to the *Theory of Planned Behavior*, an individual will have the intention to perform a behavior when they evaluate it positively, believe that the important others think they should perform it, and perceive it to be within their own control [13]. The intention to prepare for childbirth is influenced by the way an individual evaluates birth preparedness. If they evaluate it positively, believing that important others think it is something worth doing and perceive they can do it then they will have the intention to prepare.

An attitude toward a behavior refers to the degree to which a person has positive or negative feelings of the behavior of interest. It entails a consideration of the outcomes of performing the behavior [13]. A subjective norm refers to the belief about whether important others think he or she will perform the behavior. It relates to a person's perception of the social environment surrounding the behavior [13]. Perceived behavior control refers to the individual's perception of the extent to which performance of the behavior is easy or difficult [13] (see Figure 1).

There is a close link between preparation for childbirth and use of health facilities for childbirth [14]. Previous studies have reported several factors which influence birth preparedness. A few key factors include maternal level of education, male involvement in birth preparedness, living in either an urban or rural setting, and walking distance to the health facility [15–17].

The social, family, and community contexts and beliefs do influence preparation for childbirth either positively or negatively [18]. The attitude of expecting couples, their understanding of the social pressure to prepare for childbirth, and whether they feel able to prepare for childbirth all contribute to their intention to prepare for childbirth. Increasing core knowledge about the components of birth preparedness is key strategy to ensure that birth preparedness intention translates into the actual practice of preparing for birth. As such, the aim of this study was to use the *Theory of Planned Behavior* to explain birth preparedness intention among expecting couples in the rural setting of Rukwa Region Tanzania.

2. Methods

2.1. Study Design and Setting. A community based cross-sectional study was conducted in Rukwa Region from June 1st to October 30th, 2017, among expecting couples from forty-five villages in Rukwa Region in the Southern Highlands of Tanzania. The region had a population of 1,004,539 people: 487,311 males and 517,228 females. The forecast for 2014 was 1,076,087 persons with a growth rate of 3.5%. The region has the lowest mean age at marriage where males marry at the age of 23.3 years and 19.9 years for females and fertility rate of 7.3 [19].

2.2. Sampling Method and Sample Size

2.2.1. Sampling Technique. Two districts (Sumbawanga Rural District and Kalambo District) were conveniently selected from the four districts of Rukwa Region. Three-staged multistage cluster sampling technique was used to obtain study participants. During first-stage random samplings, all wards (12 wards of Sumbawanga Rural District and 17 wards of Kalambo District) in each district were listed and by the use of the lottery method of random sampling, five wards from Sumbawanga District and ten from Kalambo District were picked. During second-stage random samplings, all villages in the selected wards were listed and another simple random sampling was conducted to select fifteen villages from Sumbawanga rural district and thirty villages from Kalambo District. The third-stage sampling was a systematic sampling used to obtain households with pregnant women of 24 weeks of gestation or less and living with a male partner. At each visited household, a female partner was interviewed for the signs and symptoms of pregnancy. A female partner who had missed her period for two months was requested to complete a pregnancy test. Those with positive tests who gave consent to participate were enrolled in the study. If a selected household had no eligible participants, the household was skipped and researchers entered into the next household.

2.2.2. Sample Size Calculation. The sample size for couples who were involved in the study was calculated using the following formula [20]:

$$n = \frac{\{Z\alpha\sqrt{[\pi_0(1-\pi_0)]} + 2\beta\sqrt{[\pi_1(1-\pi_1)]}\}^2}{(\pi_1 - \pi_0)^2} \quad (1)$$

where

n is the maximum sample size,

$Z\alpha$ is the standard normal deviation (1.96) at 95% confidence level for this study,

2β is the standard normal deviate (0.84) with a power of demonstrating a statistically significant difference before and after the intervention between the two groups at 90%,

π_0 is the proportion at preintervention (use of skilled delivery in Rukwa Region 30.1%) [3],

π_1 is the proportion after intervention (proportion of families which would access skilled birth attendant 51%) [3],

$$n = \frac{\{1.96\sqrt{[0.301(1-0.301)]} + 0.84\sqrt{[0.51(1-0.51)]}\}^2}{(0.6-0.51)^2} \quad (2)$$

$$n = 162 \text{ couples} + 10\% = 180$$

Therefore, the required sample size in the intervention group is 180 couples.

