

Home Delivery Practices among Pregnant Women in Southeast of Iran and Associated Factors after the Implementation of the Health Transformation Plan: a Case-control Study

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Abstract

Background: Free-of-charge vaginal deliveries have been offered as part of the Health Transformation Plan (HTP) in Iran, but still a high proportion of deliveries are occurring at home. This study aimed to investigate the reasons for home deliveries after the implementation of HTP in southeast of Iran.

Methods: This case-control study included women who gave birth at home between September 2015 and September 2016 for their last pregnancy; considered as cases (n=300), and women who delivered at a health facility (hospital or Safe Delivery Posts), assigned to the control group (n= 600). Data were collected during face to face interview using a 77-item semi-structured questionnaire. A multivariable logistic regression technique was used to identify independent predictors of home delivery.

Results: Women who were worried about giving birth at a teaching hospital (OR=1.9, 95% CI:1.3 -2.8), women with negative experiences in the previous delivery (OR=1.6, 95% CI:1.0-2.4), illiterates (OR=3.8, 95% CI: 2.0-7.4), individuals with primary/secondary education (OR=2.3, 95% CI: 1.3 - 4.4), women with no health insurance (OR=5.1, 95% CI: 3.5-7.4), if the decision on choosing the place of birth was made by the women alone (OR=12.7, 95% CI: 7-22.8), women with financial constraints (OR=1.7, 95% CI: 1.2-2.4), women with precipitate labour (OR=2.4, 95% CI: 1.7-3.5) and women with fear of the hospital environment (OR= 1.6, 95% CI: 1.1- 2.4) were more likely to deliver at home.

Conclusions: Our findings highlight socio-economic and cultural barriers that need to be addressed to reduce home deliveries among the disadvantaged women.

Keywords: Home Childbirths, Place of Delivery, Health Transformation Plan, Zahedan, Iran

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1. Introduction

The pregnancy-related mortality ratio fell by about 38% worldwide between 2000 and 2017. Pregnancy-related problems are the leading cause of unacceptably substantial percentage of pregnant women deaths that are mostly preventable (1). Globally, it has been estimated that nearly 295,000 women died in 2017, as a result of pregnancy or delivery complications, and approximately 94% of maternal fatal cases were reported in low and lower middle-income countries (1).

Delivery by skilled birth attendants (SBAs) is one of the main components of maternal health services, and it

has a significant impact on saving the lives of women. The World Health Organization (WHO) encourages all pregnant women to have deliveries overseen by a skilled birth attendant (2). Availability of skilled labour and basic emergency obstetric interventions are vital to improve the chance of survival of pregnant women experiencing complicated deliveries. On the other hand, home deliveries are associated with infection, and other adverse neonatal and maternal outcomes (3).

The percentage of deliveries in which skilled midwives are present that they can identify and effectively manage complications of pregnancy and labour is still low in developing countries. Moreover, a large number of

pregnant women with serious maternity outcomes give births attended by unskilled relatives and traditional midwives (4). In such settings that complications are difficult to predict, access to emergency obstetric care is of the greatest challenge. Most of those pregnant women usually do not seek healthcare services provided by maternity units until the complications of childbirth has occurred (5). In many countries, efforts have been made to offer free-of-charge maternity and childbirth services, and to promote institutional deliveries in order to diminish maternal deaths (6). Accordingly, the Iran's Ministry of Health has implemented many interventions for decades to stop preventable maternal deaths by promoting childbirth in hospitals and safe delivery facilities. However, the use of delivery facilities for childbirth in some parts of Iran is still below the recommended level and there is a striking variation between different geographical areas in the percentage of institutional deliveries. For instance, the prevalence of home deliveries in Zahedan, Sistan and Baluchestan Province, Iran was reported at 4.67%, 32.42%, 14%, respectively (7). In a recent development in Iran and as part of Health Transformation Plan that has been implemented since May 2014, free-of-charge normal vaginal deliveries have been offered by public hospital (8). However, in Sistan and Balouchestan Province, despite recent investments in building labour, delivery, and recovery rooms (LDR) in all hospitals and establishment of rural safe delivery facilities, the proportion of childbirths in delivery units is still below the average country figures. Identifying the reasons behind the underutilization of health facilities for child birth in underprivileged settings such as Sistan and Balouchetsan Province is important to design targeted strategies to increase the number of women giving birth in delivery facilities and lower maternal deaths. The aim of this study was to investigate the factors associated with home births after the implementation of the Health Transformation Plan in Sistan and Balouchetsan Province, Iran.

