Health Literacy, Antenatal Care Adequacy Indicator, and Delivery Outcomes in Pregnant Women in Zahedan, Iran

ARTICLE INFO

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ABSTRACT

Aims Paying attention to the health of pregnant women leads to the newborn's health and, ultimately, the health of society. Health literacy and knowledge of antenatal care reduce neonatal and maternal fatality, increase maternal and neonatal health. Therefore, the current research aimed to investigate the association of health literacy, antenatal care adequacy indicators, and delivery outcomes.

Instrument & Methods This Descriptive-analytical study was performed on 113 pregnant women attending the health centers of City Zahedan in 2020. Samples were selected by multi-stage method, and data were collected by the questionnaire of maternal health literacy and pregnancy outcomes (MHLAPQ) and a checklist. The Independent t-test, one-way analysis of variance, and Pearson correlation coefficient were used to analyze data by SPSS 21 software; the significant level was <0.05.

Findings The average score of pregnant women's health literacy was 54.5±6.9, and 34.5% of women in this study had a university education. There was a significant relationship between prenatal care adequacy and health literacy (p=0.03). A significant relationship was observed between prenatal care adequacy and birth weight (p=0.04)

Conclusions Prenatal care adequacy and health literacy indices were predictors of birth weight, indicating the need to pay more attention to prenatal care and health literacy in health promotion programs.

Keywords Health Literacy; Prenatal Care; Pregnancy

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Introduction

One major phase in a woman's life is pregnancy accompanied by psychological and physical changes, reducing the quality of life [1]. Prenatal care is routine care that includes examining and consulting on essential pregnancy issues, reassuring, educating, and supporting pregnant mothers and their families, resolving gestational dissatisfaction, and providing an ongoing clinical and laboratory screening program to confirm low-risk pregnancy [2]. Antenatal care has a key role in determining and reducing risks, including low birth weight, stillbirth, and infant death over life's first year [3]. As a result, the adequacy of prenatal care is very important and is one of the important indicators in predicting infant and maternal mortality [1]. Every year, 15.5% of infants (more than 20 million) are born with low birth weight worldwide [4]. This rate is 6% in China and Canada, 7% in the United States and Britain, and 12% to 14% in Mexico and Indonesia [5, 6]. This rate is reported in Iran at 16.5% [6, 7]. The overall fetal mortality rate in receiving prenatal care is 2.7 per 1000 births, and in cases of not receiving maternity care is 14.1 per 1000 births [8]. One of prenatal care adequacy indexes is birth weight; it is one of the major maternal health status indicators during pregnancy. This index can be affected by several factors, including nutritional, social, economic, and personal conditions of the mother; fetal and maternal diseases; genetic factors; poor care during pregnancy; body mass index and overweight during pregnancy [9]. Among the factors that are examined to assess the health of society is the prevalence of low birth weight (LBW), below 2500 grams, per year in each society, and the lower the prevalence in a society, the higher the level of health and especially prenatal care is in that society [10]. Studies have shown a significant reduction in low birth weight among women who receive prenatal care [6, 11]. Infants overweight or underweight are at increased risk of mortality and physical and neurological disorders [12-13]. Low birth weight in developed and developing countries is a serious challenge to maternal and neonatal health so that the mortality rate of infants weighing below 2500 grams is 40 times, and infants weighing below 1500 grams is 200 times higher than infants born with a weight of above 2500 grams [14, 15]. Health Organization estimates that spending as much as 3$ per person will prevent most maternal deaths, half of the infant's deaths, and the painful and long-term disabilities that millions of women in low-income developing countries suffer from [16]. Despite providing prenatal care by health centers, elements, including low awareness and maternal health literacy, prevent the correct and timely delivery of prenatal care[8, 17]. Adequacy of prenatal care plays a role in the normal Apgar score at birth. Determining the Apgar score is a scientific method in the honest assessment of infants immediately after birth and helps identify infants needing immediate resuscitation for hypoxic acidosis [18]. Apgar coefficient includes the overall score of five clinical findings, taken from the initials of the words "Appearance, Pulse, Grimace, Activity, and Respiration". The Apgar score is given a score of zero, one or two based on clinical evaluation [19]. This scale is used to assess asphyxia and predict the infant's nerve damage and survival rate during the first minute of birth, with a minimum Apgar score of zero and a maximum of ten[18].

Regarding the effect of health literacy and maternal awareness of prenatal care, women are identified as the first target population in increasing health literacy [20]. Health literacy refers to the ability to obtain, process, and comprehend the essential information and services necessary for suitable health-related decision-making [21]. Health literacy is a global issue in the 21st century. Accordingly, the World Health Organization has recently announced health literacy as one of the major health determinants in a report [22, 23]. It is believed that individuals with poor health literacy have less health awareness, receive fewer preventive services, and have difficulty controlling chronic diseases [24]. Despite evidence that refers to the importance of health literacy, many caregivers and educators are either unaware of this issue or do not have the necessary skills and confidence to approach the clients [8, 25]. Maternal health literacy affects pregnancy outcomes by enhancing the quality of prenatal care [6, 26]. Paying attention to the importance of pregnant mothers' health leads to the health of the infant and, ultimately, the health of society [1, 27].

