ORIGINAL ARTICLE

Relationship between Type of Prenatal Care Provider and Neonatal Outcomes in Shiraz, Iran

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ABSTRACT

Background: Prenatal care is one of the most essential services provided by the health system in every country worldwide. In Iran, prenatal care providers include behvarzes, midwives, family practitioners, and gynecologists.

Aim: To determine the relationship between type of care provider and neonatal outcomes in Shiraz-Iran.

Methods: In this cross-sectional study, data were collected from Shiraz Medical Sciences Hospitals in Iran from Oct 2017 to Jan 2018. The information was collected by checking the hospital records of 397 women who had a single low risk pregnancy. The neonatal outcomes included the age of fetus at birth, and neonatal weight, height and head circumference.

Results: Findings showed that 44.85% of pregnant women had selected gynecologists as their pregnancy care providers. 31.23% of women had selected more than one prenatal care provider. The average age of fetus at birth was (38.65±1.485 weeks) for the gynecologists group. This value was significantly different from groups who had selected other prenatal care providers (P=0.015). There was no significant difference between the type of care providers and neonatal weight (P=0.676), height (P=0.156), and head circumference (P=0.479).

Conclusion: It can be claimed that the right choice of pregnancy care provider, can lead to the proper use of human resources and reduce the cost of care. Consequently, with education of low risk pregnant women for choosing provider can be prevented negative outcomes that effect on the neonate, mother, family and health system and helped to pregnant women experience pleasant pregnancy period.

Keywords: Family practitioner, Gynecologist, Iran, Midwife, Neonatal outcomes, Prenatal care.

INTRODUCTION

Prenatal care programs have been implemented in high, low, and middle-income countries for several decades[1]. The objective of prenatal care is surveillance and improvement of maternal and fetal health; the diagnosis of complications; resolving of women's problems, the preparation for childbirth, and promotion of healthy behaviors. In conditions that regular prenatal care is accomplished, providers are able to identify the risk factors in order to prevent maternal and neonatal health outcomes for the reduction of their mortality[2,3].

Prenatal care is one of the most important services provided by the health system in every country worldwide[4]. The Ministry of Health and Medical Education in Iran has developed a comprehensive maternity care program including examination, personal health, education of risk symptoms, food and drug supplements and reproductive health services[5]. According to the World Bank Human Development Report in 2010, the coverage of prenatal care in Iran rated as 96.4%[6].

In Iran, both public and private sectors provide prenatal care[7]. In urban areas, midwives and gynecologists provide maternity care to pregnant women are supervised by family practitioners[8,9,10]. In rural areas, behvarzes carry out prenatal care programs according to the national guidelines in health houses. They are local residents that have a secondary education plus two years of primary health care training[11,12]. Shiraz, the capital of Fars province, is a special pilot area in the southwestern part of Iran which has implemented the urban family practitioner program[13]. According to the guidelines of this program, the family practitioner is a general physician who is responsible for providing prenatal care to the low risk pregnant women[14]. Furthermore, behvarzes, midwives, family practitioners and gynecologists are groups which have educated for providing prenatal care. So far, midwives and gynecologists have acquired more specialized skills[15]. The time period for acquiring bachelor's degree in midwifery field is four years in Iran. Therefore, the graduates are able to provide health care programs to mothers and infants[16]. These groups provide care facilities according to the national guidelines for the provision of midwifery services issued by the Ministry of Health and Medical Education in Iran[17]. Gynecologists can take care of low-risk and high-risk pregnant women while rest of them provide care for low-risk pregnant women.

It is optional to choose pregnancy care providers in Iran. In other word, pregnant women can freely decide whom to choose[18]. Although, about 80 percent of the pregnancy cases are regarded as low risk factors[15] but relevant studies have shown that pregnant women in Iran mostly refer to the gynecologists[18,19]. This is while, midwives are the first providers of maternity care services

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all around the world[20] and act as an important communicative circle between the community of family members and health care teams by providing health services to women[21].

