Original Article

Health Literacy and Its Predictors Among Pregnant Women: A Cross-sectional Study

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Abstract

Background: Due to the great importance of health literacy during pregnancy and its direct impact on the health of the mother and her child, this study aimed to evaluate the health literacy of pregnant women in a semi-urban area, Kuhdasht county, located in western Iran and to investigate its associated factors.

Methods: This is a cross-sectional study conducted on 300 pregnant mothers referred to a governmental prenatal care center in Kuhdasht county, Iran, in 2019. Data collection tools included a demographic form and the Persian version of the Maternal Health Literacy and Pregnancy Outcome Questionnaire (MHLAPQ). Collected data were then analyzed through SPSS software version 22 using the Pearson correlation test and Multiple linear regression analysis.

Results: The mean score for the maternal health literacy dimension was 58.38 ± 8.87 (out of 70), and it was 47.20 ± 6.22 (out of 60) for the pregnancy outcome dimension. This indicates that the current pregnant women had adequate health literacy and pregnancy outcome. Further, there was a significant relationship between maternal health literacy and pregnancy outcome ($r=0.58$, $P=0.001$). Moreover, multiple linear regression results indicated that age, occupation, education, ferrous sulfate uptake, history of abortion, frequency of pregnancy, the trimester for prenatal care initiation, and birth weight of infants could not significantly predict health literacy in women ($P>0.05$).

Conclusion: The health literacy level of pregnant women in Kuhdasht county, Iran, is adequate but not high. Accordingly, it is necessary to further consider maternal health literacy in socio-economic and health planning due to its effect on the health of the child and mother.

Keywords: Health literacy, Pregnant women, Prenatal care, Maternal health

Introduction

Health literacy is the ability to obtain, read, understand, and use healthcare information to make appropriate health decisions and follow instructions for treatment (1,2). Since the mother's health behavior affects her own health and her child's health, health literacy plays an important role during pregnancy (3). It helps pregnant women know how to acquire skills and how to provide prenatal care (4). Pregnant women with low health literacy are less likely to take folic acids during pregnancy or engage in prenatal care at later gestational age, leading to more hospital stays.3 These women are at risk of a complicated and difficult pregnancy and adverse pregnancy outcomes, including inadequate self-caring and preventive behaviors (5,6). Therefore, they are less likely to make informed medical decisions (3). Women with adequate health literacy levels, on the other hand, have a better understanding of the dangers of risky health behaviors such as insufficient physical activity, non-adherence to medication, poor blood sugar control, unbalanced nutrition, and smoking. They have babies with desirable birth weight and are less likely to give birth prematurely (7). Kharazi et al (8) in a study concluded that maternal health literacy and perceived diet self-efficacy in pregnant women play an important role in predicting pregnancy outcomes and neonatal birth weight. Mojoyinola (9) found significant relationships of maternal health literacy with antenatal care and healthy pregnancy.

Some studies in Iran and other countries have evaluated the health literacy levels of pregnant women using different scales. Guler et al (10) used the Turkish Health Literacy Scale and found that 33.9% of pregnant women in Turkey have a sufficient level of health literacy. Kohan et al (7) utilized a researcher-made questionnaire and found out that 34% of pregnant women in Isfahan, Iran, have low health literacy, 48% moderate, and 18% good health

literacy. Using the Test of Functional Health Literacy in Adults (TOFHLA), Ghanbari et al (11) observed that 30% and 23.6% of pregnant women in Tehran, Iran, have inadequate and moderate health literacy, respectively. Hoseinpour et al (12) also used TOFHLA and reported that 62% of rural pregnant women in Izeh county, Iran, have moderate and inadequate health literacy. Employing TOFHLA, Safari-Moradabadi et al (13) reported that 52%, 20.8%, and 27.2% of pregnant women in Bandar Abbas, Iran, have adequate, moderate, and inadequate levels of health literacy, respectively. Zaree et al (14) used TOFHLA to measure the health literacy of pregnant women in Minab county, Iran, finding out that health literacy of 58.9% was at a satisfactory level, and health literacy of 17.37% was at a moderate level. Likewise, Dadipoor et al (15) used TOFHLA and found out that 15.5% of pregnant women in southern Iran (e.g., Boushehr, Ahvaz, Zahedan, and Bandar Abbas) have an inadequate level of health literacy, 41.7% have a moderate level, and 42.8% have an adequate level. In Asadi and colleagues' study(16), using TOFHLA, the health literacy level in pregnant women in Yazd, Iran, was moderate. Few studies have used the Maternal Health Literacy and Pregnancy Outcome Questionnaire (MHLAPQ) developed by Mojoyinola (9), most of which have been conducted in Iran. Charoghchian Khorasani et al (17) employed the MHLAPQ and reported that the mean score of health literacy in pregnant women living in Mashhad, Iran, is 42% out of 56%, which is adequate. Kharazi et al (18) reported that mean score of MHLAPQ in pregnant women referred to health centers in Mashhad, Iran, is 42.47 ± 7.54 ranging from 21 to 56. Forghani et al (4) used MHLAPQ and concluded that the health literacy level of pregnant women in Fariman county, Iran, is adequate. Using MHLAPQ, Zade Safaie et al (19) also showed that the health literacy level of pregnant women in Rasht, Iran, is desirable.

