

## Pregnancy Outcomes among High-Risk Mothers Attending Primary Health Centres of Bhavnagar District, Gujarat

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### Abstract :

**Introduction:** All pregnancies and deliveries are potentially at risk. However, there are certain categories of pregnancies where the mother, the foetus or the neonate is in a state of increased jeopardy. Some pregnancies become high-risk as they progress, while some women are at increased risk for complications even before they get pregnant for a variety of reasons. **Objectives:** To assess the outcome of the pregnancy of the high-risk mothers. **Method:** It was a cross-sectional study conducted among the high-risk mothers of Bhavnagar district during the period from March 2017 to August 2018. 10 PHCs (5 worst+ 5 best performing PHCs) were selected using PHC score card. From each selected PHCs, 3 sub centres were selected randomly. From each selected sub centre, 3 high-risk mothers were randomly selected and interviewed. **Results:** From the worst performing PHCs, 28.9% of the mothers and from the best performing PHCs, 40% of the mothers had caesarean delivery(CS). 6.7% of the mothers from the each group of PHCs delivered preterm babies. Low birth weight babies were delivered to 46.7% of the mothers from the worst performing PHCs as against 22.2% of the mothers from the best performing PHCs. Still birth rate(SBR) in the mothers of worst and best performing PHCs was found 22.2 and 44.4 respectively. And neonatal mortality rate(NMR) in the mothers of the best performing PHCs was found 46.5. **Conclusion:** SBR, NMR and proportion of CS delivery were higher among the mothers of best performing PHCs as compare to worst performing PHCs (P>0.05).

**Key Words :** High-Risk, Outcome, Pregnancy, Risk Factors

### Introduction :

A high-risk pregnancy is broadly defined as one in which the mother, foetus, or newborn is, or may possibly be, at increased risk of morbidity or mortality before, during, or after delivery.<sup>[1]</sup> Of all pregnancies, about 20-30% of pregnancies belong to high-risk category. Even with adequate antenatal and intranatal care, this small group is responsible for 70-80% of perinatal mortality and morbidity.<sup>[2]</sup>

Perinatal outcome can be changed significantly by early detection followed by special intensive care of high-risk pregnancies. Research has shown that small and affordable measures can significantly reduce the health risks that women face when they become pregnant. Most maternal morbidity and mortality could be prevented if women had access to appropriate and timely health care during pregnancy, childbirth and immediately afterwards.

It is essential to give special attention for high risk group which will reduce perinatal and maternal mortality and morbidity. Thus, it is need to study outcome in high -risk pregnancy which will be helpful for future health planning to avoid poor outcome and to improve the management of high-risk pregnancy. The present study was intended to assess the outcome of high-risk pregnancy among the high-risk mothers.

### Objectives:

1. To assess the maternal and foetal outcome of high-risk pregnancy among the high-risk mothers.
2. To find out the association between mothers' addiction and birth weight of babies.
3. To find out the association between ANC visits and birth weight of babies.

**Method:**

It was a cross-sectional study conducted in 5 worst performing and 5 best performing PHCs of Bhavnagar district during the period between March 2017 to August 2018. The study sample consisted of 90 high-risk mothers (45 high-risk mothers each from the worst and the best performing PHCs). The high-risk mothers, who were not willing to participate in the study were excluded from the study.

Permission was obtained from Chief District Health Officer of Bhavnagar district and in the first stage, 5 best performing and 5 worst performing PHCs were selected by using total composite index calculated from PHC score card. Total composite index includes different indices like pregnancy care group index (which includes early pregnancy registration, no. of ANC visit, 100 tablets of IFA, Inj. TT), child birth group index (status of birth, institutional delivery), reproductive age group index, post natal mother and newborn care group index. All the indices were given equal weightage to formulate total composite index.

The lowest total composite index among the selected best performing PHCs was 0.82 and the highest total composite index among the selected worst performing PHCs was 0.24.

In the second stage, from each selected PHC, 3 sub-centers and finally 3 high-risk mothers from each selected sub-center were selected by simple random sampling using lottery method. If 3 high-risk mothers were not available in that sub-centre, another sub-centre was selected by using lottery method.

A semi-structured questionnaire was designed, which was corrected by conducting a pilot study among 10 high-risk mothers from the nearby PHC.