Intervention: control ratio is 1:2. Therefore sample size in the control group is 360 couples.

2.3. Data Collection Procedure. Data was collected using self-administered questionnaires. Four trained research assistants (two from each district) were recruited, trained, and participated in data collection. Questionnaires on testing birth preparedness intention were developed using a Theory of Planned Behavior. The questionnaire had two parts: (i) the social demographic characteristics and (ii) a Likert scale where respondents were supposed to strongly agree, agree, neutral, strongly disagree, and disagree. There were three subparts of the statements in the Likert scale which were (i) attitudes towards birth preparedness, (ii) perceived subjective norms towards birth preparedness, and (iii) perceived behavior control towards birth preparedness.

2.4. Data Processing and Analysis. The data was checked for completeness and consistencies, then it was coded and entered into computer using statistical package IBM SPSS version 23. Descriptive statistics were used to generate frequency distribution and cross tabulation was used to describe the characteristic of the study participants. Logistic regression was done to determine the predictors of intention to prepare for childbirth.

2.5. Ethical Consideration. The proposal was approved by Ethical Review Committee of the University of Dodoma. A letter of permission was obtained from the Rukwa Regional

TABLE I: Sociodemographic characteristics of respondents.

Character	Male (n ₁ , %) (n ₁ =546)	Female (n ₂ , %) (n ₂ =546)	Total (n ₁ +n ₂) 1092	p-value
Age (years)				
Less than 20	27 (4.9)	167 (30.6)	194 (17.8)	
21 to 25	143 (26.2)	156 (28.6)	299 (27.4)	
26 to 30	146 (26.7)	105 (19.2)	251 (23.0)	* * *
31 to 35	87 (15.9)	55 (10.1)	142 (13.0)	
36 and above	143 (26.2)	63 (11.5)	206 (18.9)	
Age at Marriage (years)				
Less than 18	71 (13.0)	395 (72.3)	466 (42.7)	
19 to 24	353 (64.7)	147(26.9)	500 (45.8)	* * *
25 and above	122 (22.3)	4 (0.7)	126(11.5)	
Ethnic group				
Fipa	367 (67.2)	322 (59.0)	689(63.1)	* * *
Mambwe	118 (21.6)	120 (22.0)	238 (21.8)	
Others	61 (11.2)	104 (19.0)	165 (15.1)	
Marital status				
Cohabit	154 (28.2)	156 (28.6)	310 (28.4)	
Married	392 (71.8)	390 (71.4)	782 (71.6)	
Number of wives				
Monogamous	467 (85.5)	469 (85.9)	936 (85.7)	
Polygamous	79 (14.5)	77 (14.1)	156 (14.3)	
Education level				
Non-formal	155 (28.4)	230 (42.1)	385 (35.3)	
Primary School	353 (64.7)	299 (54.8)	652 (59.7)	* * *
Secondary school or Higher	38 (7.0)	17 (3.1)	55 (5.0)	
Income per day				
Less than 1 dollar	382 (70.0)	399 (73.1)	781 (71.5)	
More than 1 dollar	164 (30.0)	147 (26.9)	311 (28.5)	
Own radio				
Yes	308 (56.4)	253 (46.3)	561 (51.4)	* * *
No	238 (43.6)	293 (53.7)	531 (48.6)	
Own mobile phone				
Yes	234 (42.9)	69 (12.6)	303 (27.7)	* * *
No	312 (57.1)	477 (87.4)	789 (72.3)	
Family members				
2	76 (13.9)	76 (13.9)	152 (13.9)	
3 to 5	250 (45.8)	249 (45.6)	499 (45.7)	
6 or more	220 (40.3)	221 (40.5)	441 (40.4)	
Adult female in the family				
None	315 (57.7)	318 (58.2)	633 (58.0)	
1 or more	231 (42.3)	228 (41.8)	459 (42.0)	
Covered by Health Insurance				
Yes	170 (31.1)	177 (32.4)	347 (31.8)	
No	376 (68.9)	369 (67.6)	745 (68.2)	
Health facility				
Dispensary	452 (82.8)	452 (82.8)	904 (82.8)	
Health centre	94 (17.2)	94 (17.2)	188 (17.2)	
Approximately distance to reach to the health facility (Km)				
Less than 1	259 (47.4)	258 (47.3)	517 (47.3)	
1 to 5	232 (42.5)	233 (42.7)	465 (42.6)	
More than 5	55 (10.1)	55 (10.1)	110 (10.1)	

