Factors associated with husband's involvement in birth preparedness and complication readiness in urban slums of Mangaluru, India: a cross-sectional community-based study

Siddharudha Shivalli[1], Ramya Murugesh[2], Soujanya Kaup[3], and Anusha Narayanswamy[3]

[1]London School of Hygiene & Tropical Medicine
[2]Yenepoya Medical College, Yenepoya (Deemed to be) University, Mangaluru, Karnataka, India
[3]Yenepoya Medical College, Yenepoya (Deemed to be) University

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Abstract

Objective: To assess the level of husband's involvement in and the key factors associated with birth preparedness and complication readiness (BPCR) in urban slums of Mangaluru, Karnataka, India Design: Cross-sectional community-based study Setting: 21 urban slums in Mangaluru, India Population: Resident men in 21 urban slums (whose wife had childbirth/s within one year) selected by multi-stage random sampling. Methods: We interviewed eligible husbands using a semi-structured questionnaire to collect data on socio-demography, wife's obstetric and antenatal care (ANC) details, and husband's involvement in six key BPCR practices. Main Outcome Measure: Husband's optimal BPCR involvement (i.e. followed minimum four of six practices). Results: Of the 214 eligible husbands, 207 participated (96.7%-response rate) and 50.2% (95%CI:43.3-57.2) displayed optimal BPCR involvement. 98.6% of wives had [?]4 ANC visits, and 91.8% of husbands escorted wives for ANC at least once. Literate wife (AdjOR:6.5; 95%CI:1.4-28.9), ANC in first trimester (AdjOR:7.8; 95%CI:1.01-61.1), and receiving adequate advice on BPCR (AdjOR:47.8; 95%CI:10.4-219.8) were associated with husband's optimal BPCR involvement. Conclusions: Only half of the husbands showed optimal BPCR involvement, and it was associated with wife's literacy, ANC in first trimester, and receiving adequate BPCR information. Although nine of 10 husbands escorted their wives for ANC at least once, only about one-fourth of them received adequate information on BPCR, emphasising missed opportunities for health education during ANC. Grassroots health workers should engage husbands during ANC and explain various BPCR practices. Further qualitative research may help develop socio-culturally contextualised strategies to enhance the husband's role in BPCR.

Introduction

Birth preparedness and complication readiness (BPCR) is a programmatic approach to enhance the use and effectiveness of key maternal and newborn health services. Preparing women (and family) for birth and being ready for complications reduces 3-phase delays (decision to seek, reach and obtain care) in receiving services and hence, reduces mortality. Multilevel stakeholders (women, families, communities, providers, and policymakers) need to engage in BPCR as diverse factors contribute to three delays . A meta-analysis reported that BPCR interventions, with minimum 30% population coverage, significantly reduce maternal (53%) and neonatal mortalities (24%) in low-resource settings.

With 17% of the world's population, India holds the key to global progress on sustainable development goals (SDG 2030). Since 2005 (launch of National Rural Health Mission, NRHM), India has made significant progress in reducing maternal (from 254-122/100,000 live births) and neonatal (from 38-23/1000 live births) mortalities. Various NRHM strategic initiatives and flagship programs (increased access to essential maternal health services, promoting institutional deliveries, and subsidised demand-side financing) successfully

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improved maternal and child health. Despite these improvements, India lags on SDG 2030 and national health policy-2017 goals.

To further gain on improvements by addressing regional health inequities, India launched National Urban Health Mission (NUHM) in 2013, focusing on urban population (mainly urban poor) health care needs . Under NUHM, Auxiliary Nurse Midwife (ANM), for every 10,000 population, renders essential maternal and child health services supported by a community health volunteer, ASHA (Accredited Social Health Activist). As a key component of antenatal care (ANC), BPCR is recommended for all pregnant women.