All the selected high-risk mothers defined according to the government guideline by Female Health Worker and Medical Officer were interviewed in a local language, at a place and time convenient to the participant. All the mothers were interviewed 42 days to 75 days after the delivery and information regarding place of delivery, term of delivery, mode of delivery, birth outcome, birth weight, addiction of mothers, number of ANC visits etc. was collected.

Informed written consent was obtained from all

the participating mothers after explaining the nature and purpose of the study in the local language. Privacy was ensured while taking the interview. Ethical approval was obtained from the IRB, Government Medical College, Bhavnagar for conducting this study.

A face validation of the questionnaire was done. The study procedures from recruitment till data entry were piloted for feasibility and for making any changes in the procedures. The 2<sup>nd</sup> version of the questionnaire was used for the study. Data entry was done in Epi Info software version 7.0 with appropriate data checks in order to avoid errors in data entry. The study findings can be generalized to the high-risk mothers registered in the PHCs of the Bhavnagar district of Gujarat as the sample was selected from the population of high-risk mothers registered in the PHCs of Bhavnagar district.

**Results:**

This study assessed the maternal and foetal outcome of high-risk pregnancy among the high-risk mothers of Bhavnagar district, Gujarat.

As observed from the table 1, in the worst performing PHCs, 80% of high-risk mothers were between the age group of 25-35 years, while in the best performing PHCs, 68.9% of the high-risk mothers were between the age group of 25-35 years.

Almost all the selected mothers were Hindus in both types of PHCs. In the worst performing PHCs, 37.7% of the high-risk mothers were illiterate, while in the best performing PHCs, 28.8% of the high-risk mothers were illiterate. According to the Modified Prasad classification, among the high-risk mothers, in the worst performing PHCs, 46.7% of the mothers were from the lower middle class and 26.7% of the mothers were from the middle class, while in the best performing PHCs, 53.3% of the mothers were from the lower middle class and 24.5% mothers were from the lower class.

As observed from the table 2, 6.7% of the mothers from the each group of PHCs delivered preterm babies.

From the worst performing PHCs, 28.9% of the mothers and from the best performing PHCs, 40.0% of the mothers were delivered by caesarean section. The proportion of caesarean delivery found to be higher in

**Table 1: Socio-Demographic Profile of the Selected High-risk Mothers of Bhavnagar District**

Socio demographic factors	Groups	Number of the high-risk mothers (%)	
		Worst performing PHCs (n=45)	Best performing PHCs (n=45)
Age (In completed years)	<25 years	8 (17.8)	12 (26.7)
	25-35 years	36 (80.0)	31 (68.9)
	>35 years	1 (2.2)	2 (4.4)
Religion	Hindu	43 (95.6)	45 (100)
	Muslim	2 (4.4)	0
Caste	SC	2 (4.4)	5 (11.1)
	OBC	38 (84.5)	33(73.3)
	General	5 (11.1)	7 (15.6)
Education	≥High school	3 (6.7)	3 (6.7)
	Middle school	4 (8.9)	8 (17.8)
	Primary school	21 (46.7)	21 (46.7)
	Illiterate	17 (37.7)	13(28.8)
Occupation	Housewife	32 (71.1)	40 (88.9)
	Labour	4 (8.9)	1 (2.2)
	Agriculture	9 (20.0)	4 (8.9)
Modified Prasad Socio-economic class	Upper middle class II	6 (13.3)	2 (4.4)
	Middle class III	12 (26.7)	8 (17.8)
	Lower middle class IV	21 (46.7)	24 (53.3)
	Lower class V	6 (13.3)	11 (24.5)

the best performing PHCs than the other group.

In the present study, 2.2% of the mothers from the worst performing PHCs and 4.4% of the mothers from the best performing PHCs had still birth. Low birth weight babies were delivered to 46.7% of the mothers from the worst performing PHCs as against 22.2% of the mothers from the best performing PHCs. The difference observed was found statistically significant. (P=0.015)

As observed from the table 3, all of the high-risk mothers from both the groups of the PHCs were found alive after 42 days of delivery. In the worst and best performing PHCs, 2.2% and 4.4% of the delivery

resulted in still birth respectively. In the best performing PHCs, 4.4% of the babies delivered to the high risk mothers died during their neonatal period, however none of the babies were died from the worst performing PHCs during the period. So in this study, neonatal mortality rate of the infants delivered to high-risk mothers from the best performing PHCs was 46.5/1000 live births.

