

# Birth Preparedness and Complication Readiness among Adult Males in Chengalpattu District, Tamil Nadu, India: A Cross-sectional Study

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## ABSTRACT

**Introduction:** The active participation of males is vital for enhancing maternal and child health outcomes. Supporting mothers in timely healthcare decisions ensures better access to services and care. The World Health Organisation (WHO) defines maternal mortality as deaths caused by pregnancy-related complications or their management within 42 days of pregnancy termination, excluding incidental causes. Birth Preparedness and Complication Readiness (BPCR) is intended to reduce the three primary delays that lead to maternal mortality: delays in recognising the need for medical care, reaching a healthcare facility and receiving timely and proper treatment.

**Aim:** To assess males' levels of BPCR and identify the factors that influence their participation in these critical aspects of maternal health.

**Materials and Methods:** A community-based cross-sectional study was conducted in Chengalpattu district of Tamil Nadu, India. The research work was carried out from December 2024 to February 2025. The sample size was calculated as 412, and at the end of the data collection, through simple random sampling, 420 samples were collected. Eligible participants were males aged 18 years and above. After obtaining ethical clearance, data collection was carried out using a validated

questionnaire adapted from the Johns Hopkins Programme for International Education in Gynaecology and Obstetrics (JHPIEGO) questionnaire devised by The Maternal and Neonatal Health Programme, affiliated with Johns Hopkins University. Data were analysed using Statistical Package for the Social Sciences (SPSS) version 26.0. Descriptive statistics, Chi-square tests, and logistic regression (both bivariate and multivariate) were applied to assess associations among variables. A p-value of  $<0.05$  was considered statistically significant.

**Results:** Among the 420 individuals, 193 (45.95%) were in the 30-39 years age group. Most participants (267, 63.57%) were first-time fathers. Commonly recognised danger signs during pregnancy include nausea and vomiting and severe headaches, which were recognised by 341 (81.2%) and 249 (59.3%) participants, respectively. Multivariable analysis revealed that cultural influence on decision-making was a statistically significant predictor of BPCR, influencing male participation in maternal health planning (AOR=0.091, 95% CI: 0.057-0.143, p-value  $<0.001$ ).

**Conclusion:** The study infers that early and informed male involvement in BPCR significantly enhances maternal health outcomes, emphasising the need for targeted awareness and engagement strategies.

**Keywords:** Antenatal care, Male participation, Newborn care, Safe motherhood

## INTRODUCTION

Every expectant mother faces the possibility of experiencing obstetric complications, some of which can be life-threatening. BPCR promotes proactive arrangements and ensures timely medical intervention when needed. Maternal mortality remains a major public health concern worldwide. In India, significant progress has been made, with the Maternal Mortality Ratio (MMR) dropping by nearly 70%—from 398 per 100,000 live births in 1997-1998 to 99 per 100,000 live births in 2020. Despite this progress, maternal deaths still occur due to complications during pregnancy, labour, or in the postpartum period [1].

Developing a structured birth plan that incorporates BPCR strategies for expectant mothers, their partners and their families is an essential approach in reducing maternal mortality. BPCR aims to ensure that mothers and newborns have timely access to skilled care by encouraging families to make informed decisions regarding delivery. Given that every pregnancy carries inherent risks, unexpected complications can arise, potentially leading to severe maternal and neonatal health outcomes [1,2]. A study conducted by Boltena MT et al., shows that active male participation in BPCR helps lower maternal anxiety, supports better mental health and improves overall

wellbeing for both mother and child. Furthermore, greater involvement of male partners in BPCR facilitates better access to prenatal and postnatal care while reducing harmful maternal health practices [3]. The Sustainable Development Goal (SDG) Target 3.1 seeks to lower global maternal mortality to less than 70 deaths per 100,000 live births by 2030. Although advancements have been made, low- and middle-income countries still fall behind high-income nations in reaching this target [4,5].