Due to the patriarchal societal norms in many developing countries, men are often the primary decision-makers and play a key role in the first two delays (decision to seek care and reach care). Many studies and meta-analyses reported that male involvement is linked to various benefits, including improved women's self-care, use of skilled care, and maternal health outcomes in developing countries. Men's involvement in which they relate to reproductive health problems, programmes, rights, and behaviour is a key intervention for improving maternal health

Several Indian studies assessed women's involvement in BPCR. Although involving men in maternal and child healthcare is not a new strategy, data on Indian men's involvement in BPCR is scarce.

Objective: To assess the level of husband's involvement in and the key factors associated with BPCR in urban slums of Mangaluru, India.

Methods

Study setting

Mangaluru is a coastal city of Dakshina Kannada district, Karnataka state in southern India. With Human and Urban Development Indices (HDI and UDI) of 0.83 and 0.69, Mangaluru is one of southern India's fastest growing non-metro economies . It has a population of about a 0.5million and an average literacy rate of 93.7%. Off late, Mangaluru witnessed labour immigration due to an enormous spurt in construction activities and rapid industrialisation, which resulted in the growth of urban slums. According to Mangaluru city corporation office data, there are 21 urban slums in Mangaluru city. Of these 21, eight are notified (recognised by the local body), and 13 are non-notified slums (not recognised by the local body). Most of them are in private lands with a total population of about 11,000.

One district hospital and ten urban primary health centres are the public health infrastructure in the city . The private health sector is the major source of healthcare and delivery in urban areas of the district and Karnataka state . According to National Family Health Survey-4, (NFHS-4, 2015-16), institution delivery rate in the district is 97.1%. However, a considerable proportion of women in the district experienced complications during their last pregnancy (53.7%), childbirth (45.6%), and the postnatal period (11.1%) .

Participants

A man residing in an urban slum of Mangaluru whose wife had childbirth/s within one year from the date of interview.

Study design and sample size

We conducted a cross-sectional community-based study from April-September 2016. Based on the study population size of approximately 460 (husbands in 21 urban slums whose wife had childbirth within one year), assuming that 50% of the husbands are involved in BPCR (an optimal prevalence to get maximum sample size), assuming a design effect of 1.5 (due to multi-stage random sampling), and an expected 90% response rate, this study required 214 eligible husbands for estimating the expected proportion with 15% precision relative to the expected proportion and 95% confidence.

Sampling : Fig 1 summarises the multi-stage random sampling method.

Selection of slums: Firstly, based on the slum size and eligibility for various health schemes, we stratified 21 urban slums as large (with [?]100 households), small (<100 households) and designated Scheduled Caste/Scheduled Tribe (SC/ST) slums. According to this stratification, there were four large, nine small and eight designated SC/ST slums. Secondly, considering the resource constraints, we selected 10 urban slums (two large, four small, and four designated SC/ST slums) by simple random sampling with proportional allocation in each category.

Selection of participants: In each of the selected slums, we obtained a list of women who delivered within one year from the *Anganwadi* centres. The *Anganwadi* centre is the Integrated Child Development Services (ICDS) scheme's basic functional unit, which provides supplementary nutrition, non-formal education, and health services to under-five children. We decided the required number of women from each slum by proportional allocation and selected by simple random sampling from the slum wise list of women. None of the randomly selected women was a widow, divorced or separated. We approached the husband of the selected woman in the slum in the afternoon or early evening to ensure their availability and better participation.

Data collection

We prepared a semi-structured questionnaire based on the six actionable points in the JHPIEGO (Johns Hopkins Program for International Education in Gynecology and Obstetrics) BPCR assessment tool . We elicited information regarding socio-demographic profile, wife's obstetric details, and primary decision-maker in the family regarding timing and place of seeking healthcare, knowledge of danger signs and BPCR practices. We validated (by two independent experts), and pilot tested (on 15 recently delivered women in the postnatal ward of a tertiary care hospital in Mangaluru) the questionnaire before the data collection.

