Knowledge of Prenatal Healthcare among Pregnant Women in Boyer-Ahmad and Dena County of Kohgiluyeh and Boyer-Ahmad Province, Iran

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Abstract

Introduction and objective: Prenatal care knowledge is critical for pregnant women's use of antenatal services. The aim of the study was to assess the extent of prenatal healthcare knowledge among pregnant women of the Boyer-Ahmad and Dena County of Kohgiluyeh and Boyer-Ahmad Province, Iran.

Methods: A cross-sectional survey was conducted between April and June 2013. Pregnant women who came for delivery to the only available public hospital were interviewed by trained research assistants. Interview questions were designed to assess their knowledge on five broad categories of prenatal care practices of immunization, diet, supplementation, antenatal checkups and warning signs. Collected information was converted into numerical scores and average score for each individual was calculated. Independent-samples *t*-test, analysis of variance and multiple comparison tests were used to compare scores among groups with different demographic and socioeconomic status. **Results:** A total of 400 pregnant women with 66.8% illiterate or lowly educated and an average age of 28.5 ± 6.1 years participated in the study. The average care knowledge score was 16.8 out of a maximum of 30. The highest awareness was observed on immunization (54.4%) and the lowest for prenatal checkup (20.3%).The average knowledge scores were significantly different among age groups, educational level, number of gravidity, type of occupation, place of residence and time of starting of prenatal care. There were no significant differences between women with and without obstetric complications. **Conclusion:** Not surprisingly, the level of education was the most significant factor influencing women's knowledge of parental healthcare, reinforcing the need for the improvement in literacy and expansion of health education among pregnant women using various educational methods.

Introduction

About 800 women die from pregnancy or childbirth-related complications around the world every day. In 2013 alone, 289,000 women died during pregnancy or at childbirth. In developing countries, maternal mortality is a significant public health issue, with a mortality rate of 230 per 100,000 live births versus 16 per 100,000 in developed countries. Almost all maternal deaths (99%) occur in developing countries (WHO 2014), with large disparities between countries, and between women with high and low income and those living in rural and urban areas.

Maternal health improvement was adopted as the eight Millennium Development Goals (MDG5) of the international community in 2000. Under MDG5, countries committed to reducing maternal mortality by three-quarters between 1990 and 2015. Since 1990, maternal deaths worldwide have dropped by 45% (WHO 2005). In Iran, maternal death has declined from 83 in 1990 to 19 in 2015 (WHO et al. 2015). However, the global maternal mortality ratio declined by only 2.6% per year during the same period, far from the annual decline of 5.5% required to achieve MDG5 (WHO 2014).

In order to achieve this goal, all women need to have access to high-quality prenatal care, including medical and nursing care recommended for women during pregnancy and regular checkups to detect as well as treat potential health issues that may arise during pregnancy (WHO 2005). Lack of prenatal healthcare has been identified as one of the risk factors for maternal mortality and other adverse pregnancy outcomes in developing countries (Anandalakshmy et al. 1993; Fawcus et al. 1996). Women who receive prenatal healthcare have lower rates of maternal and infant mortality, as well as better pregnancy outcomes (De Brouwere et al. 1998). Health knowledge is considered as one of the key factors that enable women to be aware of their rights and health status to seek appropriate health services. Knowledge on prenatal care is critical in determining

pregnant women's use of antenatal services. Moreover, studies have shown that adequate knowledge of prenatal care has a positive and statistically significant effect on prenatal care use (Nisar and White 2003; Paredes et al. 2005; Simkhada et al. 2008).

The objectives of the study were to assess the extent of the prenatal healthcare knowledge among pregnant women of Boyer-Ahmad and Dena County, identify the contributing factors and provide a framework for further maternal health education. The Boyer-Ahmad and Dena counties were selected because no previous study was conducted and nearly half of the province population live in these two counties. Boyer-Ahmad is the largest and most populated county of the Kohgiluyeh and Boyer-Ahmad province, with a population of 243,771 and 58,281 households based on the 2011 census. The number of 10–49-year-old women is reported to be 50,527, with a population growth rate of 2.18 and a total fertility rate of 2.2 in 2013-2014. The Dena County population was reported to be 52,242, with 11,117 households (Census of the Islamic Republic of Iran 2011). The number of 10–49-year-old women is reported to be 7,454, with a population growth rate of 1.77 and a total fertility rate of 2.18 in 2013–2014 (Census of the Islamic Republic of Iran 2011).