2. Methods

2.1. The study setting

A community-based case-control study was conducted in Zahedan, southeast of Iran. The study subjects were all women who gave birth between

September 2015 and September 2016; almost a year after the Health Transformation Plan, and attended the Maternal and Child Health Clinics for new born baby care and vaccination services. Cases were women who gave birth at home during their most recent pregnancy (n=300). Convenient sampling method was used for the recruitment of cases and they were identified through Health Centres and Health Posts. The exclusion criteria were mothers who gave birth to their final child in a private clinic. Women who delivered at a health facility (hospital or Safe Delivery Posts) were categorized as controls (n=600) group. To increase the power of the study, two controls were chosen at random from the same health centres for each case. Written informed consent was obtained from the participants.

2.2. Data Collection

Data were collected using a 77-item semi-structured questionnaire. The questionnaire was created after a thorough examination of the literature. The questionnaire included 3 main sections: socio-demographic characteristics, birthing services-related factors and pregnancy-related factors. A trained research team member was assigned to complete the questionnaires during a face-to-face interview.

The content validity content ratio (CVR) and content validity index were calculated using comments from a panel of ten experts, including epidemiologists, maternal health experts, and obstetricians. Questions having a CVR of less than 0.62 were changed or eliminated (9).

2.3. Statistical Analysis

Counts and percentages were used to present categorical variables. Case and control characteristics were compared using chi square and Fisher's exact tests, if needed. To find the correlates of home delivery, a multiple logistic regression model was fitted using the forward likelihood ratio approach. All the variables significantly associated with home delivery at a significance level of less than or equals to 0.25 in the binary logistic regression models were included into the multiple logistic regression model. For all analyses, a P value of less than 0.05 was considered significant. For data analysis, SPSS version 20 (Chicago, IL) was employed.

3. Results

3.1. Socio-demographic characteristics of the study participants

In total, 900 subjects took part in the study (300 cases and 600 controls). The mean age of the cases and controls was 24.2 6.5 years and 26.65 years, respectively. The distribution of socio-demographic characteristics of cases and controls is shown in Table 1. A significantly greater proportion of controls (18.7% vs. 6.0%, P=0.001)

and their spouses (28.9% vs. 17.7%, P=0.001) had a high school or university degree. As compared with controls, a higher percentage of cases were women from Balouch ethnicity (96.0% vs. 92.1%, P=0.006). In comparison with cases, a higher percentage of controls had a good income (77.2% versus 70.3%, P=0.026), or had a health insurance (76.5% versus 39.0%, P=0.001).

In the cases group, a greater proportion of the mothers had the last say in choosing of the place of delivery (27.7% versus 3.3%, P=0.001). In terms of socio-demographic characteristics, the following

Table 1: Comparison of the socio-demographic characteristics of the cases (n=300) and controls (n=600), Zahedan, Iran