Some studies have shown that there is no relationship provide between prenatal care type of providers and some of the neonatal outcomes. Voon et al. observed no difference for the low birth weight between the midwifery-based and gynecologists-based care groups in Singapore[22]. In the Wernham study accomplished in New Zealand, there was no relationship between midwifery-based care and physician-based services with fetus of small for gestational age[23]. However, some studies have shown that pregnant women who received midwifery care services, experienced fewer premature births in cases of family physician-based or specialist-based models[24,25].

Considering the findings of implemented studies about the relationship between the type of provided care and neonatal outcomes; there appeared controversial results indicating the absence of any relationship in this area. Meanwhile, no research was implemented studying the relationship between weight, height, and head circumference of the neonates with the type of pregnancy care providers in Iran. Thereupon, researchers decided to accomplish a comparative survey about the neonatal outcomes among women who received care services from various prenatal care providers in shiraz- Iran. Their premium objective was to represent the results to the planners and responsible authorities in health system in order to improve the relevant care support for low risk pregnant women.

METHODOLOGY

The present cross-sectional study was performed in hospitals affiliated by Shiraz University of Medical Sciences in Iran. The data were collected from three selected educational hospitals in South-East, North-West and Shiraz centers during the period of October 2017 and January 2018.

The sample size was calculated by referring to the research universe based on Cochran formula in order to estimate the uncertain size of the population as 384 pregnant women (α=0.05, Z=1.96, d=0.05, p=(1-p) =q=0.5). Then it was increased to 422 participants by the probable reduction of 10%. Henceforth, 25 individuals were excluded from the sample during the study and finally 397 participants were remained for the survey. Therefore, random sampling was carried out during four consecutive months in three educational hospitals by considering proportionate allocation based referrals. For data collection, following the permission letter from Shiraz University of Medical Sciences, the researcher was daily referred to these hospitals. Data gathering forms were completed based on maternity records and prenatal care questionnaire form. Iranian women, who had experienced low-risk pregnancy and had a term single fetus with cephalic presentation, entered this study. All participants signed the consent form before partnership. To identify the low risk pregnant women, the researcher applied national guideline of midwifery and childbirth care services of the Iran's Ministry of Health and Medical Education.

Data were collected by a form that consists of two parts; the first section included personal and family characteristics of mothers and the second one was related to the neonatal outcomes including gestational age, and baby's weight, height, head circumference at birth which were selected as dependent variables in this study.

The age of baby at birth was defined by the last period of normal menstruation and it was approved during the first three months by applying ultrasound digital device. The neonatal weight was measured by applying a baby weighing scale on the first day of their birth. The accuracy of measurement was checked by using standard calibration stone before each sequence of scaling. Height of the infants was measured and precisely recorded by using the horizontal measuring board in supine position with flat legs While the buttocks, shoulders and occiput were in contact with horizontal measuring board. Head circumference was measured by a non-stretchable measuring tape. The tape was wrapped around the widest circumference - from the most prominent point of the occipital bone to the most prominent frontal point. Height and head circumference were measured with the precision of one millimeter and the weight was measured by the precision of 10 grams.

In this study, prenatal care providers were considered as independent variable. In order to achieve the goals of this study, providers were categorized into groups of behvarzes, midwives, family practitioners, gynecologists and a combination of them.

Statistical analysis was performed using SPSS software version 21. The statistical method used to analyze the research questions was descriptive statistics (frequency, mean and standard deviation) and analytical statistics (one-way ANOVA, Kruskal-Wallis test and Chi-square test). The significance level was considered to be 0.05.

Ethical considerations: This study was approved with the code of IR. SBMU.PHNM.1396.843 by the committee of ethics in Shahid Beheshti University of Medical Sciences, Tehran, Iran. Before commencing the study, formal permissions for attending the study settings were secured from Shahid Beheshti University of Medical Sciences, Tehran and Shiraz University of Medical Sciences, Iran. All participants were informed about the aim of this study. Finally, they signed the informed consent form of the study.