It was found in the study that in the worst performing PHCs, 33.3% of the mothers with tobacco addiction delivered LBW babies. In the best performing PHCs, 14.3% of the addicted mothers delivered LBW babies. It was also found that in the

**Table 2: Distribution of the High-risk Mothers for Various Intranatal Parameters in Worst and Best Performing PHCs**

Various parameters	Worst performing PHCs n=45 (%)	Best performing PHCs n=45 (%)	Chi - square	P-value	OR (95% CI)
<b>Term of delivery</b>					
Preterm	3 (6.7)	3 (6.7)	0.000	1.000	1.000
Term	42 (93.3)	42 (93.3)	df=1		(0.191-5.241)
<b>Mode of delivery</b>					
Normal	32 (71.1)	27 (60.0)	1.230	0.267	1.641
Caesarean	13 (28.9)	18 (40.0)	df=1		(0.682-3.949)
<b>Birth outcome</b>					
Live birth	44 (97.8)	43 (95.6)	0.557	0.557	2.047
Still birth	1 (2.2)	2 (4.4)	df=1		(0.179-23.409)
<b>Birth weight</b>					
<2.5kg	21 (46.7)	10 (22.2)	0.015	0.015	3.063
>2.5 kg	24 (53.3)	35 (77.8)	df=1		(1.227 7.645)

**Table 3: Status of the High-risk Mothers and Infants after 42 days of delivery**

	Number of deaths (%)	
	Worst performing PHCs (n=45)	Best performing PHCs (n=45)
Mothers	0	0
Still Birth	1 (2.2)	2 (4.4)
Neonatal Death	0	2 (4.4)

worst performing PHCs, 38.1% of the mothers with less than 4 ANC visits delivered LBW babies. In the best performing PHCs, 16.7% of the mothers with less than 4 ANC visits delivered LBW babies.

**Discussion:**

In the present study, 6.7% of the high-risk mothers

from the each group of PHCs delivered preterm babies. H. Akthar et al (2009) in their study in Bangladesh found that 17.69% of the high-risk mothers delivered preterm babies<sup>[3]</sup>, which was higher than the present study.

In the present study, 28.9% and 53.3% of the high-

risk mothers from worst and best performing PHCs respectively delivered in government facility. Out of the 5 selected worst performing PHCs, delivery services was not provided at 1 of the PHCs, which may be the reason for less number of deliveries in the government institutions in the worst performing PHCs compare to the best performing PHCs. Significant number of deliveries in the study group, which consisted of high risk mothers were not getting delivered in government institutions, which might be because of people's perception that the private institution provides better quality care. According to the NFHS-4, in India, 52.1% of the institutional delivery were conducted in the public facility.<sup>[4]</sup> A. Jadhoo et al (2017) in their study in rural area of Nagpur district found that 1.39% of the high-risk mothers had home delivery and 98.61% of the high-risk mothers had institutional delivery.<sup>[5]</sup>

In the present study, 28.9% and 40.0% of the high-risk mothers from worst and best performing PHCs respectively delivered by caesarean section, which was found lower than the other study conducted among high-risk mothers of different geographic areas. According to the NFHS-4, in India, caesarean section rate was 17.2% among all the pregnant women.<sup>[4]</sup> A. Jadhoo et al (2017) in their study in rural area of Nagpur district found that 68.0% of the high-risk mothers had caesarean delivery.<sup>[5]</sup> E. Kashani et al (2012) in their study in Iran found that 58.1% of the high-risk mothers had caesarean delivery.<sup>[6]</sup> H. Akthar et al (2009) in their study in Bangladesh found that 70.8% of the high-risk mothers had caesarean delivery.<sup>[3]</sup> V. Kolluru (2016) in their hospital based study in Telagana found that 82.5% of the high risk mothers had operative intervention either caesarean section or instrumental vaginal delivery.<sup>[7]</sup>