Variable	N	Cases		Controls		P value*
		%	N	%	N	
Age group (years)	< 18	38	12.7	34	5.7	0.001
	18-35	234	78.3	491	81.8	
	>35	27	0.9	75	12.5	
Age group at the first marriage (years)	<16	172	57.7	276	0.46	0.004
	16-20	86	28.9	214	35.7	
	>20	40	13.4	110	18.3	
Women education	Illiterate	156	0.2	163	27.2	0.001
	Primary /secondary school	126	0.42	325	54.2	
	High school and above	18	0.6	112	18.7	
Spouse education	Illiterate	95	31.7	116	19.4	0.001
	Primary /secondary school	152	50.7	309	51.7	
	High school and above	53	17.7	173	28.9	
Number of households (persons)	<= 5	149	49.7	304	50.7	0.777
	>5	151	50.3	296	49.3	
Occupation	Housewife	290	96.7	581	96.8	0.894
	Others	10	3.3	19	3.2	
Spouse occupation	Unemployed	45	15.1	90	15.2	0.549
	Worker	205	68.6	387	65.5	
	Self-employed	49	16.4	114	19.3	
Ethnicity	Baluch	288	0.96	547	91.2	0.006
	Others	12	0.4	53	8.8	
Household income status	Good	211	70.3	463	77.2	0.026
	Medium/poor	89	29.7	137	22.8	
Holding a National ID	Yes	133	44.3	468	0.78	0.001
	No	167	55.7	132	0.22	
Health insurance	Yes	117	0.39	459	76.5	0.001
	No	183	0.61	141	23.5	
Holding an active health profile	Yes	266	88.7	543	90.5	0.390
	No	34	11.3	57	9.5	
Final decision-making power on delivery place	Women only	82	27.4	20	3.3	0.001
	Spouse	217	72.6	580	96.7	
Place of residence	Urban	14	66.7	586	66.7	1.000
	Peri-urban	7	33.3	293	33.3	

*P value for Pearson's chi square test

Table 2: Comparison of the perceived birthing-services characteristics that can have an impact on the choice of place of delivery between the cases (n=300) and controls (n=600), Zahedan, Iran

Variable	N	Cases		Controls		P value*
		N	%	N	%	
Crowded and Noisy environment	Yes	125	41.7	222	37.1	0.181
	No	175	58.3	377	62.9	
worried about teaching environment of the hospital	Yes	147	49.0	214	35.7	0.001
	No	153	50.5	385	64.3	
Long waiting time for examination	Yes	68	22.7	113	18.9	0.185
	No	232	77.3	485	81.1	
Not having the right to choose the labour attendant	Yes	58	19.4	91	15.2	0.111
	No	241	80.6	508	84.8	
Lack of privacy	Yes	147	49.2	240	40.0	0.009
	No	152	50.8	360	60.0	
Inappropriate behaviour of service provider	Yes	144	48.0	217	36.2	0.001
	No	156	52.0	383	63.8	
Distrust in technical skills the birth attendant	Yes	113	37.7	224	37.3	0.922
	No	187	62.3	376	62.7	
Not paying attention to relieving pain	Yes	100	33.3	195	32.5	0.802
	No	200	66.7	405	67.5	
Fear of the hospital environment	Yes	163	54.3	212	35.3	0.001
	No	137	45.7	388	64.7	
Fear of unnecessary therapeutic interventions	Yes	166	55.3	274	45.8	0.007
	No	134	44.7	324	54.2	
Fear of hospital acquired infections	Yes	76	25.3	168	28.0	0.396
	No	224	74.7	432	72.0	
Fear of caesarean section	Yes	180	60.0	333	55.5	0.199
	No	120	40.0	267	44.5	
Financial constraints	Yes	179	59.7	266	44.5	0.001
	No	121	40.3	332	55.5	
Previous negative experiences	Yes	125	41.7	168	28.2	0.001
	No	175	58.3	428	71.8	
Having family responsibilities	Yes	102	34.0	116	19.4	0.001
	No	198	66.0	482	80.6	
Precipitate labour	Yes	121	40.3	162	27.0	0.001
	No	179	59.7	438	73.0	
Opposition of family members and friends	Yes	18	6.0	16	2.7	0.001
	No	282	94.0	584	97.3	

* P value for Pearson's chi square test

explanatory factors were found to be significantly linked to the choosing of the place of delivery: Age, age at the first marriage, level of education, level of husband's education, ethnicity, monthly income, holding a national ID, having health insurance, and the person who makes decision about the place of birth ($P < 0.05$).