Variables

We sought the following details: socio-demographic profile (age, religion, literacy status, working status, economic status, wife's literacy and working status, and primary decision-maker in the family regarding timing and place of seeking healthcare during pregnancy), wife's obstetric details (parity, number of ANC visits, source of ANC, awareness JSY benefits (*Janani Suraksha Yojana* , safe motherhood scheme- a conditional cash assistance scheme for a woman who delivers in an institution) , husband's knowledge of key danger signs of pregnancy (vaginal bleeding, swelling all over the body, severe anaemia, high fever, severe headache, fits, blurred vision, and bursting of water bag without labour pain), childbirth (excessive vaginal bleeding, prolonged labour pain, i.e. >12hours, fits and retained placenta) and postpartum (excessive vaginal bleeding, foul-smelling vaginal discharge and high fever), and receiving information on BPCR from an ANM/doctor.

We assessed the husband's involvement in BPCR based on the following practices: planned four ANC visits for wife, identified the place of delivery, saved money to pay for expenses, identified the mode of transport to the place of childbirth, identified a birth companion, and arranged a blood donor if the need arises.

Operational definitions

Economic status: Under the targeted public distribution system (a key public intervention to enhance food security), based on their economic status, Indian households are classified as Above and Below Poverty Line (APL and BPL) . Based on the type of ration card possessed under the targeted public distribution system, we categorised the economic status of the family as BPL and APL.

Adequate knowledge of key danger signs: if a man recalled at least two key danger signs of all the three phases, i.e., pregnancy, childbirth, and postpartum (i.e., total six danger signs).

Receiving adequate BPCR information: if a man or his wife received information on at least five out of six key practices of BPCR from an ANM/doctor.

Outcome measure : Man's involvement in BPCR was considered 'optimal' if he was involved in a minimum of four (of six) components of BPCR.

Statistical analysis

We used descriptive statistics like frequencies, proportions, and mean (standard deviation, SD) to summarise the sample characteristics. We dichotomised the outcome variable BPCR as optimal (followed at least four of the six steps of BPCR) and suboptimal (followed fewer than four steps of BPCR). Using binary logistic regression analysis, we computed the Odds and adjusted Odds ratios (OR and Adj OR) with a 95% confidence interval (95% CI). The ORs for age (continuous variable) was related to a one-year increase in age. We considered those predictor variables with $p < 0.2$ in the unadjusted analysis for adjusted analysis. A two-sided $p < 0.05$ was considered statistically significant.

Results

We approached 214 eligible husbands, and 207 participated (response rate: 96.7%). One person did not consent to participate, and the other six were not available for the interview. Husband's mean age ($\pm$SD) was 32.8 ± 5.7 years, with a 90.8% literacy rate. More than half of them (57.5%) were in the 31-40 years age group. One-fourth of the husbands (25.6%) were from SC/ST slums. Most of them followed the Hindu religion (85%), and the nuclear family system was in vogue (56%). Nearly half of them (44.9%) were from the BPL family [Table 1].

Table 2 shows the wife's obstetric and ANC parameters. Nearly three-fourths of them were multiparas. Overall, the private sector was the primary source of ANC (56%). However, the public sector was the primary source of ANC for BPL families when compared to others (60.2% vs 30.7%, $p < 0.001$). Very high proportions of women had ANC in the first trimester (93.7%) and completed the minimum required four ANCs (98.6%). Only about one-third of them had availed of the benefits of JSY. Nearly two-thirds of the husbands were aware of at least one danger sign of pregnancy, childbirth, and postpartum. Nine of every ten husbands escorted his wife for ANC at least once. Nearly one-fourth (26.1%) of them received adequate BPCR from a doctor/ANM. Only one-sixth of them were aware of free public transport services for delivery.

Following proportion of husbands involved in various components of BPCR: planned four ANC visits for wife (200, 96.6%), identified the place of delivery (174, 84.1%), identified the mode of transport (113, 54.6%), identified the birth companion (138, 66.7%), arranged a compatible blood donor (52, 25.1%), and saved money for the delivery expenses (87, 42%).

As many as 104 husbands (50.2%, 95%CI:43.3-57.2%) displayed optimal involvement in BPCR (i.e., involved in at least four components of BPCR). All, 90.8%, 75.8%, 50.2% and 10.1% of them followed at least one, two, three, four, and five of the six BPCR components, respectively. None of them followed all the six BPCR practices.