BPCR is based on the principle that early planning for childbirth and potential complications reduces delays in receiving appropriate care. It serves as a framework to promote the use and retention of trained healthcare professionals for maternal and neonatal care, particularly during childbirth and the postpartum period [3]. In recent years, the role of male partners in maternal health has gained recognition. This includes active participation in family planning, maternal and child healthcare, the prevention of high-risk pregnancies and awareness of sexually transmitted infections. According to the WHO, men should not be seen as passive observers or barriers to safe motherhood; rather, they should be encouraged to take an active role in supporting maternal health [6]. In 2015, WHO officially recommended BPCR as a key component of antenatal care, stating that interventions promoting BPCR are associated with increased

utilisation of skilled birth attendants and timely access to obstetric and neonatal emergency care [7,8].

In developed nations, male involvement in BPCR is more prevalent, especially among first-time fathers in planned pregnancies. However, in many developing countries, participation remains low. Maternal mortality is largely impacted by three critical delays: the delay in recognising the need for medical care, the delay in accessing a healthcare facility and the delay in receiving proper treatment. To prevent these delays, comprehensive birth planning is essential. BPCR plays a crucial role in ensuring that families are prepared for both routine deliveries and potential complications [9].

Birth preparation involves educating expectant mothers and their families about the signs of labour. Many families remain unaware of these warning signs, despite the fact that every pregnancy carries some level of risk. Essential components of birth preparedness include selecting a healthcare facility for delivery, arranging for transportation, identifying a birth attendant and recognising obstetric danger signs and emergencies [7]. Studies have highlighted that a lack of awareness regarding BPCR, coupled with inadequate planning for skilled birth assistance, results in negative maternal health outcomes [7,10,11].

Male involvement in BPCR can lead to better healthcare-seeking behaviour among women, ensuring that they receive timely medical attention. Engaged fathers are more likely to encourage their partners to seek obstetric care, thereby reducing all three phases of delays: decision-making, reaching a healthcare facility and receiving treatment. In low-resource settings, men play a crucial role in mitigating the first and second types of delays, ultimately improving birth outcomes [12-14]. Since there was no similar study in this area, nor a study that includes men who are yet to get married, this study was planned to evaluate men's awareness and preparedness for birth and its complications while examining the factors that influence their involvement in it.

## MATERIALS AND METHODS

This community-based cross-sectional study was conducted in Chengalpattu district, Tamil Nadu, India, over a three-month period from December 2024 to February 2025. Institutional ethical committee permission was obtained (SRMIEC-ST1124-1746), and informed consent was taken from the participants. Confidentiality was assured to all participants.

**Inclusion criteria:** Adult males aged 18 years and above, covering both married and unmarried individuals, were included in the study.

**Exclusion criteria:** Males who were not willing to participate and those below 18 years of age were excluded from the study.

**Sample calculation and sampling method:** The sample size was determined using the formula:

$$n = Z^2 Pq/d^2$$

Where:

n=Sample size

Z=1.96 (for 95% Confidence Interval)

P=Prevalence

q=100-P

d=Precision

The study by Boltena MT et al., [3] provided a prevalence (P) value of 42.4%, with q as 57.6% and d as 5, resulting in a sample size of 375. With a 10% non response rate, the sample size was calculated as 412. Participants were selected using a simple random sampling method, and 420 samples were collected by the end of the data collection.

**Study tool:** A standardised and validated questionnaire, adapted from the Johns Hopkins University-affiliated JHPIEGO questionnaire devised by the Maternal and Neonatal Health Programme [15], was used for data collection. To ensure clarity, reliability and relevance, a

pilot study was carried out among 42 participants (10% of the study population), and changes were incorporated based on feedback to enhance the questionnaire. The finalised tool was administered in the local language to ensure comprehension and strict confidentiality measures were maintained throughout the study. Experts reviewed the content validity to confirm the accuracy and relevance of the questionnaire items.