3.2. Perception of birthing services-related factors

As presented in Table 2, more than 49% of participants who were worried about teaching

environment of the hospital were pregnant women who gave birth at home, while this proportion was 35.7% for patients with institutional deliveries ($P = 0.001$). In comparison with women in the group of institutional deliveries, those with home deliveries were more likely to express their concern about the lack of privacy (49.2% versus 40%, $P = 0.009$), inappropriate behaviour of service providers (48% versus 46.2%, $P = 0.001$), fear of the hospital environment (54.3% versus 35.3%, $P = 0.001$), fear of unnecessary therapeutic interventions (55.3% versus 45.8%, $P = 0.007$), and previous negative

Table 3: Results of multiple logistic regression analysis of the factors associated with the choice of home delivery

Variables		Adjusted OR	P value
		[95% C.I.]	
Level of education	Illiterate	3.8 [2.0-7.4]	0.001
	Primary /secondary school	2.3 [1.3-4.4]	0.007
	High school and above	Ref.	-
Final decision-making power on place of delivery	The woman	12.7 [7.0-22.8]	0.001
	The Spouse	Ref.	-
worried about teaching environment of the hospital	Yes	1.9 [1.3-2.8]	0.001
	No	Ref.	-
Negative experiences in the previous delivery	Yes	1.6 [1.0-2.4]	0.020
	No	Ref.	-
Health insurance	Yes	Ref.	-
	No	5.1 [3.5 -7.4]	0.001
Financial constraints	Yes	1.7 [1.2-2.4]	0.003
	No	Ref.	-
Precipitate labour	Yes	2.7 [1.8-3.9]	0.001
	No	Ref.	-
Fear of the hospital environment	Yes	1.6 [1.1-2.4]	0.020
	No	Ref.	-

experiences (41.7% versus 28.2%, $P=0.001$) with giving birth in hospitals. A higher proportion of financial constraints (59.7% versus 44.5%, $P=0.001$), having family responsibilities (34% versus 19.4%, $P=0.001$), precipitate labour (40.3% versus 27%, $P=0.001$), and opposition of family members and friends (6% versus 2.7%, $P=0.001$) was observed in the group of pregnant women who gave birth at home, as compared with those with hospital deliveries.

3.3. Factors predicting home delivery

A multiple logistic regression analysis was used to find characteristics that influence the likelihood of a home delivery. Table 3 shows factors that are independently linked to the likelihood of giving delivery at home. According to adjusted odds ratio (AOR) in the multiple regression model, illiterate women and those with primary/secondary education were about 3.8 [AOR= 3.8, 95% C.I.: 2.0 -7.4], and 2.3 times [AOR 2.3, 95% C.I.: 1.3 - 4.4] more likely to deliver at home than those having a high school and above degree, respectively. Women who made independent decision on choosing the place of delivery were more likely to deliver at home as compared with the subjects who reported that their husband choose the delivery place [AOR=12.7, 95% C.I.:7.0 - 22.8]. Women who were worried about giving birth at a teaching hospital, subjects with a negative

experience in the previous delivery, women without health insurance, participants with financial constraints were 1.9 [AOR= 1.9, 95% C.I.:1.3-2.8], 1.6 [AOR= 1.6, 95% C.I.:1.0-2.4], 5.1 [AOR= 5.1, 95% C.I.: 3.5 - 7.4], and 1.7 times [AOR= 1.7, 95% C.I.:1.2 - 2.4] more likely to deliver at home, respectively. Also, women who had precipitate labour were 2.7 times more likely to deliver at home than those who did not have precipitate labour [AOR= 2.7, 95% C.I.:1.8-3.9]. Women who were fearful of the hospital environment were 1.6 times more likely to deliver at home than those who were not fearful of the hospital environment [AOR= 1.6, 95% C.I.:1.1- 2.4].