Here, * * * indicates $p < 0.001$.

TABLE 2: Frequency distribution table on attitudes, perceived subjective norms, perceived behavior control towards birth preparedness, and birth preparedness intention among expecting couples.

Variables	Pregnant women		Their partners	
	n	%	n	%
Attitude				
Positive attitude	537	98.4	528	96.7
Negative attitude	9	1.6	18	3.3
Subjective norms				
Positive subjective norms	495	90.7	526	96.3
Negative subjective norms	51	9.3	20	3.7
Perceived behavior control				
Positive behavior control	532	97.4	521	95.4
Negative behavior control	14	2.6	25	4.6
Intention to prepare for childbirth				
No	25	4.6	3	0.5
Yes	521	95.4	543	99.5

Administration. Both written and verbal consent were sought from study participants after explaining the study objectives and procedures. Their right to refuse to participate in the study at any time was assured.

3. Results

3.1. Sociodemographic Characteristics. A total of 546 couples were included in the study, with a response rate of 100%. The sample included 546 pregnant women (with gestational age of 24 weeks and below) and their partners. The mean age among the pregnant women was 25.57 years (sd=6.810) and the mean age of their partners was 30.65 years (sd=7.726). The majority of the couples were married (390, 71.4%), were monogamous (469, 85.9%), live on less than 1 dollar per day (382, 70.0%), and receive their basic obstetric care services from dispensaries (452, 82.8). Ninety-five percent of the cohort had completed primary school or less (Table 1).

Overall, the majority of study participants had the intention to prepare for childbirth. This included 521 (95.4%) pregnant women and their partners 543 (99.5%). Similarly, 537 (98.4%) pregnant women and 528 (96.7%) of their partners had positive attitudes towards birth preparedness. On perceived subjective norms, 495 (90.7%) pregnant women and 526 (96.3%) of their partners had positive perceived subjective norms about birth preparedness. Positive perceived behavior control was also present among 532 (97.4%) of pregnant women and 521 (95.4%) of their partners (see Table 2).

Among pregnant women, attitude ($p<0.001$), perceived subjective norms ($p<0.01$), perceived behavior control ($p<0.001$), ethnic group ($p<0.05$), ever heard about birth preparedness ($p<0.001$), economic status ($p<0.05$), and owning a mobile phone ($p<0.05$) had statistically significant relationship to birth preparedness intention. Among male partners only attitude ($p<0.01$), perceived subjective norms ($p<0.01$), and owning a mobile phone ($p<0.05$) had statistically significant relationship with birth preparedness intention (see Table 3).

After adjusting for the confounders (other variables which showed significant relationship with intention to prepare) among pregnant women, the model contained three components of Theory of Planned Behavior (attitude, subjective norms, and perceived behavior control). The full model containing all predictors was statistically significant ($X^2(3, N=546)=41.481$ $p<0.001$) (see Table 4). The mode as a whole explained between 7.3% (Cox and Snell R square) and 23.6% (Nagelkerke R squared) of the variable birth preparedness intentions. The strongest predictor of birth preparedness intention was attitude towards birth preparedness. Respondents who had positive attitudes were 70.134 times more likely to have birth preparedness intention than those with negative attitudes towards birth preparedness. Another component of Theory of Planned Behavior which showed statistical significance was a perceived behavior control. Pregnant women who felt they have ability to prepare for childbirth were 7 times more likely to have birth preparedness intention than those who felt they were not capable.