The questionnaire included basic demographic details along with 39 questions. Males were categorised as well prepared or not well prepared based on whether they had considered at least three of the following steps important in the childbirth process: preparing a birth kit, identifying a skilled attendant, saving money, identifying a place of delivery, contacting a blood donor in advance and preparing transportation in advance [16]. In this study, 12 questions focused on the danger signs of pregnancy; those who agreed with six or more were considered to have good knowledge, while those who agreed with fewer than six were considered to have poor knowledge [17]. There were seven questions on danger signs during delivery and six on danger signs during the postpartum period; if the participant agreed with four or more in both categories, they were considered to have good knowledge; if fewer than four, they were considered to have poor knowledge [17]. Similarly, those who correctly answered five or more questions out of nine on BPCR were considered to have good knowledge, while those who answered fewer than five were classified as having poor knowledge [17].

## STATISTICAL ANALYSIS

Data were analysed using SPSS version 26.0. Descriptive statistics, Chi-square tests, and logistic regression (both bivariate and multivariate) were applied to assess associations among variables. A p-value <0.05 was considered statistically significant.

## RESULTS

A total of 420 males participated in this study. The age of the study participants ranged from 20 to 60 years, with the majority of participants, 193 (45.95%), being between the ages of 30 and 39 years. From [Table/Fig-1], it is clear that the majority were married, 237 (56.43%), while others were unmarried, 183 (43.57%). Most

Characteristics	n (%)
<b>Age (years)</b>	
20-29	99 (23.57)
30-39	193 (45.95)
40-49	106 (25.24)
≥50	22 (5.24)
<b>Marital status</b>	
Married	237 (56.43)
Unmarried	183 (43.57)
<b>Religion</b>	
Hindu	279 (66.43)
Christian	38 (9.05)
Muslim	86 (20.48)
Others	17 (4.05)
<b>Number of children</b>	
No children	267 (63.57)
1-4	141 (33.57)
>4	12 (2.86)
<b>Education level</b>	
Illiterate	14 (3.33)
Primary	64 (15.24)
Secondary	109 (25.95)
Undergraduate	136 (32.38)
Postgraduate	97 (23.09)

Occupation		
Employed	344 (81.90)	
Unemployed	69 (16.43)	
Student	7 (1.67)	
Residence		
Rural	148 (35.24)	
Urban	272 (64.76)	

[Table/Fig-1]: Demographic status of the participants.

men were Hindu, 279 (66.43%), while other religions comprised smaller percentages. Among the participants, 267 (63.57%) had no children, while only 12 (2.86%) had more than four children. Education levels were fairly high, with 136 (32.38%) being undergraduates and 97 (23.09%) being postgraduates, while only 14 (3.3%) were illiterate. A total of 344 (81.90%) men were employed, and 272 (64.76%) lived in urban areas.

[Table/Fig-2] shows that the most commonly recognised danger signs included nausea and vomiting, 341 (81.2%), and severe headache, 249 (59.3%). The less widely identified danger signs were difficulty in breathing and loss of consciousness, identified by 94 (22.4%) and 97 (23.1%) participants, respectively. Knowledge about convulsions, 162 (38.6%), and vaginal bleeding, 126 (30%), was moderate, indicating room for improvement in awareness.

Danger sign indicators	Yes, n (%)	No, n (%)
Convulsion	162 (38.6)	258 (61.4)
Nausea and vomiting	341 (81.2)	79 (18.8)
Severe abdominal pain	112 (26.7)	308 (73.3)
Vaginal bleeding	126 (30)	294 (70)
Swollen leg and face	203 (48.3)	217 (51.7)
Difficulty in breathing	94 (22.4)	326 (77.6)
Severe headache	249 (59.3)	171 (40.7)
Accelerated and reduced foetal movement	142 (33.8)	278 (66.2)
High-grade fever	164 (39)	256 (61)
Blurred vision	198 (47.1)	222 (52.9)
Water breaks without labour	129 (30.7)	291 (69.3)
Loss of consciousness	97 (23.1)	323 (76.9)

[Table/Fig-2]: Awareness of danger signs during pregnancy among participants.