Since few studies have been conducted in Sistan and Baluchestan, which is ethnically different from the rest of Iran, the current research aimed to investigate the relationship between health literacy, prenatal care adequacy indexes, and delivery outcomes in pregnant women in Zahedan.

Instrument and Methods

The current descriptive-analytical research was performed in 2019 by a multi-stage sampling method with a sample size similar to previous studies Izadi Rad *et al.* [6]. Number 113 pregnant women attending the health centers of Zahedan were selected to take part in this study, considering 18% of the possible sample drop. In this method, Zahedan health centers were first divided into five regions; south, north, west, east, and center; then, one of the five mentioned areas was chosen randomly. In the next stage, 46 women were selected from each center by convenience method based on inclusion (all 15-35 years old women with reading and writing literacy who have newly given birth) and exclusion criteria (lack of chronic diseases, lack of high-risk pregnancy, and non-compilation of questionnaire fully). Finally, 113 samples from 5 centers were included in the

research. The data collection lasted from November 2019 to the end of March 2020.

Data collection was performed from 3 methods performed using the questionnaire, checklist, and information in the patients' files (Apple system). Participants in the study were assured that their information would be confidential and only be used for research purposes. Conscious consent was obtained from all participants. A checklist and two questionnaires were applied to collect data in this research. The first questionnaire included personal characteristics such as age, ethnicity, mother's job, mother's education, and household income. Mojunila in Nigeria developed the second questionnaire, Maternal Health Literacy and Pregnancy Outcome Questionnaire (MHLAPQ). The reliability and validity of this questionnaire have been verified in Peyman *et al.* [28]. The accredited and localized version of (MHLAPQ) [8] has 26 items for each subscale, including; items 1 to 14 for maternal health literacy and items 15 to 26 for pregnancy outcomes. Each mother responded to the questions by strongly agreeing, agreeing, disagreeing, and strongly disagreeing. Since all participants could read and write, the questionnaires were completed by pregnant women. The research team developed the adequacy of prenatal care and neonatal outcome checklist. The checklist consisted of two parts: Part one was related to information on the adequacy of prenatal care (time of the first visit, number of pregnancies performed, BMI of the mother before pregnancy, weight gain during pregnancy according to BMI, how to take supplements and receive necessary training during pregnancy by caregivers), and part two was related to information on neonatal outcomes (birth weight, Apgar score of zero and five minutes). The checklist was completed using the information in the household file in the Apple system. The coded, confidential and anonymous checklist and questionnaire were used to observe ethical issues.

The Chi-square and correlation coefficient was applied to analyze data by SPSS software version 21 the significant level was <0.05. Descriptive statistics, including tables and statistical charts and central and dispersion indexes, described the data.

Findings

The frequency distribution of participants' qualitative demographic variables and their relationship with health literacy and adequacy of prenatal care are summarized in Table 1. According to the results of health literacy score in women with primary, secondary, high school, and university education, also based on one-way analysis of variance, a statistically significant relationship was observed between health literacy and education level of pregnant women (p<0.05). The health literacy level of pregnant mothers had a significant relationship with the variables of job, monthly

income, and ethnicity; it, however, showed no significant statistical relationship with birth weight and Apgar score of the infants. further, a significant relationship was observed between prenatal care adequacy and variables of job, mothers' monthly income, infant's birth weight, and Apgar score of infant (p<0.05; Table 1)

Table 1) Frequency distribution of qualitative demographic variables of participants and their relationship with health literacy and adequacy of prenatal care

Variable	N (%)	Health literacy		Adequacy of prenatal care	
		M±SD	p.	M±SD	p.
Education					
Primary	22 (19.5)	47.86±7.40	<0.001	19.10±4.20	0.037
Secondary	17 (15.0)	51.65±5.00		20.18±3.40	
High school	35 (31.0)	54.50±4.50		19.23±3.60	
University	39 (34.5)	59.60±5.00		19.33±3.50	
Employment					
Housekeeper	107 (94.7)	54.00±6.50	0.001	19.21±3.60	0.003
Employed	6 (5.3)	63.67±7.90		15.80±3.50	
Monthly income					
Less than 500000	19 (16.8)	51.68±6.20		20.50±2.40	0.001
500000-100000	43 (38.1)	52.30±6.30	<0.001	19.70±3.50	
More than1000000	51 (45.1)	57.50±6.50		17.92±3.90	
Ethnicity					
Baluchi	46 (40.7)	51.10±6.20	<0.001	18.87±3.50	0.048
Fars	67 (59.3)	57.00±6.00		19.24±3.80	
Birth weight (gr)					
< 1500	-	-	0.81	-	0.004
1500-2500	15 (13.3)	55.67±7.50		20.00±2.38	
2500-4000	94 (83.2)	54.50±6.90		18.90±3.60	
> 4000	3 (2.7)	520±3.50		14.00±6.00	
Apgar score					
5-7	7 (6.2)	56.30±4.40	0.49	16.00±2.20	0.003
8-10	106 (93.8)	54.40±70		19.00±3.50	