Adequate access and understanding and use of health information are necessary, especially in vulnerable situations such as pregnancy (3). In this regard, and since no study has been conducted on the health literacy of pregnant women in western Iran by MHLAPQ, this study aimed at determining the health literacy status and its predictors among pregnant women living in Kuhdasht county in Lorestan, Iran.

Materials and Methods
This cross-sectional study was conducted among all pregnant women referred to the governmental prenatal care centers in Kohdasht county, Iran, during 2018-2019. All of them (n = 300) entered into the study based on a census sampling method. Inclusion criteria were having the willingness to participate in the study, writing and reading literacy, and having no psychological disorders. After explaining the study objectives to them, they signed a written informed consent form. Then, they completed a form surveying demographic and clinical information (e.g., age, education, occupation, history of abortion,

ferrous sulfate uptake, multivitamin use, number of prenatal care visits during pregnancy, the time to get prenatal care, frequency of pregnancy, and birthweight) and the MHLAPQ. The Persian version of MHLAPQ prepared and evaluated by Kharazi et al (20) was used in this study. It contains 26 items measuring maternal health literacy (items 1-14) and pregnancy outcomes (items 15-26). The items are rated on a 5-point Likert scale as 1 = strongly disagree, 2 = disagree, 3 = no idea, 4 = agree, and 5 = strongly agree. The pregnancy outcome section was completed after delivery by the women when they referred to the clinic to receive post-pregnancy care. The total score of the maternal health literacy domain ranges from 14 to 70, while the total score of the pregnancy outcome domain ranges from 12 to 60. A higher score indicates higher maternal health literacy and pregnancy outcome. The MHLAPQ has a Cronbach's alpha value of 0.81 (7). For the Persian MHLAPQ, Kharazi et al (20) reported Cronbach's alpha coefficients of 0.89 and 0.67 for the maternal health literacy section and the pregnancy outcome section, respectively.

The collected data were analyzed via SPSS software version 22 using descriptive statistics (mean and standard deviation), multiple linear regression analysis (to find the predictors of health literacy), and Pearson correlation test (to examine the relationship between maternal health literacy and pregnancy outcome scores). The significance level was set at 0.05.

Results
The mean age of participants was 25.42 ± 5.99 years ranging from 16 to 39 years. Most of them had middle school or lower degree (n = 98, 32.7%), were housewives (n = 289, 96.3%), had no history of abortion (n = 232, 77.3%), had consumed ferrous sulfate (n = 195, 65%) or multivitamin (n = 195, 65%), had prenatal visits < 7 times (n = 288, 96%), started getting prenatal care in the first trimester (n = 181, 60.3%), were first-time mothers (n = 130, 43.3%), and delivered babies with a birthweight > 2500 g (n = 266, 89.4%). Other characteristics of the participants are presented in Table 1.

The mean maternal health literacy score of participants was 58.38 ± 8.87 ranging from 32 to 70, and for the pregnancy outcome section, it was 47.20 ± 6.22 ranging from 29 to 60. This indicates that they had adequate health literacy and pregnancy outcome. Table 2 presents the frequency of answers to the MHLAPQ items. As can be observed, most women answered that they "strongly agree" or "agree" with the questions. The items with which women disagreed more were item 25 stating "I had a lot of problems during my pregnancy" (n = 80, 27%) and item 17 stating "I attend prenatal classes regularly" (n = 47, 15.7%) related to the pregnancy outcome section as well as items 9 and 14 stating "I have the ability to read, understand and interpret prescriptions and medical instructions" (n = 76, 25.3%) and "I have the ability to find health information from the books or the internet"