RESULTS

In this study with 397 women, the mean and standard deviation of women's age was 28.8±5.9 and their husbands were 33.4±6.3 years. 31.2% of women had two or more providers to receive their prenatal care (Figure 1). The total mean and standard deviation of neonatal age at the time of birth was 38.8±1.52 years. Socio-demographic and obstetric characteristics was represented in Table 1.

The chi-square test showed a significant difference between the type of care provider with maternal education (P=0.008) and father's education (P=0.019), so that people with higher education level referred to a gynecologist or several providers. Using chi-square test, there was no significant difference between the type of provider of maternity care with father's occupation (P=0.934) and mother's occupation (P=0.408). Similarly, using this test,

there was no significant difference between the type of provider of prenatal care and family income (P=0.286). Also, the chi-square test did not show a significant difference between the delivery method and the type of providers of care for pregnancy (P=0.537). Also, there was no significant difference between the type of prenatal care providers and the prevalence of preterm labor (P=0.638).

By chi-square test, there was a significant difference in the number of alive children and the type of provider of care for pregnancy (P=0.001)), so that the average number of children of women who referred to gynecologist was 1.73, but for women who selected the family practitioner as the provider of pregnancy care was 2.41.

There was a significant difference between the providers of prenatal care and the place of providing of pregnancy care using chi-square test (P<0.001). Thus, 60.3% of the women who referred to the private clinic for prenatal care received their care gynecologists.

There was a significant difference between the age of the fetus at the time of delivery and the type of prenatal care providers (P=0.005). There was a difference between the gynecologists and midwifery groups (P=0.011), whereas the mean age of the fetus at the time of birth in a group that selected midwife as their care provider was 39.59±1.16 but in the gynecologist group was 38.65±1.48 weeks.

By non-parametric Kruskal-Wallis test, there was no significant difference between the maternity care providers and head circumference (P=0.413), height (P=0.250) or weight of newborns (P=0.293). The mean and standard deviation of neonatal outcomes based on the various providers of prenatal care were shown in Table 2.

Fig:. Percent of Women Referring to different Prenatal Care Providers of Shiraz University of Medical Sciences Hospitals, Iran

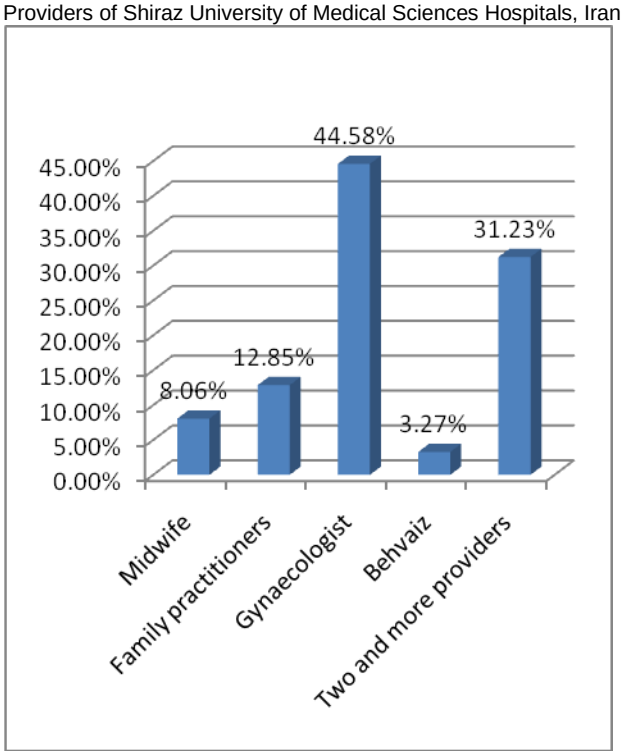

Table 1: Socio-demographic and obstetric characteristics of the participants.