Methods

A cross-sectional survey was conducted between April and June 2013.The target population were all pregnant women who were referred to the labour and delivery floor of Imam Sajjad Hospital for delivery, the only available public labour ward. This hospital covers about 94% of delivery and birth services of these two counties (Medical Deputy of YUMS 2013).

We chose to obtain our sample population from a public hospital where all women, regardless of socioeconomic status, can receive equal care and covers majority of pregnant women. We did not include women who were referred to two other hospitals in this area, one private and the other semipublic, which covered only 6.3% (592) of deliveries, mostly (98%) in elective caesarean section (Medical Deputy of YUMS 2013).

All the pregnant women who came for delivery during the study period were recruited and informed about the aim of the study. A questionnaire consisting of two parts (socio-demographic and prenatal healthcare knowledge information) was administered by the trained research assistants. Demographics information included age and place of residence, education and occupation status as well as state of previous and current pregnancies. The knowledge section consisted of 15 multiple-choice questions. The questions were designed to assess their knowledge about five broad categories of prenatal care practices; immunization (two questions), diet (four questions), supplementation (three questions), antenatal checkups (four questions) and warning signs (two questions). The content of the questionnaire, which was based on the materials used by the local health system, was explained to women for the sake of clarification.

The percentages of correct answers were calculated to determine the extent of their knowledge in each category. The answers were also converted into a scores ranging from 0 to 2 (0 indicated an incorrect answer, 2 indicated a correct answer and 1 indicated answer choices that could apply in some situations). After assigning each response a score, the average score for each individual was calculated.

The data were analyzed using the statistical package for social sciences (SPSS) version 22. Independent *t*-test, analysis of variance, multiple comparison and chi-square tests were used to compare scores between subgroups of demographics and socioeconomic status. A p-value of ≤ 0.05 was considered significant.

Results

The average age of 400 pregnant participant women was 28.44, with a standard deviation of 6.04, and ranged from 14 to 50 years.

The average prenatal healthcare knowledge score was 16.8 out of a maximum of 30. The highest percentage of awareness was observed for immunization (54.4%) and the lowest for the prenatal checkup (20.3%; Table 1).

Table 1. Pregnant women awareness for different categories of parental care knowledge

Maternal practice	Awareness (%)
Immunization	54.5
Diet	41.2
Supplement	50.5
Antenatal checkups	20.3
Warning sign	40.0

Urban women awareness was higher than rural for all domains, with the exception of warning sign (Table 2). Socio-demographic characteristics of the participants are presented in Table 3. A majority (56.8%) belonged to the 20–29-year age group, 77.7% were housewives, 37.3 % were illiterate and 32.7% were primigravida. More than half (52%) were urban residents and 65.2% have started prenatal care visit during the first trimester. Only 4.8% of the participants had post-secondary education.

Table 2. Pregnant urban and rural women awareness for different categories of parental care knowledge

Maternal practice	Awareness (%)		*p*-value
	Urban	Rural	
Immunization	73.3	26.7	0.00
Diet	52.6	47.4	0.30
Supplement	56.9	43.1	0.03
Antenatal checkups	54.4	45.6	0.03
Warning sign	42.9	57.1	0.20

Table 3. Mean, standard deviation and significance level of pregnant women knowledge score for demographic and prenatal care practices