4. Discussion

This study was conducted to determine the factors that were linked to home deliveries in pregnant women following the execution of Iran's Health Transformation Plan. Based on the findings of this study, teaching hospital, previous negative experiences, health insurance, person who makes decision on place of birth, financial problems, level of education, precipitate labour and fear of the hospital environment were determined as the determinants of delivery location. The results of this study showed that mother's education is one of the key factors in determining pregnant women's use of delivery services. This finding is consistent with various studies conducted in Nepal (10) and Ethiopia (11). Low

educational level and failure to empower women prevents them from seeking health care and giving childbirth in delivery units (12). The autonomy of women seeking health care for themselves and their children is highly likely to increase as their education level rises. Higher levels of education can also result in a better socio-economic status (11, 12). Both of these factors in turn, result in better health awareness and improved educational opportunities for women, especially in rural areas, which increase the likelihood of choosing the quality healthcare services provided by various facilities. Higher levels of education can have a significant impact on decreasing maternal mortality, even in countries where women have a weak influence on decision making (13).

The results of this study indicated that when the mother herself is the main decision maker the chance of home delivery is high. This finding is in line with research carried out in Iran (14), Thailand (15), and Bolivia (16). Other studies emphasize the role of friends, relatives and spouses in choosing the place of delivery (17). Despite participating in negotiations and receiving counselling regarding labour preparation and delivery location, pregnant women are generally reliant on their husbands to make the final decision (18). The main reasons that the pregnant women avoid delivery in childbirth units include: the low socio-economic status of women and their dependence on their husbands for financial resources (18), and the problems of access to transportation, lack of accompanying person, and the feeling of embarrassment and shame for delivery in front of the others (14).

In the current study, pregnant women reported precipitated labour as a reason for delivery at home. This has been repeatedly reported as one of the causes for home deliveries (19). For instance, the results from studies conducted in Ethiopia (20), and Uganda (21), showed that precipitated labour with lack of transportation, was an important contributor to underutilization of services provided by delivery facilities. In several studies, it has been stated that many pregnant women plan for delivery in delivery units, but the sudden onset of labour or the difficulty in identifying labour pain limits the choice of delivery place (19, 22). Knowledge and awareness of couples about the symptoms of labour and their fast referral for receiving medical care, and having preparation for childbirth (such as saving money) through adequate training for women,

especially during pregnancy care, can reduce the likelihood of home deliveries following precipitate labour (19, 23).

The findings of this study revealed that a pregnant woman's economic status and financial constraints play a significant role in her decision to seek hospital care and use of institutional delivery services. This finding is consistent with similar findings from other studies conducted in Indonesia (24) and Kenya (25). Most of the women are housewives, have limited access to resources and, at the same time, have no decision-making power in matrimony life, and cannot pay delivery costs in a private clinic or even in a public hospital (26). Therefore, many women have no option except choosing delivery at home. Although pregnancy and maternity care services are free-of-charge in many countries, but some pregnant women with inappropriate income sources, cannot pay for transportation and unexpected treatment costs (27). In many developing countries, policymakers have focused on the implementation of the national cash transfer program in order to improve the access of women to health services, and to reduce fairly high public and private delivery costs (28). These plans not only results in increasing the use of health services in women, but also reduces the economic and social inequality in the use of medical care.