On unadjusted analysis, the following socio-demographic, wife's obstetric, and ANC factors were associated with husband's optimal BPCR involvement: occupation other than labourer (OR: 2.62, 95%CI:1.45-4.72), literate wife (OR: 3.5, 95%CI:1.3-9.1), non-poor family (OR:1.84, 95%CI:1.06-3.19), adequate knowledge of key danger signs (OR: 3.43, 95%CI:1.93-6.09), accompanied wife for ANC at least once (OR: 4.26, 95%CI:1.36-13.32) and received adequate advice on BPCR (OR: 32.1, 95%CI:9.56-107.7) [Tables 3 and 4].

Table 5 shows the adjusted analysis of all those variables with $p < 0.2$ on unadjusted analysis for independent correlates of optimal BPCR involvement. Literate wife (AdjOR:6.5; 95%CI:1.4-28.9), ANC in the first trimester (AdjOR:7.8; 95%CI:1.01-61.1) and receiving adequate information on BPCR (AdjOR:47.8; 95%CI:10.4-219.8) were associated with optimal involvement of husband in BPCR. A week of evidence showed associations of adequate knowledge of key danger signs (AdjOR:2.03; 95%CI:0.98-4.2, $p=0.057$) and ANC in the private sector (AdjOR:2.14; 95%CI:0.91-5.04, $p=0.081$) with husband's optimal BPCR involvement. For the adjusted analysis, we did not include the 'number of ANC visits by wife' ($p=0.19$ on the unadjusted analysis) as the number of wives with less than four ANC visits was too small (n=3) to make logistic regression reliable.

Discussion

Main findings

Only half of the husbands in the urban slums of Mangaluru displayed optimal BPCR involvement. Husband's BPCR involvement was more likely to be optimal if the wife was literate, had ANC visit in the first trimester, and man/wife received adequate information on BPCR.

Strengths and limitations

Findings of this community-based study on a representative sample apply to 21 urban slums in Mangaluru and other cities with similar socio-demography and health service utilisation profiles. To minimise the recall bias, we restricted husbands whose wives had childbirth/s within one year.

Findings may not apply to husbands whose wives had an abortion or stillbirths within one year as we did not study them. However, only 4.2% of the women in the district experience abortion or stillbirth in a year . Husband's involvement in BPCR in this study was self-reported, and there might be a disparity in self-reporting and actual practice.

Interpretation

The 1994 United Nations Department of Public Information International Conference on Population and Development (ICPD '94) firmly emphasised men's active inclusion and shared responsibility in maternal and reproductive health . Husband's participation in BPCR appears to be context-specific and widely varies globally. Previous studies highlighted that a husband's involvement in BPCR is influenced by factors such as man's age, literacy, socioeconomic status, ethnic background, religion, and culture. Exploring these key correlates of a husband's involvement in BPCR would be of great use in fine-tuning ongoing maternal and child health strategies.

In a recently published meta-analysis, husbands' involvement in BPCR in low- and middle-income countries (LMICs) varied from 6.6% to 86% . The pooled estimate of husband's involvement in BPCR from 37 studies (17,148 sample size) was 42.4% (95%CI: 33.0-51.8%) . It was relatively better in Asian countries (55.7%, 95% CI: 22-89.4%) when compared to sub-Saharan Africa (39.8%, 95% CI: 31.2-48.5%) . However, this systematic review did not find any study from India. Husband's involvement in our study (50.2%, 95%CI:43.3-57.2%) was similar to the pooled estimate from seven studies in Asia, i.e., Bangladesh, Indonesia, Myanmar, and Nepal . However, this comparison is not straightforward due to variations in the parameters considered to assess BPCR (husband's knowledge and behavioural practices of BPCR) and how the husband's optimal involvement in BPCR was defined. Our study focused on the husband's six key BPCR related behavioural practices and used relatively stringent criteria to define optimal involvement in BPCR (practised at least 4 of 6 practices).

