

1`Survey of Health Literacy during pregnancy and Its Relationship with Prenatal Care

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ABSTRACT

Background and Objective: Health literacy in pregnant mothers is a cognitive and social skill that shows the motivation and ability of women to properly access, understand, and use the information to maintain the health of themselves and their children. The aim of this study was to investigate health literacy during pregnancy and its relationship with prenatal care.

Materials and Methods: This is a cross-sectional and descriptive-analytical study on 121 pregnant women who referred to the health service centers in Fariman, Iran. Cluster-multistage random sampling method was used to select participants in 2020. The maternal health literacy and Pregnancy (MHLAPQ) questionnaire was used to collect data. Data were analyzed using SPSS 20 software based on t-test, Pearson correlation coefficient and one-way analysis of variance (ANOVA).

Results: The mean score of maternal health literacy was 58.7 ± 37.16 . There was also a significant relationship ($p < 0.05$) between health literacy score and mother's education, household income, number of children, place of residence, pregnancy weight gain, supplementation and, dairy products. According to the Pearson correlation coefficient, health literacy significantly correlated with pregnancy outcome ($p = 0.000$) and birth height ($p = 0.005$).

Conclusion: level of health literacy in new mothers was adequate in this study. Health policy-makers should simplify the health literacy training program for pregnant and lactating women to reduce the various factors that affect their health literacy.

Paper Type: Research Article

Keywords: Health literacy, prenatal care, pregnant women.

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Introduction

Pregnancy is one of the most important stages in a woman's life. During this period, the pregnant mother has more psychological and physical needs for herself and her baby due to the changes, therefore; they need more care. Prenatal care is one of the maternal and child health programs. If this program is adequately and appropriately provided, it could be an appropriate intervention program to improve pregnancy outcomes such as reducing infant mortality and maternal mortality (1).

Careful prenatal care can prevent serious and permanent complications in the mother and baby such as premature rupture of the bladder, subsequent infection, low birth weight, and macrosomia and risk factors for maternal health (2).

Despite the proper parental care in health service centers, it seems that several factors negatively affect the proper and timely receipt of care during pregnancy. One of the obstacles that prevent mothers from referring to the centers to receive this care is the lack of knowledge and literacy of mothers and the lack of information about the number of referrals during pregnancy (3). Health literacy is important for mothers to understand the risks of pregnancy, mothers' awareness and perception of these risks is important for patients' willingness to follow health recommendations (4).

Health literacy can be defined as the ability to read, understand, and act on health and wellness recommendations (5). Health literacy refers to the capacity to acquire and process the basic information and services that need to make appropriate health decisions (6). Health literacy is a relatively new concept in Iran and many other parts of the world (7). Promoting women's health literacy is identified and emphasized as the main target in health literacy concepts (8). Health literacy helps pregnant mothers how to use health

literacy in achieving skills and how to provide prenatal care (9). Health literacy is important for pregnant mothers because women maybe for the first time encounter the health care system during pregnancy, facing this complex system for the first time even with sufficient literacy skills may be difficult. Women with lower literacy skills, experience more problems regarding learning new information and following skills. Women health and their understanding about health information are directly affected children's health during pregnancy and child's growth and development (10). Improving maternal health literacy is a key factor in controlling infant weight (11). In the study by Chow et al., mothers with limited literacy levels had less or late prenatal care and their infants were more exposed to low birth weight and were more admitted to the neonatal intensive care unit (12). Health literacy is the result of the joint efforts of social and individual factors that address the concerns and dimensions of health literacy, and it is recognized as a vital and important indicator in the health care system (13-14). Maternal health literacy is cognitive and social skill that demonstrate the motivation and ability of women to access understand and use the information to maintain the health of themselves and their children (9).

Maternal health literacy depends on the mother's education and ability (15). Mothers with a high level of health literacy have babies with desirable birth weight and are also less likely to give birth prematurely (16). Health literacy in pregnant mothers is special knowledge and special social skills to recognize the danger signs of pregnancy, healthy lifestyle and proper nutrition during pregnancy. Finally, improving the quality of effective health care during pregnancy leads to decrease low birth weight, preterm birth, and infant mortality (16-17).