Among the participants, the most recognised danger sign during delivery was loss of consciousness, 315 (75%), followed by excessive vaginal bleeding, 295 (70.2%), while awareness was notably low for retained placenta, 104 (24.8%) [Table/Fig-3].

Danger sign indicators	Yes, n (%)	No, n (%)
Excessive vaginal bleeding	295 (70.2)	125 (29.8)
Abnormal body movements	187 (44.5)	233 (54.5)
Retained placenta	104 (24.8)	316 (75.2)
High fever	208 (49.5)	212 (50.5)
Prolonged labour	254 (60.5)	166 (39.5)
Severe headache	266 (63.3)	154 (36.7)
Loss of consciousness	315 (75)	105 (25)

[Table/Fig-3]: Awareness of danger signs during delivery among participants.

A total of 330 (78.6%) study participants failed to recognise foul-smelling discharge as a danger sign during the postpartum period, while 268 (63.8%) participants identified excessive vaginal bleeding as a critical warning sign during this time [Table/Fig-4].

[Table/Fig-5] clearly indicates that most men identified critical components like the place of delivery, 398 (95.52%), and transportation, 298 (71.52%). However, fewer participants arranged for blood donors, 92 (22.08%), or for postpartum cultural food expenses, 154 (36.96%). Savings for emergencies were managed

by 293 (70.32%) participants, and the provision of clean clothes for the mother and baby was addressed by 367 (88.08%) participants.

Danger sign indicators	Yes, n (%)	No, n (%)
Excessive vaginal bleeding	268 (63.8)	152 (36.2)
High fever	188 (44.8)	232 (55.2)
Abnormal body movements	197 (46.9)	223 (53.1)
Loss of consciousness	205 (48.8)	215 (51.2)
Foul smelling discharge	90 (21.4)	330 (78.6)
Severe headache	130 (30.9)	290 (69.1)

[Table/Fig-4]: Awareness of danger signs during the postpartum period among participants.

Items of BP/CR	Yes, n (%)	No, n (%)
Is planning for postpartum cultural food expenses necessary?	154 (36.96)	266 (63.84)
Is savings for emergencies important?	293 (70.32)	127 (30.48)
Is arranging for skilled birth assistance required?	156 (37.44)	264 (63.36)
Is identifying a mode of transportation for delivery or emergencies mandatory?	298 (71.52)	122 (29.28)
Have you identified the decision makers in case of an emergency?	134 (32.16)	286 (68.64)
Is there a need to identify the place of delivery at the earliest?	398 (95.52)	22 (5.28)
Have you arranged for potential blood donors?	92 (22.08)	328 (78.72)
Is having a clean clothes and essential supplies for mother and baby required?	367 (88.08)	53 (12.72)
Is it needed to take steps for the prevention of Mother-to-child transmission of HIV?	169 (40.56)	251 (60.24)

[Table/Fig-5]: Participants' knowledge of Birth Preparedness and Complication Readiness (BPCR).

[Table/Fig-6] assesses the men's perspectives on participation during pregnancy, delivery and the postpartum period. A total of 178 (42.38%) strongly agreed that males should accompany their wives during Antenatal Care (ANC) visits, while 27 (6.43%) strongly disagreed. A strong majority, 318 (75.71%), believed males should accompany their wives to the hospital for delivery. Only

Characteristics	n (%)
<b>Men should accompany the wife to the ANC</b>	
Strongly agree	178 (42.38)
Agree	143 (34.05)
Disagree	72 (17.14)
Strongly disagree	27 (6.43)
<b>Men should accompany the wife to the hospital for delivery</b>	
Strongly agree	318 (75.71)
Agree	87 (20.71)
Disagree	15 (3.57)
Strongly disagree	-
<b>Men should accompany the wife to the labour room</b>	
Strongly agree	77 (18.33)
Agree	86 (20.48)
Disagree	98 (23.33)
Strongly disagree	23 (5.48)
Doesn't know	136 (32.38)
<b>Men should accompany the wife for postnatal care</b>	
Strongly agree	267 (63.57)
Agree	126 (30)
Disagree	20 (4.76)
Strongly disagree	7 (1.67)

[Table/Fig-6]: Men's perspectives in participation during pregnancy, delivery, and postpartum period.