Among male partners, the full model containing all predictors was statistically significant ($X^2(3, N=546)=8.548$ $p<0.05$). The mode as a whole explained between 1.6% (Cox and Snell R square) and 23.6% (Nagelkerke R squared) of the variable birth preparedness intention. As shown in Table 5, attitudes towards birth preparedness intention made a significant contribution to the model. Male partners who had positive attitudes are 31.315 more likely to have birth preparedness intention than male partners with negative attitudes. Both subjective norms and perceived behavior control did not show statistical significant impact to birth preparedness intention.

4. Discussion

According to the *Theory of Planned Behavior*, birth preparedness intention is influenced by the attitude the individual has about birth preparedness, the perceived subjective norms this particular individual has, and the perceived control on performing the behavior [13]. In this study, the behavior of

TABLE 3: Distribution of participants by birth preparedness intention and the potential factors affecting birth preparedness intention (Chi-Square).

Variable	Intention to prepare Pregnant women (N=546)			Intention to prepare Their partners (N=546)		
	Yes n(%)	No n(%)	p-value	Yes n(%)	No n(%)	p-value
Attitude						
Positive attitude	519(96.65)	18(3.35)	0	526(99.62)	2(0.38)	0.003
Negative attitude	2(22.22)	7(77.78)		17(94.44)	1(5.56)	
Subjective norms						
Positive subjective norms	476 (96.16)	19(3.84)	0.01	524(99.62)	2(0.38)	0.006
Negative subjective norms	45(88.24)	6(11.76)		19(95.00)	1(5.00)	
Perceived behavior control						
Positive behavior control	512(96.24)	20(3.76)	0	518(99.42)	3(0.58)	0.704
Negative behavior control	9(64.29)	5(35.71)		25(100)	0(0.0)	
Age groups						
Less than 20	159(95.21)	8(4.79)	0.799	26(96.30)	1(3.70)	0.064
21 to 25	150(96.15)	6(3.85)		141(98.60)	2(1.40)	
26 to 30	98(93.33)	7(6.67)		146(100)	0(0.0)	
31 to 35	53(96.36)	2(3.64)		87(100)	0(0.0)	
36+	61(96.83)	2(3.17)		143(100)	0(0.0)	
Ethnic group						
Fipa	302(93.79)	20(6.21)	0.051	364(99.18)	3(0.82)	0.479
Mambwe	119(99.17)	1(0.83)		118(100)	0(0.0)	
Others	100(96.15)	4(3.85)		61(100)	0(0.0)	
Education Level						
No Formal	216(93.91)	14(6.09)	0.277	154(99.35)	1(0.65)	0.174
Primary School	288(96.32)	11(3.68)		352(99.72)	1(0.28)	
Secondary School or Higher	17(100)	0(0.0)		37(97.37)	1(2.63)	
Ever heard about birth preparedness						
Yes	441(97.57)	11(2.43)	0	442(99.55)	2(0.45)	0.514
No	80(85.11)	14(14.89)		101(99.02)	1(0.98)	
Economic status						
Less than one dollar/dollar	376(94.24)	23(5.76)	0.029	381(99.74)	1(0.26)	0.165
At least one dollar/day	145(98.64)	2(1.36)		162(98.78)	2(1.22)	
Own a mobile phone						
Yes	69(100)	0(0.0)	0.052	231(98.72)	3(1.28)	0.045
No	452(94.76)	25(5.24)		312(100)	0(0.0)	
Knowledge of birth preparedness components						
Not knowledgeable	482(95.26)	24(4.74)	0.514	511(99.42)	3(0.58)	0.665
Knowledgeable	39(97.5)	1(2.5)		32(100)	0(0.0)	
Parity						
Para 0	112(93.33)	8(6.67)	0.374			
Para 1-4	306(95.62)	14(4.38)				

TABLE 3: Continued.