In our study, the husband's BPCR involvement in the following practices was comparable with pooled estimates from 37 studies in LMICs: identified the mode of transport (54.6% vs pooled 45.8%), arranged a compatible blood donor (25.1% vs pooled 16.1%), saved money for the delivery expenses (42% vs pooled 45.7%). On the contrary, the husband's involvement in identifying the place of delivery (84.1% vs pooled 57.2%) and accompanying wife for ANC (91.8% vs pooled 45.7%) was higher in our study. Husband's dismal involvement in identifying a compatible blood donor in this study and across LMICs requires attention . Given that postpartum haemorrhage is the most common cause of maternal mortality in India and LMICs, the ready availability of a blood donor during emergency obstetric care could belief saving.

According to our and previous studies , husbands' optimal involvement in BPCR is associated with wives' literacy. This could be attributed to the overarching benefits of formal education in empowering women, enhancing their autonomy, and shared decision-making for their health. Adequate knowledge of danger signs aids in the early recognition of potentially life-threatening complications and may avert the unnecessary delay in deciding to seek health care . Although evidence was weak, our study highlighted the positive effect of knowledge of key danger signs on BPCR. Other studies have also reported an association between knowledge of key danger signs and BPCR practice.

In our study, despite very high ANC service use by women and 91.8% of husbands accompanying their wives for ANC at least once, only half of the husbands were optimally involved in BPCR. Also, optimal BPCR

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involvement seemed relatively better in husbands who sought ANC from the private sector (weak evidence). These emphasise missed opportunities for health education during ANC visits, particularly in the public health sector. During pregnancy, the couple is sensitive and receptive to suggestions. At the grassroots, ANM and ASHA should involve the husband while explaining the key danger signs and BPCR practices.

Under NUHM, ANM and ASHA play a vital role in promoting the husband's involvement in BPCR. In previous studies, health workers' efforts to engage men in maternal health have shown positive results . Running evening clinics is one of the core strategies of NUHM and has started in Mangalore in 2016 . This strategy would further boost public healthcare sector use for ANC and provide an opportunity to enhance the husband's involvement as he would be back home from work.

While designing strategies to improve the husband's involvement in BPCR, one must be sensitive to community perceptions and practices. In many cultures in developing countries, the husband is not expected to be directly involved in maternal and child health, and involvement is regarded as a sign of weakness . A man accompanying wife for ANC is unusual in many communities and often considered superfluous. In rural Tanzania, perceived traditional gender roles and husbands' lack of knowledge and opportunities for involvement in obstetric care were reported as barriers . Culture strongly influences women's access to and use of available healthcare services . Hence, considering its dynamism, culture should be incorporated into maternal healthcare services. Further qualitative research would be vital to understand community perception, drivers, and barriers to the husband's involvement in BPCR and develop socio-culturally contextualised strategies in the study setting.

Conclusion

Only half of the husbands showed optimal BPCR involvement, and it was associated with the wife's literacy, ANC in the first trimester, and receiving adequate BPCR information. Although nine of 10 husbands escorted their wives for ANC at least once, only about one-fourth of them received adequate BPCR information, emphasising missed opportunities for health education during ANC. To align with new strategies under NUHM, ANM and ASHA need to involve husbands while explaining the key danger signs and BPCR practices during ANC. Through qualitative research, understanding community perceptions and practices of the husband's involvement in BPCR would help develop socio-culturally contextualised strategies to improve the husband's role in BPCR further.

Disclosure of interests: The authors have no conflicts of interest to declare about this article. Completed disclosure of interest forms is available to view online as supporting information.

Contribution to authorship

SS conceptualised and designed the study, developed the questionnaire, analysed the data, and drafted the manuscript. RM revised the questionnaire. RM and NA collected the data and revised the manuscript. SK revised the questionnaire, provided critical inputs in interpreting the results and revised the manuscript. All the authors have read and approved this version of the manuscript.

Ethical approval

Yenepoya University Ethics Committee, Mangaluru, India, approved the study protocol (YUEC232/2016). We also obtained the necessary permission from the Deputy Director, ICDS, *Dakshina Kannada* district, to get the data from *Anganwadi* centres in the urban slums of Mangaluru. We obtained informed written consent from all the study participants for voluntary participation in the local language, *Kannada* .

publication of this article.