In the present study, 2.2% and 4.4% of the high-risk mothers from worst and best performing PHCs respectively had still birth. A. Jadhoo et al (2017) in their study in rural area of Nagpur district found that 1.39% of the high-risk mothers had still birth<sup>[5]</sup>, which was lower than then the present study. H. Akthar et al (2009) in their study in Bangladesh found that 3.53% of the high-risk mothers had still birth.<sup>[3]</sup>

In the present study, to 46.7% and 22.2% of the high-risk mothers from the worst and best performing PHCs respectively delivered low birth

babies. A. Jadhoo et al (2017) in their study in rural area of Nagpur district found that 20.83% of the high-risk mothers delivered LBW babies.<sup>[5]</sup> V. Kolluru (2016) in their hospital based study in Telagana found that 20.0% of the high-risk mother had LBW babies.<sup>[7]</sup> E. Kashani et al (2012) in their study in Iran found that 21.3% of the high-risk mothers had preterm or LBW babies.<sup>[6]</sup> H. Akthar et al (2009) in their study in Bangladesh found that 6.6% of the high-risk mothers had LBW babies.<sup>[3]</sup>

Socio-demographic variables and place of delivery: In the present study, it was observed that in the best performing PHCs as the level of education increased, the proportion of delivery in the government hospital increased. But the association was not found statistically significant. (P=0.623) There was no specific trend or association found between socio-economic class and place of delivery in any of the group of PHCs.

J. Sahoo et al (2015) in their study among pregnant mothers in rural field practice area of Maulana Azad Medical Collge, New Delhi found significant association of proportion of institutional delivery with higher education and also with more wealth.<sup>[8]</sup>

Socio-demographic variables and mode of delivery: In the worst performing PHCs, proportion of caesarean delivery was found higher in the mothers who were studied more than middle class compare to the mothers studied less than middle class. In the best performing PHCs, the proportion of caesarean delivery was found higher in mothers who studied till middle class as compare to other categories.

The proportion of caesarean delivery was higher in socio-economic class II and III compare to class V and VI in both the groups of the PHCs. The associations of the level of education and socio-economic class of the high-risk mothers with mode of delivery were not found statistically significant.

M. Khan et al (2017) in their study based on Bangladesh Demographic and Health Survey conducted between 2004 and 2014, found increased rate of caesarean delivery with higher level of formal education and also with higher socio-economic status.<sup>[9]</sup>

Socio-demographic variables and birth weight: From the worst performing PHCs, all the mothers,

aged less than 25 years delivered LBW babies. The association found between the age of the mother and delivery of the LBW babies was found statistically significant. ( $P=0.002$ ) The associations of the other socio-demographic variables i.e. education, occupation and socio-economic class with the delivery of LBW babies were also not found statistically significant in the mothers of any of the groups of the PHCs.

N. Gogoi (2017) in their study among the pregnant mothers in Guwahati found higher risk of delivery of LBW babies with lower level of education, with lower socio-economic status and among employed mothers.<sup>[10]</sup>

Addiction of the mother and birth weight: In the worst performing PHCs, 33.3% of the mothers with tobacco addiction had delivered LBW babies. In the best performing PHCs, 14.3% of the addicted mothers had delivered LBW babies. The association between the presence of tobacco addiction and birth weight of the infants among the high-risk mothers was not found statistically significant in any of the group of the PHCs. ( $P=0.3700$  and  $P=0.5825$  respectively)

R. Agrawal et al (2009) in their study among pregnant mothers in Varansi found significant negative correlation between birth weight and maternal addiction.<sup>[11]</sup>

Antenatal care visits and birth weight: In the worst performing PHCs, 38.1% of the mothers with less than 4 ANC visits had delivered LBW babies. In the best performing PHCs, 16.7% of the mothers with less than 4 ANC visits had delivered LBW babies. The association of the frequencies of ANC visits and delivery of the LBW babies among the high-risk mothers was not found statistically significant in any of the group of the PHCs. ( $P=0.539$  and  $P=0.637$ )

### Conclusion:

From the worst performing PHCs, 28.9% of the mothers and from the best performing PHCs, 40% of the mothers had caesarean delivery. 6.7% of the mothers from the each group of PHCs delivered preterm babies. Low birth weight babies were delivered to 46.7% of the mothers from the worst performing PHCs as against 22.2% of the mothers from the best performing PHCs.

### Declaration:

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Conflict of interest: Nil

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