Table 1. Demographic and Clinical Characteristics of the Participants (N = 300)

Characteristics		N	%
Age (y)	≤25	158	52.7
	>25	142	47.3
Education	Middle school and lower	98	32.7
	Without high school diploma	90	30
	With high school diploma	85	28.3
	Academic degree	27	9
Occupation	Housewife	289	96.3
	Employed	11	3.7
History of abortion	Yes	68	22.7
	No	232	77.3
Ferrous sulfate uptake	Yes	195	65
	No	105	35
Birthweight of the baby (g)	<2500	34	10.6
	>2500	266	89.4
Multivitamin use	No	105	35
	Yes	195	65
Number of prenatal visits	<7	288	96
	7-10	12	4
The trimester for prenatal care initiation	First trimester	181	60.3
	Second trimester	76	25.4
	Third trimester	43	14.3
Frequency of pregnancy	1	130	43.3
	2	96	32
	3	54	18
	>3	20	6.7

Note. N: Number.

(n = 61, 20.3%), respectively, related to the maternal health literacy section.

The results of the Pearson correlation test showed a significant relationship between maternal health literacy and pregnancy outcome scores (r = 0.58, P = 0.001) so that with the increase in maternal health literacy, pregnancy outcomes could improve. The health literacy score of women with age < 25 years (58.86 ± 7.46), housewives (58.61 ± 9.55), first-time mothers (58.86 ± 15.11), without a high school diploma (58.93 ± 7.92), with no history of abortion (58.67 ± 8.68), with ferrous sulfate (57.10 ± 8.23) and multivitamin use (58.26 ± 8.23), number of prenatal visits < 7 times (58.62 ± 7.53), delivering a baby with a birth weight < 2500 g (58.92 ± 7.15), and getting prenatal care in the first trimester (58.72 ± 8.60) were higher compared to the other groups.

Multiple linear regression analysis was run to find the demographic, clinical, and obstetric factors that can predict health literacy in subjects. All factors had a linear relationship with health literacy except the two factors of multivitamin use and the number of prenatal visits. Therefore, they were excluded from the regression model. The coefficient of determination (R^2) was obtained to be 0.057, indicating that age, occupation, education, ferrous

sulfate uptake, history of abortion, frequency of pregnancy, the trimester for prenatal care initiation, and birth weight of infant could explain only 5.7% of variations in maternal health literacy. As Table 3 indicates, the regression coefficients suggested that none of the mentioned factors could significantly predict health literacy in pregnant women ($F_{(9,290)} = 1.242$, $P > 0.05$).

Discussion

The purpose of this study was to determine the health literacy level of pregnant women and investigate its related factors. The results showed that their health literacy was high (Mean = 58.38 for maternal health literacy and 47.20 for pregnancy outcome). This is consistent with the results of previous studies conducted in Mashhad (17,18), Fariman (4), and Rasht (19), Iran, where the researchers used MHLAPQ and reported an adequate health literacy level for pregnant women. In investigating the factors that can affect the health literacy of mothers, results revealed that their health literacy has no correlation with their age, occupation, and education. This rejects the first hypothesis of this study. The health literacy scores of women aged under 25 years, housewives, and those without a high school diploma were higher, but it was not statistically significant. Therefore, these factors cannot affect the health literacy of pregnant women. Most of the women in this study were young (age < 25 years) and can better obtain, understand, and use healthcare information compared to older ones, which may be a reason for the lack of significant difference in terms of age. Similarly, most of the studied women were housewives (96.3%) which can contribute to the non-significant effect of the occupation factor. The majority of women living in Kuhdasht have lower education, and this study showed that most of them have middle school and lower education (32.7%). This may the reason for the non-significant effect of education in this study, although the education level alone cannot be enough for understanding healthcare information as some educated women do not have enough prenatal care information. In Asadi and colleagues' study (16), using TOFHLA, the highest score of health literacy in women in Yazd was related to pregnant women aged > 31 years and those with master's degrees. Further, the difference was reported to be significant, and regarding occupation, the lowest score was related to housewives, but no significant relationship was found between the health literacy of pregnant women and their occupation. This indicates that the results of the present study are against the results of Asadi and colleagues' study (16) in terms of age and education, but they are consistent in terms of occupation. Using TOFHLA, Ghanbari et al (11) found that there are significant differences between the health literacy of pregnant women in Tehran and their age and education. Safari-Moradabadi et al (13) and Dadipoor et al (15) used TOFHLA, finding a statistically significant association between health literacy and education, age, and occupation of pregnant mothers in southern Iran.