Health literacy is a stronger predictor of an individual's health status compared to income, employment status, level of education and race and ethnicity (18). Various studies have examined the health literacy in pregnant mothers(19). Their results indicated that limited health literacy in Iranian women (20)(21) In several studies on measuring maternal health literacy in Iran, individual, cultural and linguistic differences have not been considered, and only the Functional Health Literacy Questionnaire in Adults (Test of functional health literacy in adults) has been used. In the present study, the Maternal Health Literacy and Pregnancy Outcome Questionnaire (MHLAPQ) was used. This tool was developed by Mojoinola for examining health literacy in pregnant mothers (23) and it was localized by Peyman et al (24). Therefore, considering the importance of promoting maternal health literacy to promote maternal and infant health and the limitation of similar studies that use a standard questionnaire in this field in the country, this study aims to investigate health literacy during pregnancy and its relationship with prenatal care.

Materials and methods

This is a descriptive-analytical type of cross-sectional study that was performed in 2020 on 121 pregnant women referring to the health service centers for routine pregnancy care in Fariman city. The sample size was calculated based on the study that was conducted by Peyman et al. (24) with a 95% confidence interval and 1 error based on the formula below.

According to the health center report, 45% of pregnant mothers are covered by rural health service centers. Therefore, 45% of the sample were from the rural area (54 people from the village) and 55% of the participants (67 people for the city) were selected from the urban population via stratified sampling. We used the

multi-stage cluster sampling method to select the eligible participants from urban and rural areas. In this study, 7 and 2 health services were randomly selected from urban and rural centers, respectively. Finally, we referred to health centers and checked family records in the Sina system. Pregnant mothers who were eligible to attend the study were randomly selected from the Sina system as well as we asked them by phone to complete the questionnaire at a specific time if desired. participants included in this study if they: were Iranian citizenship, had health records who recently gave birth and wanted to participate in this project. They excluded if they had a chronic illness, high-risk conditions during pregnancy, and using the medicine.

The data collection tool was a questionnaire. The first part of the questionnaire includes demographic information (age of mother and spouse, mother and spouse 's education, mother and spouse 's employment, monthly income, and place of residence) and information about maternal pregnancy including (first day of last pregnancy (LMP), overweight during pregnancy, time of onset of pregnancy care, gestational age, common complaints, whether or not pregnancy is wanted, laboratory information, hemoglobin level, weight, mass index body, taking pregnancy supplements, status of tests, and ultrasounds during pregnancy) which was extracted from Integrated information system)Sina system(. The MHLAPQ Maternal Health Literacy and Pregnancy Outcome questionnaire was used to assess the health literacy during pregnancy. Pregnancy Health Literacy Questionnaire and Pregnancy Outcome Questionnaire had 2 subscales with 32 items that rated based on 5 Likert scales (strongly agree = 5, agree = 4, have no opinion = 3, disagree = 2, and strongly disagree = 1). To calculate the score of each subscale, the scores of each item related to that subscale were added together.

The maternal health literacy score ranged from 14 to 70, and the pregnancy score ranged from 12 to 60. The higher score shows the better health literacy in mother during pregnancy.

The validity and reliability of the questionnaire (MHLAPQ) have been confirmed in the study of Peyman et al. (24). Accordingly, Cronbach's alpha coefficient was 0.89 for the health literacy section, 0.67 for the pregnancy outcome section, and 0.79 and 0.69 for the sub-branches. We collected data based on questionnaires for two months. We informed all mothers about the details and purpose of this study and then they completed the consent form. Confidential and anonymous questionnaires were used to observe ethical issues. In this study, SPSS (version 20) statistical software was used to analyse data based on statistical analysis tests including t-test to investigate the relationship between quantitative and qualitative variables, ANOVA and Tukey test to compare the mean of more than two variables, and Pearson correlation to determine the correlation of quantitative variables with each other. This article was extracted from the research project approved by Mashhad University of Medical Sciences with the approved code of ethics IR.MUMS.REC.1399.407.