Table 2) Relationship between adequacy of prenatal care and weight / Apgar score at birth

Variable	Mean±SD	p-value
Birth weight (gr)		
Less than 1500	--	
1500-2500	20.00±2.38	0.004
2500-4000	18.90±3.60	
More than 4000	14±6.00	
Apgar score		
5-7	16.00±2.20	0.035
8-10	19.00±3.50	

The mean±SD scores of Pregnant women's health literacy were 54.50±6.90, and it was 19.00±3.60 in the adequacy of prenatal care score. According to the Pearson correlation analysis, a significant and positive relationship was observed between health literacy and prenatal care adequacy (p=0.037, r=0.60).

Discussion

This research indicated a significant relationship between adequacy of prenatal care and health literacy. A significant relationship was observed between prenatal care adequacy and birth weight. A significant relationship was observed between health literacy, antenatal care adequacy indicator, and the

variables of occupation, education, monthly income, and ethnicity of pregnant women. In Rahmani *et al.,* a significant relationship was shown between health literacy and variables of age, years of education, and changes from housewife to employee [21]. In Baqaei *et al.,* a significant relationship was observed between functional literacy and level of education, job, and income of samples [20]. The study of Bostani *et al.* showed the importance of prenatal care adequacy index as an important indicator in areas of neonatal health. With the inadequacy of this index, there were negative neonatal outcomes such as low birth weight [1], which is consistent with our results. This study showed a significant relationship between antenatal care adequacy index and neonatal outcome (birth weight and Apgar score).

The study of Briese *et al.* showed a significant decrease in preterm and low birth weight infants in women receiving prenatal care, indicating a significant relationship between prenatal care and birth weight [29]. Khanal *et al.* showed that 12% of infants to have LBW and their mothers had neither attended antenatal care nor had taken iron pills during pregnancy, so they showed a significant relationship between prenatal care and delivery of infants with low birth weight (LBW) [30]. In a study by Debiec *et al.,* the ratio of low 5-minute Apgar scores was 13.8%, and low birth weight was one of the factors significantly related to low 5-minute Apgar scores [27]. The current research showed a significant and positive relationship between health literacy and prenatal care adequacy, so that with increasing health literacy, prenatal care also increased. In a similar study by Izadi Rad *et al.,* health literacy had less predictive power than prenatal care adequacy index for predicting low birth weight, owing to the indirect impact of health literacy on birth weight. Various studies have shown that health literacy improves pregnancy outcomes by promoting prenatal care[6]. This work showed that the health literacy level of pregnant mothers' understudy was moderate.

Considering the impact of motherly health literacy level on infant and family health, and also given the results of this study that showed monthly income, occupation, ethnicity, and maternal education play an important role in promoting health literacy, it seems necessary to take this point into account in macro-planning and policies to witness the health literacy promotion in the society. Our research indicated a significant relationship between the adequacy index of prenatal care and childbirth outcome. Also, considering the mean and standard deviation of the adequacy index of prenatal care in the present study (19±3.6), we found that pregnant women were receiving insufficient prenatal care. As a result, the cause of inadequate care must first be identified, and plans must be made at the macro-level to address this issue. In addition to educating pregnant women about the importance and necessity of timely care

during pregnancy, they must be motivated to seek care and engage in self-care. Therefore, careful implementation of health education programs to improve the quality of prenatal care by health care providers seems to reduce the adverse outcomes at childbirth significantly. One of the limitations of this study is that the research project is limited to urban areas, so it is recommended to conduct similar studies in rural areas to examine the level of health literacy of pregnant women in urban and rural areas to see the costly consequences of Decrease the level of health literacy to prevent neonatal care and outcomes. Another limitation of this study was the working hours of health centers that coincided with working mothers or students who were less likely to participate in the study. Another limitation of this study was the lack of access to the private sector, which allowed only mothers who referred to public health centers to enter the study. Also, due to the simultaneous collection of data with the prevalence of influenza and Quaid 19, pregnant women had fewer visits to health centers, and fewer samples were included in the study, which is one of the most important limitations of the present study.

Conclusion
Given the vital role of health literacy in promoting caregiving behaviors during pregnancy and Its effect on pregnancy outcomes, including birth weight, it is worthy for pregnant women to have access to health information in the field. Provide adequate prenatal care and be considered in planning and policymaking.

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