77 (18.33%) strongly agreed that males should accompany their wives to the labour room, while 136 (32.38%) were unsure. Most men, 267 (63.57%), strongly agreed that males should accompany their wives for postnatal care, showing higher acceptance.

[Table/Fig-7] explores factors influencing males' participation in BPCR through both bivariate (COR) and multivariate (AOR) logistic regression analyses and p-values. The multivariate analysis revealed that cultural influence on decision-making was a statistically significant predictor of BPCR, influenced male participation in maternal health planning (AOR=0.091, 95% CI: 0.057-0.143, p-value <0.001). Additionally, knowledge of postpartum danger signs was significantly associated with birth preparedness (AOR: 2.421, 95% CI: 1.368-4.283, p-value=0.003). Other variables, including knowledge of ANC, BPCR and discussion on delivery plans, did not show statistically significant associations with BPCR status.

Variables	Birth Preparedness and Complication Readiness (BPCR)		COR (95% CI)	AOR (95% CI)	p-value
	Not well prepared (n=182)	Well prepared (n=238)			
<b>Identify the need for ANC during pregnancy</b>					
Yes	162	216	1.21 (0.640-2.296)	0.825 (0.435-1.563)	0.623
No	20	22	1	1	
<b>Know the danger signs of pregnancy</b>					
Poor knowledge	24	34	1	1	0.777
Good knowledge	158	204	0.911 (0.519-1.599)	1.097 (0.625-1.925)	
<b>Have knowledge of the BPCR plan</b>					
Poor knowledge	30	43	1	1	0.698
Good knowledge	152	195	0.895 (0.536-1.494)	1.117 (0.669-1.865)	
<b>Know the danger signs during labour and delivery</b>					
Poor knowledge	74	96	1	1	1.000
Good knowledge	108	142	1.014 (0.684-1.502)	0.987 (0.666-1.462)	
<b>Discussion on a place of delivery</b>					
Yes	129	175	1.141 (0.742-1.755)	0.876 (0.570-1.347)	0.583
No	53	63	1	1	
<b>Discussion on delivery plan</b>					
Yes	123	181	1.523 (0.991-2.342)	0.657 (0.427-1.009)	0.061
No	59	57	1	1	
<b>Discussion of a postnatal plan</b>					
Yes	115	152	1.030 (0.690-1.537)	0.971 (0.650-1.450)	0.919
No	67	86	1	1	
<b>Cultural influence on decisions</b>					
Yes	49	191	11.030 (6.982-17.426)	0.091 (0.057-0.143)	<0.001
No	133	47	1	1	
<b>Knowledge of danger signs during postpartum</b>					
Poor knowledge	146	216	1	1	0.003
Good knowledge	36	22	0.413 (0.233-0.731)	2.421 (1.368-4.283)	

**[Table/Fig-7]:** Bi-variable and multivariable logistic regression analyses of factors influencing BPCR among males.

## DISCUSSION

This study highlights male involvement in maternal health. Among the 420 participants, 193 (45.95%) were aged between 30 and 39 years, with a majority, 267 (63.57%), being first-time fathers. It has been demonstrated that male participation reduces maternal and

newborn morbidity and mortality. The most commonly recognised danger signs included nausea and vomiting in 341 (81.2%) and severe headaches in 249 (59.3%). In comparison, awareness of symptoms such as breathing difficulties (94 (22.4%)), loss of consciousness (97 (23.1%)), convulsions (162 (38.6%)), premature water breakage without labour (129 (30.7%)), and vaginal bleeding (126 (30%)) was lower, indicating areas requiring further attention.