Results

A total of 121 pregnant women with a mean age of 26.6 ± 50.80 years, whose minimum and maximum ages were 18 and 41 years, respectively, were included in the study. More than 99% were housewives and only 0.82% were employed. In this study, 54.54% of mothers lived in the city and 45.45% lived in the village. In terms of education, 29.75% of mothers had primary education, 41.32% had secondary education, 21.48% had diploma, and 61.61% had university education. Almost half of mothers were low-income because their income were

less than one million (14.87%) or between one and two million (39.66%), while 45.45% of mothers were moderate income with more than two million per month.

The onset of prenatal care was 87.6% in the first trimester, 9.91% in the second trimester and 1.65% in the third trimester. In terms of BMI at the beginning of pregnancy, 5.78% of mothers were thin, 42.97% were normal, 33.05% were overweight, and 18.1% were obese. Pregnancy status in more than 94% of mothers were a wanted pregnancy, and less than 6% of mothers were an unwanted pregnancy. More than 92% of mothers had received 6 or more times of urinary care. More than 80% of mothers had no history of abortion, and more than 97% of mothers had no history of stillbirth.

According to the results, the mean score of maternal health literacy was 58.7 ± 37.16 and pregnancy results were 48.5 ± 54.06 in the studied women.

According to Table (1), analysis of variance and t-test showed that there was a significant relationship between maternal health literacy and mother's education, area of residence and household income ($p < 0.05$). But pregnancy outcome and prenatal care only had a significant relationship with monthly income.

Table (2) shows the mean score of maternal health literacy in the study population based on pregnancy status. According to the results of t-test, there was a significant relationship between maternal health literacy and optimal weight gain based on BMI at the beginning of pregnancy and the number of live births ($p < 0/05$). But there was no relationship between maternal health literacy and other variables related to pregnancy care ($p > 0/05$).

Table 1: Mean maternal health literacy in the study population based on demographic variables

Variables	floors	Number (%)	Maternal health literacy		Pregnancy outcome	
			M±SD	p- value	M±SD	p- value
Mother's education	Primary	(29.75)36	87.8±25.56	F=2.30 P=0.04	5.03±48.77	F=0.69 P=0.59
	illiterate	(0.82)1	0±45		0±43	
	University education	(6.61)8	04.7±37.62		2.07±50.50	
	Diploma	(21.48) 26	83.5±11.59		5.50±47.96	
	Guidance	(41.32) 50	89.7±80.56		5.20±48.48	
Mother's job	Housekeeper	(99.17)120	57.7±27.58	T= -1.54 P= 0.12	5.03±48.48	T= -1.48 P= 0.14
	Employed	(0.82)1	0±70		0±56	
monthly income	1-2 million	(39.66)48	56.29±6.79	F=11.81 P<0.001	4.81±47.52	F=4.82 P=0.01
	2 million and more	(45.45) 55	61.65±6.13		4.78±50.03	
	Under 1 million	(14.87)18	53.88±9.68		5.51±46.72	
Place of residence	Urban	(54.54)66	60±5.54	T= 2.52 P= 0.013	4.22±49.18	T= 1.48 P= 0.14
	rural	(45.45)55	56.41±9.2		5.85±47.87	
Mother's age	Under 18 years	(9.91) 12	55.58±5.08	F=2.15 P= 0.12	4.54±48.16	F=0.73 P=0.48
	35- 18 years	(83.47) 101	59±0		5.20±48.79	
	35 years and older	(6.61) 8	54.62±9.13		0.70±47.50	

Table 2: Mean and standard deviation of variables related to maternity care with maternal health literacy

Variables	floors	Number (%)	Maternal health literacy	
			M±SD	p- value
When to start pregnancy care	First three months	(87.60)106	58.43±7.48	F=0.002 P=0.99
	Second three months	(9.91)12	58.58±9.32	
	Third three months	(1.65)2	58.50±6.36	
Distance from previous pregnancy	Less than 2 years	(14.87)18	60.05±6.16	F=2.48 P=0.08
	3-2 years	(14.04)17	61.70±7.50	
	3 years and more	(48.76)59	57.62±7.30	
BMI Early Maternal Pregnancy	Overweight	(33.05)40	57.50±7.9	F=0.35 P=0.78
	Obese	(18.1)22	58.72±7.56	
	normal	(42.97)52	58.63±7.47	
	thin	(5.78)7	60.28±8.3	