Variables	Freq. (%)	Mean ± SD	Sig.
Age (years)			0.001
<20	17 (4.2)	16.8 ± 3.0	
20–29	227 (56.8)	17.1 ± 2.4	
30–39	136 (34.0)	16.5 ± 2.5	
≥40	20 (5.0)	14.8 ± 3.4	
Gravidity			0.020
1	131 (32.7)	17.09 ± 2.3	
2	109 (27.3)	17.1 ± 2.3	
≥3	160 (40.0)	16.3 ± 2.9	
Education			0.030
Illiterate	149 (37.3)	16.4 ± 2.8	
Primary school	118 (29.5)	16.8 ± 2.4	
High school	114 (28.4)	17.2 ± 2.5	
Post-secondary	19 (4.8)	17.2 ± 1.8	
Place of residence			0.018
Rural	192 (48.0)	16.6 ± 2.7	
Urban	208 (52.0)	16.9 ± 2.5	
Occupation			0.004
Civil servant	32 (8.0)	16.7 ± 2.4	
Health professionals	57 (14.3)	17.8 ± 2.4	
Housewife	311 (77.7)	16.6 ± 2.6	
Husband occupation			0.40
Unemployed	29 (7.3)	17.3 ± 2.6	
Worker	37 (9.3)	16.8 ± 3.0	
Civil servant	95 (23.8)	17.2 ± 2.1	
Personal business	239 (59.8)	16.6 ± 2.5	
Time of first prenatal visit			0.001
Preconception	75 (18.8)	17.6 ± 2.4	
First trimester	260 (65.2)	16.8 ± 2.5	
Second trimester	32 (8.0)	15.7 ± 3.2	
Third trimester	10 (2.5)	14.8 ± 2.4	
Never	22 (5.5)	15.9 ± 2.5	
Pregnancy status			0.27
Without complication	320 (80.0)	17.08 ± 2.4	
With complication	80 (20.0)	16.7 ± 2.6	

Freq. = frequency; Sig. = significance level.

The average knowledge scores were significantly different among age groups, education status, gravidity, occupation, place of residency and time of starting of prenatal care (Table 3). However, there was no significant difference between knowledge score of women with and without obstetric complications.

Using multiple comparison tests, significant differences were found between women older than 40 and 20–29-year-old ($p \leq 0.001$) and 30–39-year-old ($p \leq 0.030$) age groups, primigravida and multigravida ($p \leq 0.045$), illiterate and tertiary level of education ($p \leq 0.020$) and housewives with health professionals ($p \leq 0.002$). There were also significant differences in the average knowledge score between women who have started prenatal visit during preconception period and women who have started during second trimester ($p \leq 0.005$) and third trimester ($p \leq 0.01$) of pregnancy.

Demographic characteristics and prenatal care knowledge of rural and urban pregnant women are presented in Table 4. Pregnant women with age less than 20 and greater than 40 (high-risk age group) were more frequent in rural than urban. Younger women (<20 years old) were in majority in the rural category, while women in 40 and older age group were in minority. Significant age group difference was found in knowledge score among rural women. While women illiteracy was higher in rural women, tertiary education was higher in urban women. The percentage of civil servants and health professional was significantly higher among urban than rural women. The rate of preconception visit was significantly higher in urban women than rural and their knowledge level was higher than both rural and urban women who had their first preconception visit.

Discussion

Prenatal care has long been considered a basic component of any reproductive healthcare program. In this study, the average prenatal healthcare knowledge score was 16.8 out of a maximum of 30. This can be attributed to the fact that about two-thirds of women were either illiterate or with primary school education. Urban women had a significantly higher average total parental care knowledge score than their rural counterparts (Table 3) due to higher literacy rate.

Not surprisingly and in agreement with other studies (Kishk 2002; Ohnishi et al. 2005; OnasogaOlayinka et al. 2012; Riazi et al. 2012; Sharma and Sharma 2012; William et al. 2008), education was found to be the most important factor affecting prenatal care knowledge. Knowledge not only transforms, but also empowers women and improves their self-esteem (Renkert and Nutbeam 2001). It is expected that educated women are more likely to be aware of their health status and seek health information. Furthermore, educated women may have a greater decision-making power on health-related matters.

The prenatal care knowledge score was decreased, as women got older, particularly in rural women. The highest score was recorded for the 20–29-year-old age group. However, differences among age groups were statistically significant only between those aged 40 and higher and 20–29 and 30–39-year-old age groups. In rural women, the highest score was recorded for those with age group under 20 years, suggesting some improvement in recent years. Other studies also reported significant age effect (French et al. 2003; Wu et al. 2007).