References

Table 1. Key socio-demographic characteristics of husbands residing in urban slums of Mangaluru, Karnataka, India, 2016

(n=207)

Characteristic	n	%
Religion		
Hindu	176	85
Islam/Christian	31	15
Type of family		
Joint	91	44.0
Nuclear	116	56.0
Education status		
Illiterate	19	9.2
Literate	188	90.8
Occupation		
Laborer	74	35.7
Others	133	64.3
Economic status		
Above poverty line	72	34.8
Below poverty line	93	44.9
No ration card	42	20.3
Type of slum		
SC/ST	53	25.6
Small	71	34.3
Large	83	40.1
Workplace		
Within city	200	96.6
Out of city	7	3.4
Wife's education		
Illiterate	24	11.6
Literate	183	88.4
Wife's occupation		
Employed	37	16.9
Unemployed	170	82.1

Table 2. Obstetric and antenatal care parameters of study participant's wife residing in urban slums of Mangalore, Karnataka, India, 2016 (n=207)

Study variable	n	%
Wife's parity		
Primipara	79	38.2
Multipara	128	71.8
Source of antenatal care		
Public health sector	91	44.0
Private health sector	116	56.0

Study variable	n	%
Antenatal care visit in first trimester		
No	13	6.3
Yes	194	93.7
Number of Antenatal care visits by wife		
Fewer than 4	3	1.4
4 or more	204	98.6
Aware of *Janani Suraksha Yojana*		
No	100	48.3
Yes	107	51.7
Availed the benefits of *Janani Suraksha Yojana*		
No	142	68.6
Yes	65	31.3
Aware of free transport for delivery		
No	173	83.6
Yes	34	16.4
Aware of key danger signs		
None	71	34.3
Minimum one danger sign	136	65.7
Minimum two danger signs	117	56.2
Decision maker in seeking health care		
Husband	107	51.7
Wife	49	23.7
Others	51	24.6
Accompanied wife for antenatal care		
Never	19	9.2
At least once	188	91.8
Adequately informed about BPCR		
No	153	73.9
Yes	54	26.1
Wife had any complication in pregnancy		
No	171	82.6
Yes	36	17.4

Table 3. Association between socio-demographic factors and husband's involvement in birth preparedness and complication readiness (BPCR) in urban slums of Mangaluru, Karnataka, India, 2016

(n=207)

Study variable	BPCR	BPCR	BPCR	BPCR	OR (95%CI)	p
	Suboptimal (n=103)	Suboptimal (n=103)	Optimal (n=104)[#]	Optimal (n=104)[#]		
	n	%	n	%		
Age*	32.9	6.13	32.7	5.2	0.99 (0.95-1.04)	0.828
Wife's age*	26.54	4.4	26.89	4.6	1.02 (0.96-1.08)	0.577
Religion						
Hindu	87	49.4	89	50.6	0.92 (0.43-1.97)	0.823
Islam/Christian	16	57.6	15	48.S	1	
Type of family						
Joint	42	46.2	49	53.8	0.77 (0.45-1.34)	0.359
Nuclear	61	52.6	55	47.4	1	
Education status						
Illiterate	11	57.9	8	42.1	1	
Literate	92	48.9	96	51.1	1.44 (0.55-3.73)	0.457
Occupation						
Laborer	48	64.9	26	35.1	1	
Others	55	41.4	78	58.6	2.62 (1.45-4.72)	**0.001**
Wife's education						
Illiterate	18	75	6	25	1	
Literate	85	46.4	98	53.6	3.5 (1.3-9.1)	**0.009**
Wife's occupation						
Employed	21	56.8	16	43.2	0.71 (0.35-1.45)	0.347
Unemployed	82	48.2	88	51.8	1	
Economic status/Ration card						
Above poverty line /No card	49	43	65	57	1.84 (1.06-3.19)	**0.031**
Below poverty line	54	58.1	39	41.9	1	
Type of slum						
SC/ST	24	45.3	29	54.7	1	0.79
Small	36	50.7	35	49.3	1.24 (0.61-2.54)	