Wanting to get pregnant	Yes	(94.21)114	58.51±7.68	T= 1.24 P= 0.21
	no	(5.78)7	56±6.4	
Optimal weight gain based on BMI	Yes	(48.76)59	60.33±8.08	T= 2.87 P= 0.005
	no	(50.41)61	56.44±6.72	
Number of cares provided during pregnancy	4 times or less	(1.65)2	58.5±6.36	F=0.78 P=0.46
	5 times	(4.5)6	54.66±9.11	
	6 times and more	(92.56)112	58.65±7.55	
Number of pregnancies	1	(28.09)34	57.58±8.07	F=0.83 P=0.43
	2	(25.61)31	59.87±5.89	
	3 times and more	(46.28)56	58.01±8.16	
Number of abortions	0	(80.16)97	58.35±7.35	F=0.02 P=0.98
	1	(13.22)16	58.25±9.51	
	2 times and more	(6.61)8	58.87±7.76	
Number of stillbirths	0	(97.52) 118	58.26±7.67	F=0.62 P=0.53
	1	(1.65)2	61±1.41	
	2 times and more	(0.82)1	66±0	
Inform the mother's pre-pregnancy weight	Yes	(89.25)108	58.53±7.79	T= 0.68 P= 0.494
	no	(10.74)13	57±6.05	
Number of live children	0	(14.04)17	56.64±7.84	F=1.83 P=0.02
	1	(29.75)36	58.88±7.12	
	2	(21.48)26	61±6.89	
	3	(28.92)35	58.05±7.8	
	4	(3.3)4	55.75±7.93	
	5	(2.47)3	46.33±4.04	
Baby weight	Under 2500 grams	(8.26)10	54.90±7.50	T= -1.51 P= 0.13
	2500 grams and above	(91.73)111	58.68±7.58	

Table (3) shows the daily intake of meat, eggs, legumes, milk and dairy products, fruits, vegetables, and supplements during pregnancy. The results showed that there was a significant relationship between maternal health literacy score and multivitamin supplementation and milk and dairy consumption ($p < 0.05$). Maternal

health literacy score was higher in women who consumed 3 or more units of food groups per day than women who consumed fewer units per day, but; this difference was not statistically significant.

Table 3: Average health literacy of pregnancy based on the amount of food intake and supplements in pregnancy

Variables	floors	Number (%)	Maternal health literacy	
			M±SD	p- value
ferrous sulfate	complete	(94.21)114	58.41±7.65	T= 0.23 P= 0.81
	Incomplete	(5.78) 7	57.71±7.45	
multi vitamine	complete	(82.64) 100	59.27±7.19	T= 2.91 P= 0.004
	Incomplete	(17.35)21	54.09±8.30	
meat, eggs and legumes	3 units and more	(58.67) 71	58.94±7.37	F=0.59 P=0.55
	Less than 3 units	(39.66)48	57.66±8.09	
	Rarely / Never	(1.65)2	55±1/41	
Milk and dairy	3 units and more	(66.94)81	59.61±7.02	F=3.43 P=0.03
	Less than 3 units	(32.23)39	55.89±8.32	
	Rarely / Never	(0.82)1	54±0	
Fruits and vegetables	3 units and more	(57.85)70	59.22±6.93	F=2.61 P=0.07
	Less than 3 units	(38.01)46	62.8±6.05	
	Rarely / Never	(4.13)5	56.58±8.43	

According to Table (4), there was a positive and significant relationship between health literacy with pregnancy outcome and height at birth ($p > 0.05$).