The prenatal care knowledge score was significantly lower for women with three or more pregnancies than other groups. This difference was more obvious in rural women. This might be due to lower educational level and higher gravity score in this group compared with the younger women. The lack of adequate prenatal healthcare knowledge among older women and multigravidas may be due to non-attendance at antenatal care and/or insufficient information received in the previous pregnancy. Women without basic education are more likely to acquire

information on pregnancy from friends and relatives, which often make them to believe that their prenatal health knowledge is adequate. However, their "knowledge" might be traditional beliefs and habits. Several studies have reported a negative association between gravidity and prenatal care (Riazi et al. 2012; Qi Zhao et al. 2009; William et al. 2008).

Table 4. Mean, standard deviation and significance level of urban and rural pregnant women knowledge score for demographic and prenatal care practices

Variables	Urban			Rural			X^2 test and sig. of comparing freq. (%) of variables
	Freq. (%)	Mean ± SD	Sig.	Freq. (%)	Mean ± SD	Sig.	
Age (years)			0.4			0.001	$X^2 = 10.1$; df =3; $p = 0.01$
<20	7 (3.4)	16 ± 0.3		10 (5.2)	17.4 ± 2.8		
20-29	134 (64.4)	17.1 ± 2.5		93 (48.7)	17.12 ± 2.4		
30-39	59 (28.4)	16.6 ± 2.4		76 (39.8)	16.3 ± 2.6		
≥40	8 (3.8)	16.7 ± 2.1		12 (6.3)	13.5 ± 3.5		
Gravidity			0.5			0.002	$X^2 = 8.8$; df = 2; $p = 0.01$
1	7 (37)	16.8 ± 2.3		53 (27.8)	17.5 ± 2.2		
2	62 (29.8)	17.2 ± 0.3		47 (24.6)	16.9 ± 2.1		
≥3	69 (33.2)	16.9 ± 2.6		91 (47.6)	15.9 ± 3.07		
Education			0.02			0.02	$X^2 = 24.9$; df = 3; $p = 0.001$
Illiterate	55 (26.4)	16.2 ± 2.7		94 (49.2)	16.5 ± 2.9		
Primary school	68 (32.7)	17 ± 2.5		50 (26.2)	16.6 ± 2.1		
High school	26 (12.5)	16.8 ± 2.3		20 (10.5)	16.5 ± 2.3		
Post-secondary	59 (28.4)	17.7 ± 2.1		27 (14.1)	17.1 ± 3.2		
Occupation			0.04			0.1	$X^2 = 23.7$; df = 2; $p = 0.001$
Civil servant	21 (10.1)	17.7 ± 2.5		11 (5.8)	16.3 ± 2.2		
Health professionals	45 (21.6)	17.7 ± 2.2		12 (6.3)	18.2 ± 2.3		
Housewife	142 (68.3)	16.7 ± 2.5		168 (87.9)	16.5 ± 2.7		
Husband occupation			0.6			0.3	$X^2 = 15.2$; df = 3; $p = 0.002$
Unemployed	24 (11.5)	17.08 ± 2.6		5 (2.6)	18.6 ± 2.7		
Worker	52 (25)	17.2 ± 2.7		43 (22.5)	16.3 ± 3.2		
Civil servant	22 (10.6)	17.3 ± 2.2		15 (7.9)	17.0 ± 1.9		
Personal business	110 (52.9)	16.7 ± 2.4		128 (67)	16.5 ± 2.6		
Time of first prenatal visit			0.02			0.02	$X^2 = 21.1$; df = 4; $p = 0.001$
Preconception	55 (26.4)	17.7 ± 2.5		20 (10.5)	17.4 ± 2.16		
First trimester	115 (55.6)	16.9 ± 2.3		145 (75.9)	16.7 ± 2.6		
Second trimester	19 (9.2)	16.3 ± 2.6		13 (6.8)	14.9 ± 2.2		
Third trimester	5 (2.4)	15.0 ± 2.9		4 (2.1)	14.2 ± 2.7		
Never	13 (6.3)	16.0 ± 2.5		9 (4.7)	15.8 ± 2.6		
Pregnancy status			0.5			0.04	$X^2 = 2.48$; df =1; $p = 0.07$
Without complication	160 (76.9)	17.0 ± 2.4		159 (83.2)	16.4 ± 2.8		
With complication	48 (23.1)	16.7 ± 2.6		32 (16.8)	17.5 ± 2.1		

Freq. = frequency; Sig. = significance level.