Characteristics of Participants		Frequency	Percent
Educational level for women	Illiterate Under-diploma Diploma & higher Bachelor & higher Doctor	20 146 166 63 2	5.0 36.8 41.8 15.9 0.5
Level of education for husband	Illiterate Under-diploma Diploma & higher Bachelor & higher Doctor	16 163 170 45 2	4.0 41.1 42.8 11.3 0.5
Occupation status for women	Housewife Employed	370 27	93.2 6.8
Occupation status for husband	Unemployed Employed	310 86	78.1 21.7
Family income	<20,000,000 Rials ≥20,000,000 Rials	387 10	97.5 9.5
Number of alive child	1 2 3 ≥4	165 142 60 30	41.5 35.7 15.2 7.6
Number of abortion	0 1 ≥2	279 89 29	70.3 22.4 7.3
Setting of prenatal care provision	Non-governmental Governmental Both of them	68 232 97	17.1 58.5 24.4
present mode of delivery	Vaginal delivery Caesarean	141 256	35.5 64.5
Place of residence	Rural Urban	99 298	24.9 75.1

Table 2: Comparison of neonatal outcomes based on the type of prenatal care providers in women referred to hospitals affiliated to Shiraz University of Medical Sciences–Iran.

Prenatal care providers	Neonatal Head Circumference (cm) (Mean ± SD)	Neonatal Height (cm) (Mean ± SD)	Neonatal Weight (gram) (Mean ± SD)	Gestational Age(week) (Mean± SD)
Midwife	34.6±1.7	50.9±2.0	3333.1±589.2	39.6±1.2
Gynecologist	34.4±1.5	50.2±2.9	3139.3±503.4	38.6±1.5
Family practitioner	34.9±1.2	51.1±2.1	3259.2±405.9	39.1±1.3
Behvarz	34.6±1.7	50.3±1.8	3140.8±270.4	39.3±1.18
Two and or more providers	35.2±1.2	50.7±2.6	3157.2±486.1	39.5±1.3
P-Value (Kruskal–Wallis test)	0.279	0.153	0.186	0.001

DISCUSSION

This study was the first research, in which neonatal outcomes of were investigated among women with low-risk pregnancies referred different groups of prenatal care providers in Iran. In the present study, there was no difference in the birth weight of neonates in different groups of pregnancy care providers Which was similar to the findings of researches in Singapore and New Zealand[22,23]. Based on the results, the highest mean weight was for neonates whose mothers received prenatal care from a midwife during pregnancy, while the lowest birth weight belonged to neonates of women who had chosen a gynecologist as their provider of pregnancy care. This difference may be related to the difference in how to provide prenatal care. For example, women receiving care from a midwife may receive more information and training during pregnancy from their provider[26].

The findings of this study showed that there was a difference in the age of neonates at birth among various groups of prenatal care providers, so that the age of neonates in women who received care from a midwife was higher than the age of neonates were in the gynecologist group. In a Cochrane review, lower fetal weight at birth was associated with early labor interventions[24]. The results of this study showed that nearly half of pregnant women selected a gynecologist as their provider of pregnancy care. In fact, gynecologists were the first provider of care for pregnancy. This finding with results the previous study was consistent, which showed that 67.8% of women in the province of Fars-Iran referred to a gynecologist to receive pregnancy care[27]. According to previous studies conducted in Iran, 62% of pregnant women in Tehran and more than 70% in Isfahan referred to gynecologists for prenatal care while in the United Kingdom, there is an emphasis on providing midwife-based care[15,19].