The present study showed that the lack of health insurance coverage can increase the chance of delivery at home. This finding is in agreement with the studies conducted in Kenya (25), and Iran (29). In 2014, in an effort to provide health care for women and children in the country, especially in underprivileged areas, the Iranian government introduced the National Health System Transformation Plan to improve women's access to healthcare and maternity services (8). The Iranian Ministry of Health launched free-of-charge vaginal delivery services in all public hospitals and rural safe delivery units. However, in Zahedan in implementation of this program, the health authorities were facing two problems. First, on the one hand, some women and families residing in the outskirts of the city had no information about this program, and second, a number of women had no national ID cards and therefore they were not eligible for free-of-charge delivery services. It has been suggested that implementing programs such as tax exemptions for poor pregnant women (those without a national ID card, those with a large household size, and those with inadequate financial resources), and having

some strategies to reduce the financial obstacles for receiving pregnancy emergency care, such as insurance discounts, are necessary to improve the access of those who need the most to those services (29). However, the provision of health insurance may not be sufficient to compensate the difference in the socio-economic cost of delivery (30). Despite the availability of financial resources, socio-cultural factors can cause some barriers and limitations in the use of healthcare services (29). Therefore, decision makers and politicians need to adopt some approaches to increase the number of deliveries in childbirth units and have some policies to address the socio-economic barriers (30).

The present study showed that the fear of pregnant women from teaching hospitals increases the chance of delivery at home. According to the previous studies, the routine medical care in teaching hospitals can lead to unnecessary interventions and an increase in the incidence of complications associated with normal vaginal deliveries in hospitals (31). In order to address these issues in Iran, some measures have been undertaken with the involvement of skilled healthcare professionals along with the implementation of appropriate interventions for managing complications, leading to a significant improvement in maternal and neonatal mortality due to childbirth (32). For example, establishment of places for delivery, such as safe delivery facilities, using a small team of experienced midwives that decreases the possibility of the need for unnecessary medical interventions, with an increase in women's self-esteem and improving their tendency toward natural vaginal delivery have resulted in a significant decrease in home deliveries in outskirts of Zahedan, southeast Iran (32).

The present study indicates that past negative experiences of pregnant women with hospital services increases the chance of delivery at home, which is consistent with findings from studies conducted in Zambia (18) and Laos (22). Studies showed that personal experiences of pregnant women and also those accompanying them, including close relatives who have had technical and ethical negative experiences in receiving hospital services during pregnancy and previous childbirths, may influence their views about giving delivery in the hospital for future deliveries (33). It has been well established that those negative experiences are strongly associated with the loss of independence of women and their autonomy in choosing hospitals as a place of delivery (34). The

more healthcare services delivered by birthing units meet the cultural, social, and religious needs of patients and their families, the more likely it is to be used by the people the services have been planned for them (33, 35).

The fear of pregnant women from hospitals environment increases the chance of delivery at home, which is in line with the results of a study conducted in Bangladesh (36). Most of the women are afraid of hospitals because of lack of privacy, unfamiliar surroundings, and fear of unknown medical procedures (26). Some of these fears and lack of confidence were also found to be the case among our study participants that lead them to choose to deliver at home.

One of the important strengths of this study was a response rate of 100% in both cases and the controls. For data collection, a face-to-face interview with a semi-structured questionnaire was employed, which increased the quality of the data gathered. However, recall bias could be a potential weakness of this study due to the research method adopted. We did, however, collect data from the most recent delivery within six months of the survey to reduce the women's potential recall bias. The smaller sample size in the categories for some variables generated large confidence intervals, resulting in less reliable findings. As a result, such findings should be interpreted with caution.

5. Conclusions

Although, the Health Transformation Plan and other public health intervention have resulted in an increase utilization of maternity services, but still there are some barriers to institutional deliveries in the underprivileged areas. Social and economic empowerment of women, through a multi-sectoral approach and an increase in the level of education and raising the awareness about the benefits of safe delivery in the delivery facilities are necessary. Those interventions need to be complemented by improving health insurance coverage, especially for women who do not have a national ID card, cash subsidies (e.g. in the form of a Conditional Cash Transfer Program) for pregnant women who have financial problems.

Ethical approval

The ethical approval for this study was obtained from Ethics Committee of Zahedan University of Medical Sciences with the code of IR.ZAUMS.REC.1395.265.

Conflict of Interest: None declared.

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