Table 2. Frequency of Answers to the MHLAPQ Items

Items	Strongly Agree	Agree	No Idea	Disagree	Strongly Disagree
I can read and write	188 (62.7)	100 (33.3)	11 (3.7)	1 (0.3)	-
I can do basic math operations (e.g., calculating the amount of fruit and vegetables or meat based on the needs in pregnancy).	166 (55.3)	121 (40.3)	9 (3)	4 (1.3)	-
I can understand basic medical terms for pregnancy (e.g., anemia, edema, hypertension, etc.).	153 (51)	73 (24.3)	45 (15)	29 (9.7)	-
I can read and understand health-related materials properly.	159 (53)	89 (29.7)	36 (12)	16 (5.3)	-
I can understand and interpret basic and simple health information (e.g., brushing, washing hands, etc.).	203 (67.6)	94 (31.4)	1 (0.3)	2 (0.7)	-
I have the ability to read, understand and behave according to the teachings of healthcare providers.	151 (50.3)	104 (34.7)	42 (14)	3 (1)	-
I can read health booklets and gain personal hygiene and food hygiene skills during pregnancy and postpartum.	95 (31.7)	148 (49.3)	54 (18)	3 (1)	-
I have the ability to read and understand the danger signs during pregnancy (e.g., anemia, paleness, shortness of breath, high blood pressure, swelling, bleeding and preterm labor, etc.).	114 (38)	100 (33.3)	43 (14.3)	42 (14)	1 (0.3)
I have the ability to read, understand and interpret prescriptions and medical instructions.	67 (22.3)	73 (24.3)	68 (22.7)	76 (25.3)	16 (5.3)
I have the ability to read and understand the date of my next visit (e.g. for vaccination, health care, medical examination, etc.).	173 (57.6)	89 (29.7)	20 (6.7)	17 (5.7)	1 (.3)
I have enough information and knowledge about the diet needed during pregnancy and after childbirth.	126 (42)	100 (33.3)	36 (12)	38 (12.7)	-
I have enough skills to prepare a proper diet and use it.	104 (34.7)	130 (43.3)	30 (10)	36 (12)	-
I have enough knowledge and skills on how to take care of the baby after birth (e.g. breastfeeding, bathing, etc.).	133 (44.3)	132 (44)	22 (7.3)	13 (4.3)	-
I have the ability to find health information from the books or the Internet.	99 (33)	113 (37.7)	27 (9)	61 (20.3)	-
If I have any of the danger signs of pregnancy, I visit a health center or a private doctor.	155 (51.7)	137 (45.7)	2 (0.7)	6 (2)	-
I have enough information about the danger signs during pregnancy.	100 (33.3)	101 (33.7)	57 (19)	41 (13.7)	1 (0.3)
I attend prenatal classes regularly	117 (39)	112 (37.3)	24 (8)	47 (15.7)	-
I have enough information about vaccination during pregnancy.	85 (28.3)	116 (38.7)	56 (18.7)	43 (14.3)	-
I can take action to deal with any of the danger signs during pregnancy.	101 (33.4)	135 (45.2)	25 (8.4)	38 (12.7)	1 (0.3)
I have the ability to detect danger signs during pregnancy.	83 (27.7)	136 (45.3)	57 (19)	24 (8)	-
I have get timely prenatal care.	177 (59)	87 (29)	1 (0.3)	35 (11.7)	-
I did not experience stillbirth during this pregnancy.	300 (100)	-	-	-	-
I had timely childbirth	118 (38.3)	161 (54.6)	-	20 (6.8)	1 (0.3)
I had a safe and comfortable childbirth	111 (35.7)	103 (35)	68 (23.2)	17 (5.8)	1 (0.3)
I had a lot of problems during my pregnancy	31 (9.2)	38 (12.8)	79 (26.7)	80 (27)	72 (24.3)
I gave birth to a baby with a normal weight (>2500 g).	114 (36.5)	152 (52.9)	-	34 (10.6)	-

Note. MHLAPQ: Maternal health literacy and pregnancy outcome questionnaire.