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Study variable	BPCR	BPCR	BPCR	BPCR	OR (95%CI)	p
Large	42	50.6	41	49.4	1.23 (0.62-2.47)	
Workplace						
Within city	99	49.5	101	50.5	1.36 (0.3-6.23)	0.691
Out of city	4	57.1	3	42.9	1	

* OR for one year increase in age

Table 4. Association between wife's parity, antenatal care (ANC) and husband's involvement in birth preparedness and complication readiness (BPCR) in urban slums of Mangaluru, Karnataka, India, 2016

(n=207)

Study variable	BPCR	BPCR	BPCR	B
	Suboptimal (n=103) n	Suboptimal (n=103) %	Optimal (n=104)# n	O %
Wife's parity				
Primipara	38	48.1	41	5
Multipara	65	50.8	63	49
Source of ANC				
Public health sector	50	54.9	41	45
Private health sector	53	45.7	63	54
ANC in first trimester				
No	9	69.2	4	30
Yes	94	48.5	100	5
Wife's ANC visits				
Fewer than 4	3	100	0	0
4 or more	100	49	104	5
Husband aware of *JSY*				
No	47	47	53	53
Yes	56	52.3	51	47
Availed the benefits of *JSY*				
No	65	45.8	77	54
Yes	38	58.5	27	4
Husband aware of free transport for delivery				
No	91	52.6	82	47
Yes	12	35.3	22	64
Husband aware of key danger signs				
Aware of < two signs	72	63.2	42	36
Aware of at least 2 danger signs	31	33.3	62	66
Decision maker in seeking care				
Husband	61	46.9	69	53
Wife	30	61.2	19	38
Others	12	42.9	16	57
Husband escorted wife for ANC				
Never	15	78.9	4	2
At least once	88	46.8	100	53

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Study variable	BPCR	BPCR	BPCR	B
Adequately informed about BPCR[#]				
No	100	65.4	53	3
Yes	3	5.6	51	9
Any complication in pregnancy				
No	87	50.9	84	4
Yes	16	44.4	20	5

 # if a man or his wife received information on at least five out of six key elements of BPCR from an ANM/doctor

Table 5. Adjusted analysis of the factors associated with husband's optimal involvement in birth preparedness and complication readiness (BPCR) in urban slums of Mangaluru, Karnataka, India, 2016

(n=207)

Variable for optimal BPCR[#]	Adj OR	95% CI	P
Occupation			
Laborer	1		
Others	2.18	0.9-5.45	0.095
Economic status			
BPL	1		
APL	1.43	0.66-3.1	0.366
Wife's literacy			
Illiterate	1		
Literate	6.5	1.4-28.9	**0.016***
Decision maker in the family			
Others	1		
Man	0.69	0.23-2.1	0.795
Wife	0.69	0.21-2.33	
ANC in first trimester			
No	1		
Yes	7.8	1.01-61.1	**0.049***
Source of ANC			
Public sector	1		
Private sector	2.14	0.91-5.04	0.081
Escorted wife for antenatal care			
Never	1		
At least once	3.5	0.71-17.01	0.124
Availed benefits of JSY			
No	1		
Yes	1.36	0.59-3.1	0.463
Aware of free transport for delivery			
No	1		
Yes	1.15	0.37-3.6	0.811
Aware of minimum two danger signs			
No	1		
Yes	2.03	0.98-4.2	0.057
Received adequate information on BPCR			

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Variable for optimal BPCR[#]	Adj OR	95% CI	P
No	1		
Yes	47.8	10.4-219.8	**<0.001***

AdjOR = Adjusted Odds ratio; CI = Confidence Interval; *p<0.05 (significant)

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`Figure 1.docx`   available   at   https://authorea.com/users/740587/articles/713391-factors-associated-with-husband-s-involvement-in-birth-preparedness-and-complication-readiness-in-urban-slums-of-mangaluru-india-a-cross-sectional-community-based-study