The average prenatal healthcare knowledge scores were lower for housewives than employed women, particularly for health professionals with higher educational status. The percentage of civil servants and health professionals in urban women was significantly higher than rural women due to their higher basic formal education. While knowledge score difference for occupation was significant for urban women, it was not significant for rural women. Similar studies in Iran found employment to be a significant factor and majority of the women with low prenatal healthcare knowledge score to be housewives (Riazi et al. 2012).

Most of the pregnant women had their first visit during the first trimester of pregnancy. Women with lower average prenatal healthcare knowledge score started their prenatal care at the second trimester of pregnancy and later. It is recommended that all expectant mothers receive prenatal care training before and during the first trimester of pregnancy. The initiation of prenatal care during training and education during the first trimester of pregnancy allows for timely diagnosis and treatment of numerous health issues (Villar and Bergsjo 2003). This study confirmed that the utilization of prenatal healthcare service among women with sufficient knowledge about the benefits of prenatal healthcare during pregnancy was higher than among women lacking such knowledge, in agreement with other studies (Diego et al. 2009; Kulkarni and Nimbalkar 2008; Mahajan and Sharma 2014; Yang et al. 2007).

Women who initiated prenatal care before their pregnancy were second in the total frequency ranking, both in rural and urban, but the rate of preconception visit was significantly higher in urban women than rural women (Table 4). Furthermore, they had the highest knowledge score and their average knowledge score about prenatal healthcare was significantly higher than women who initiate prenatal care during the second trimester and later. Preconception health knowledge means knowing how health conditions and risk factors could affect women and their unborn babies at pregnancy. New WHO report shows that preconception care has a positive impact on maternal and child health outcomes. Preconception care is the provision of biomedical, behavioural and social health interventions before conception occurs. Preconception care aims at improving women health status, and reducing behavioural and environmental factors that contribute to poor maternal and child health outcomes. Its ultimate aim is to improve maternal and child health, in both the short and long term (WHO 2013).

In this study, we chose to obtain our sample population from a public hospital. We did not include women who referred to two other hospitals in this area, one private and the other semipublic. This might be a source of bias, given that this group had a higher socioeconomic status and perhaps higher prenatal healthcare knowledge. Furthermore, our results might not be representative of the whole province, given that a cross-sectional survey was conducted in only one area. Further broad-based studies with larger sample size are needed to confirm these findings.

Iran's approach to family planning policies has changed during the past few years. After authorities and policymakers suggested the need for population increase, the Supreme Leader stated that family planning policies should be ceased. In July 2012, the budget for family planning was reduced drastically and women were encouraged to have three children by the age of 30. At present, public access to free contraceptives is not banned; however, it is restricted to a great extent. It is not clear what impact the change in family planning policy will have on prenatal care.

Conclusion

Based on our findings, educational status plays a very significant factor in the

understanding of the importance of prenatal care knowledge. The main factor was the lower formal education particularly in rural women and higher age and gravidity of both rural and urban women. This finding suggests the need for a targeted health education using various educational methods for pregnant women. Women should be aware of the importance of prenatal care to proactively prepare for pregnancy and seek care early. Healthcare providers, educators and policymakers can use these insights to develop strategies and assess health service needs of pregnant women. Furthermore, the risk of an education gap between rural and urban areas is real. Despite the fact that education is a basic right in itself and essential for improving the living conditions of both rural and urban populations, adult illiteracy is much higher and quality of education is poorer for rural people. To address this challenge, more rigorous and scientific approaches are needed for building awareness about the importance of education to overcome the urban/rural education gap through access to basic education, improvement of basic education quality through design and implementation of basic education plans.

Acknowledgements

The research proposal was approved by the Research Committee of Yasuj University of Medical Sciences. The authors thank Yasuj University of Medical Sciences and the staff of the labour ward of Imam Sajjad Hospital for their support.

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