In this study, although about one-third of pregnant women received prenatal care from multiple providers at the same time, their neonatal outcomes were similar to those who chose a prenatal care provider. Researchers in Florida reported that about three quarters of women had more than one doctor for their pregnancy care[28]. In Canada, 22% of low-risk pregnant women also referred to multiple providers to receive pregnancy care[29]. Similarly, 27% of African women reported receiving pregnancy care from more than one provider[30]. This is while researchers believe referring to multiple providers in pregnancy, in addition to providing different information that leads to the confusion and anxiety of pregnant women[29]. imposes large costs on the health system and families and takes a lot more time for pregnant women that is not at all affordable[31]. The World Health Organization emphasizes the protection of families against the cost of health services and recommends cost-effective measures that have a significant impact on the health of the community and the economy[32]. In this regard, one of the policies of the health care systems is to reduce costs and to avoid unnecessary expensive services[5]. In order to avoid receiving similar prenatal care and saving time and cost of the government, families and health care providers, using the referral system is an appropriate strategy[33].

In Iran, primary health care services are provided to pregnant women in rural and small towns through behvarzes or midwives, and with referral system, but the family physician program without referral system has been implemented in Shiraz, capital of Fars provinces[10].

The findings of this study showed that there was no statistically significant difference between weight, height and dyspnea of neonates of women with low risk pregnancy referring to different providers. Other research findings have shown that family physicians, midwives, and gynecologists provide similar pregnancy services to pregnant women, there is no significant difference in the outcome of delivery for women with low risk pregnancies[29]. Given that midwives and gynecologists have trained skills at the university, and the expenditure on education and training of a gynecologist is far greater than that of a midwife, the neonatal outcomes of low-risk pregnant women from a gynecologist, are similar to those women who have been cared for by a midwife[15,34]. Therefore, it is suggested that the maternity services of low-risk pregnant women are provided by midwives. Also certified midwives under the supervision of gynecologists should provide physiological and vaginal childbirth. This can be an optimal strategy for providing prenatal care to low-risk pregnant women, in order to enable gynecologists to provide more specialized care to high-risk pregnant women.

Studies have shown that midwives who have been trained and supported very well, can prevent maternal and neonatal mortality[35]. For example, over the past three decades, Burkina Faso, Guatemala, Cambodia, Indonesia and Morocco have been investing in midwives to improve maternal and infant survival. The experience of these countries confirms that this effective strategy has reduced maternal and infant morbidity and mortality[36]. Midwives can promote community health where midwifery services are effectively integrated into the health system and the quality of care is regularly monitored. In other words, it can be argued that the use of midwives is a viable solution to the challenges of providing high quality care for all women and babies[37].

At the end, it can be cited that getting the right decision to select a prenatal care provider can not only make optimal use of human resources, but also by reducing the cost and save time, low risk pregnant women can have a positive and pleasant experience of the golden period of pregnancy. Also, providing these conditions may be a factor in encouraging families to bring later children in next years[38,39,40] considering the fact women's health is one of the millennium development goals and paying attention to the performance of the midwifery care has a particular importance[41], hoping for policy makers to create effective systems for providing pregnancy care, considering the past experience of Iran and the success of other countries and taking into account health policies and facilities of the country.

According to the results of this study, the authors recommend that further research be conducted with the aim of decision-making of pregnant women for choosing their prenatal care provider. Also further research is necessary in order to find out the causes receiving prenatal care from several providers simultaneously

According to the above-mentioned results, the strength of the present study was that for the first time in Iran, the neonatal outcomes were compared in women who received prenatal care from different providers. One of the limitations of this study was that the results could not be generalized to high risk pregnant women because these women needed specialized care and were not evaluated in our study. Since this research was not possible in private hospitals, it was only conducted in public hospitals affiliated with the medical sciences, which is another limitation of this study.

CONCLUSION

Pregnant women should choose an appropriate pregnancy provider which save their time and money and make optimal use of human resources. Regarding the results of this study, it can be said that taking care of pregnant women with low risk by midwives can reduce the burden of care for gynecologists and provide an opportunity for them to enable provide high quality pregnancy care to high risk women.

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