Variable	Intention to prepare Pregnant women (N=546)			Intention to prepare Their partners (N=546)		
	Yes n(%)	No n(%)	p-value	Yes n(%)	No n(%)	p-value
Para 5+	103(97.17)	3(2.83)				
Have a prior pre-term delivery			0.765			
Yes	28(96.55)	1(3.45)				
No	493(95.36)	24(4.64)				
Prior C Session			0.424			
Yes	13(100)	0(0.0)				
No	508(95.31)	25(4.69)				

TABLE 4: The logistic regression predicting the likelihood of components of Theory of Planned Behavior to influence birth preparedness intention among pregnant women.

Variables	B	S.E	Wald	df	p	Odds Ratio	Lower	Upper
Attitude	4.250	.878	23.410	1	.000	70.134	12.536	392.360
Subjective norms	.291	.699	.174	1	.677	1.338	.340	5.269
Perceived behavior control	1.992	.794	6.286	1	.012	7.327	1.545	34.761

TABLE 5: The logistic regression predicting the likelihood of components of Theory of Planned Behavior to influence birth preparedness intention among male partners.

Variables	B	S.E	Wald	df	p	Odds Ratio	Lower	Upper
Attitude	3.444	1.551	4.928	1	.026	31.315	1.497	655.149
Subjective norms	2.842	1.538	3.416	1	.065	17.153	.842	349.308
Perceived behavior control	-20.437	6815.8	.000	1	.998	.000	.000	.

interest was birth preparedness. We found that the majority of study participants had birth preparedness intention (99.5% among male partner and 95.4% among pregnant women). The birth preparedness among male partners was found to be higher than their female partners. The reason for the difference could be due to the concern the two groups put on the issue of birth preparedness. Pregnant women being the one going through pregnancy and childbirth may put big weight on the issue of birth preparedness to an extent of feeling unable to prepare for childbirth.

Using the Theory of Planned Behavior framework, this study identified that attitude influenced birth preparedness intention among both pregnant women and their partners. This finding is in line with findings from previous study which reported attitude predicting intention to the choice of method of delivery [21].

The study also found that perceived behavior control significantly influenced birth preparedness intention among pregnant women. Pregnant women who felt they had ability to prepare for childbirth are more likely to had birth preparedness intention compared to those who felt they do not have ability to prepare for childbirth. Similar findings was reported in a previous study by Bahareh et al. [21]. Perceived behavior control was not a significant factor among male respondents.

Subjective norms were not a significant predictor of birth preparedness intention among both pregnant women and their partners. The finding is in line with a previous study by Kalolo and Kibusi [22] and contrary to a study done by Bahreh et al. [21]. The possible reason for the difference could be the study respondents in this study who were from similar environment sharing similar norms.

Maternal and neonatal mortality rates in Rukwa Region remain high, reinforcing the tremendous vulnerability of both women and babies at the time of birth [19]. Using the three-delay model as a framework, it is clear that health system strengthening is needed to reduce delays at each juncture. A key strategy for improving health outcomes includes strengthening community demand and mobilization. One wonders about the potential positive impact that deeper preparation of both men and women might have on both intention and action in this setting. The findings from this study recommend innovative interventions which will boost attitudes towards birth preparedness and perceived behavior control.

This study is not without limitations. The key information gathered from the study participants was self-reported which is subject to under- or overreporting. Attitudes can be difficult to ascertain. Despite the systematic data collection approach, there may have been some intrinsic bias in the questionnaire

or manner in which questions were asked that affected the responses.

5. Conclusion

Birth preparedness intention among male partners was higher compared to their female partners. The reason for the difference could be the concern each group puts on the issue of birth preparedness. Among the three domains of intention, attitude and perceived behavior control were statistically significant predictors of birth preparedness intention among pregnant women. Attitude was the only domain which influenced birth preparedness intention among male partners. Therefore, interventional studies are recommended targeting attitudes and perceived behavior control in order to boost birth preparedness intention.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Additional Points

Limitation. This study may have its limitation that the study population is much older than the stated regional age of pregnancy which could have affected the reported findings.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

Fabiola Moshi led the conception, design, acquisition of data, analysis, interpretation of data, and drafting of the manuscript. Stephen Kibusi and Flora Phabian guided the conception, design, acquisition of data, analysis, interpretation, and critical revising of the manuscript for intellectual content and have given final approval for the version to be published. All authors read and approved the final manuscript.

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