Table 3. Results of Multiple Linear Regression Analysis to Find Predictors of Health Literacy in Pregnant Women

	Unstandardized Coefficients		Standardized Coefficients	t	P Value	95.0% Confidence Interval for B	
	B	SE	Beta			Lower Bound	Upper Bound
(Constant)	107.291	7.924		13.540	<0.000	91.695	122.887
Age	-0.441	0.278	-0.185	-1.583	0.115	-0.989	0.107
Occupation	-2.219	4.882	-0.032	-0.455	0.650	-11.828	7.389
Education	1.295	0.882	0.088	1.468	0.143	-0.442	3.032
The trimester for prenatal care initiation	0.609	5.104	0.008	0.119	0.905	-9.437	10.654
Frequency of pregnancy	2.187	1.486	0.112	1.472	0.142	-0.737	5.111
Birthweight of the infant	1.230	1.791	0.043	0.687	0.493	-2.295	4.755
History of abortion	-0.004	2.102	0.000	-0.002	0.998	-4.141	4.132
Ferrous sulfate uptake	-0.350	2.101	-0.012	-0.166	0.868	-4.485	3.786

Note. SE: Standard error.

Likewise, Charoghchian Khorasani et al, Forghani et al, and Zade Safaie et al used MHLAPQ, observing a significant relationship between maternal health literacy and mother's education in Mashhad, Fariman, and Rasht, Iran, respectively (4,17,19). These are in opposition to the results of the present study. Zaree et al (14) used TOFHLA and found no significant statistical relationship between the health literacy and educational level of mothers in Minab county, Iran, which is consistent with the present results. In a study on pregnant women in Mashhad, Iran, using MHLAPQ, Kharazi et al (18) found no significant relationship between maternal age and health literacy but reported a relationship between maternal education and health literacy. These discrepancies can be due to diversity in the study population, assessment tool, or geographical location.

In the present study, the MHLAPQ score of first-time mothers, those with no history of abortion, with ferrous sulfate uptake and multivitamin use, number of prenatal visits < 7 times, those who got prenatal care in the first trimester, and delivered a baby with a birth weight < 2500 grams were higher. However, regression analysis showed that none of the factors such as ferrous sulfate uptake, history of abortion, frequency of pregnancy, the trimester for prenatal care initiation, and birthweight of infants could predict health literacy in mothers. Hence, the second hypothesis is rejected. Therefore, these factors cannot affect the health literacy of pregnant women. Asadi et al (16) also found no relation between health literacy and factors such as number of pregnancies, number of abortions, and history of drug use, which is consistent with the results of the current study. Forghani et al (4) reported a significant relationship between maternal health literacy and supplementation. In Dadipoor and colleagues' study (15), pregnant women's health literacy level was correlated with the care provision during pregnancy. In Kharazi and colleagues' study (18), there was a significant relationship between maternal health literacy and the number of care taken during pregnancy, time of starting care, and supplementation. Further, Kharazi et al (18) reported a significant relationship between maternal health literacy and birthweight in pregnant women in Mashhad, Iran, which is against the results of the present study. The discrepancies in the results may be related to the difference in the samples, measurement tools, and geographical locations.

The strength of this study was the assessment of health literacy among pregnant mothers living in a semi-urban area located in western Iran where cities are less developed, and there is a low provision of services and support for mothers compared to northern Iran. There were a few limitations and disadvantages in this study. The first limitation is that only the women living in urban areas of Lorestan were investigated. Secondly, the socio-economic level of subjects was not assessed which may have a confounding effect on the birthweight of infants. Thirdly, a self-report tool was used for the assessment of health literacy in women which can affect the outcome. Moreover, this study was conducted only in one city in western Iran; hence, the results cannot be generalized to all pregnant women in Iran. Therefore, further studies are recommended to be conducted on pregnant women in rural areas of Lorestan and surveying their socioeconomic level using other assessment tools. Accordingly, it is needed to pay more attention to the quality of pregnancy care, inform mothers and improve their health literacy as an effective strategy to improve maternal health, reduce mortality caused by maternal and neonatal complications, and thus achieve the Millennium Development Goals.

Conclusion
The health literacy level of pregnant women in Kuhdasht county, Iran, is adequate. The demographic and clinical factors (e.g., age, occupation, education, ferrous sulfate uptake, history of abortion, frequency of pregnancy, trimester for prenatal care initiation, and birth weight of infant) cannot predict their health literacy. Their health literacy is related to their pregnancy outcome so that with the increase in their maternal health literacy, their pregnancy outcome can be improved. It is necessary to further consider maternal health literacy in socio-economic and health planning due to its effect on the child and family health.

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