This study revealed, though statistically non significant, higher BPCR preparedness among men with limited knowledge of obstetric danger signs compared to those with greater awareness. This suggests that men who lack knowledge may compensate by engaging in BPCR activities, possibly by seeking guidance from their partners or healthcare professionals. Arohee S et al., observed similar trends in rural Maharashtra, where men lacking knowledge of pregnancy-related complications exhibited increased involvement when actively seeking information from family or healthcare providers [9].

It was discovered that 95.52% of couples in this study agreed on the need to identify a place of birth, whereas 95.5% of couples in their study had done so. Similarly, they found that 91% had identified a birth attendant, whereas only 37.44% agreed to this in present study. Their study reported that 92% of participants had made transportation arrangements, compared to 71.52% in this study. Additionally, they found that 77% possessed emergency savings, compared to 70.32% in this study. Lastly, 37% of the participants in their study had identifiable blood donors, compared to 22.08% in this study. These comparisons suggest possible areas for intervention and development in both contexts by highlighting the differences in BPCR between Chengalpattu district and central rural India.

Roudsari RL et al., identified key themes influencing male participation in BPCR, including limited access to comprehensive maternal healthcare services, economic constraints, sociocultural norms and personal attitudes towards reproductive healthcare [18]. These findings align with the present study, which highlights the impact of cultural beliefs on male engagement in BPCR.

Given the patriarchal nature of many Indian communities, men often perceive childbirth as a feminine responsibility, which may contribute to their limited engagement in non financial BPCR activities. Addressing these gendered perceptions is crucial for promoting a more inclusive approach to maternal healthcare [19,20]. Research has linked prenatal male involvement with positive maternal and child health outcomes, including increased antenatal care attendance, reduced alcohol and tobacco consumption, adherence to Human Immunodeficiency Virus (HIV) prevention strategies and improved preparedness for delivery-related complications [21-25].

Findings from the National Family Health Survey (NFHS-5) [26] suggest that states with better healthcare infrastructure, such as Tamil Nadu and Kerala, report higher levels of male involvement in BPCR. In contrast, states like Uttar Pradesh and Bihar face significant challenges due to cultural barriers and inadequate healthcare access, highlighting the need for region-specific strategies to improve male participation in maternal health initiatives.

Several recommendations that can improve outcomes include developing and implementing educational programmes, encouraging men to accompany their spouses to antenatal care visits and actively participate in maternal health decisions, introducing culturally sensitive programmes to address traditional beliefs that may hinder male engagement in BPCR, improving accessibility to maternal healthcare services, training healthcare professionals to support and encourage male participation and implementing interventions to educate families on identifying danger signs and responding to complications effectively.

Understanding the key determinants of current male involvement in maternal healthcare aids in the development of policies and healthcare training initiatives to enhance male participation in BPCR. Increased

male engagement has the potential to significantly reduce maternal and neonatal mortality rates. Encouraging men to accompany their wives to antenatal care visits and educating them about pregnancy complications and danger signs is crucial.

## Limitation(s)

However, this study has limitations. It does not explore in depth the behavioural changes in males over time, necessitating further research using qualitative methodologies and larger sample sizes. Additionally, some social factors, like migration status, social stigma and the role of the mother-in-law, which influence BPCR participation, were not extensively analysed. Future studies should incorporate diverse populations and varied study designs to obtain a more comprehensive understanding of these predictors.

## CONCLUSION(S)

This study concludes that the knowledge of danger signs during labour, pregnancy and the postpartum period was moderate. Cultural influence on decision-making was a strong and statistically significant predictor of BPCR, which influences male participation in maternal health planning. These findings underscore the importance of targeted interventions and educational efforts to enhance male participation in maternal healthcare, ultimately contributing to safer pregnancies and deliveries.

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7

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