Table 4: Correlation of health literacy with pregnancy outcome and height at birth

		Pregnancy outcome	Height at birth
Maternal health literacy	Pearson Correlation	.672**	.254**
	Sig. (2-tailed)	.000	.005
	N	121	121

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Discussion

Research from the World Health Organization shows that about 6,000,000 women die each year from pregnancy-related illnesses (22). The mortality rate is affected by various economic and social factors. Improving mortality rate is considered as a sign of society's progress and

main development indicators in countries (25). In women's health concept, it is important to pay attention to their social, economic, educational, mental, and psychological status. Since pregnancy increases women's health needs, and physical and mental problems, pregnancy care is the

most important guarantee for maintaining the mother and child's health (7). Maternal health literacy and mother's special knowledge and social skills are essential to diagnose danger signs, healthy lifestyle and appropriate nutrition during pregnancy, and these factors could be effective in pregnancy outcome by improving the quality of prenatal care (8).

In the present study, the mean score of maternal health literacy was 58.7 ± 37.61 . The findings indicated that the issue of health literacy among women newly delivered is satisfactory. In the study of Nodoshan et al (26) and Kharazi et al (27) based on the Maternal Health Literacy and Pregnancy Outcome Questionnaire (MHLAPQ), the mean score of maternal literacy and pregnancy outcome were 54.67 ± 9.85 and 42.47 ± 7.54 , respectively.

In the study of Zarei et al and Meshki et al., pregnancy health literacy in more than half of women in Minab and Gonabad was evaluated as good status (28-29). The findings of Khosravi et al. and Bani Hashemi et al indicated that the functional pregnancy health literacy of the majority of adults in Kerman, Shiraz and Bushehr was sufficient (30-31). The level of appropriate health literacy in pregnant women in the study of Akbarinejad et al (32) was 19.7% of the total population and in the study of Kohan et al (16) was 18%. The level of maternal literacy of women referring to Kerman health centers was also reported to be moderate in the Amiresmaili study (1). The adequate level of pregnancy health literacy in pregnant women was 89% in study that was conducted by Yin et al (33) and was 88.6% in research by Von Wagner et al (34). According to the results of the present study and its comparison with the findings of other studies, it can be said that the level of maternal literacy in newborn women was favorable. Differences in assessment tools, research community, implementation method, interview method,

place and time of study can be the cause of differences in the present results. Also, women who referred to the comprehensive health service centers probably had higher awareness and they consequently higher health literacy due to the simple access to the health care center of midwife and the face-to-face training program that was provided for them.

The results of the present study showed that the maternal health literacy score of women increased with increasing level of education and this difference was significant. This finding is consistent with the results of Kharazi et al (27), Nadushan et al (26), Safari Moradabadi et al (5), Tol et al (18), Amiresmaili et al (1), Javadzadeh et al (35) and the study of La Vonne and Zun (6). These results are also consistent with the fact that in many populations and cultures there are similarities between women in this field because women with higher education showed better understand and awareness to implement health information.

The results of the present study showed that there was no statistically significant difference in maternal health literacy scores between employed and housewives which could be due to the low number of employed people (0.82%) in the study sample. These findings were also consistent with the results of some studies such as Peyman and Abdollahi (22) and Ghanbari et al (20). However, Safari Moradabadi et al (5) indicated a significant relationship between raw scores of pregnant health literacy and occupation.

The findings of this study did not show a significant relationship between people's age and their level of health literacy. These findings are consistent with the results of Mohseni (36), Rafiezadeh. The results of Ghanbari (20), AmirEsmaili (1), Tol (14), Javadzadeh (35) studies did show a negative correlation between age and health literacy (37).

In the present study, there was a significant difference between health literacy and place of residence that was consistent with studies that were conducted by Bani Hashemi and Amirkhani (31), Ghanbari et al (20) Jovic-Vranes et al (19) and Downey, and Zun (38) in health centers in urban and rural emergency rooms.

Also, with increasing household income, the health literacy of pregnant mothers increases which was confirmed by the results of studies by Kharazi et al (27), Bani Hashemi and Amirkhani (31), and Tol et al (14). However, La Vonne and Zun (6) and Kohan et al (16), and Ghanbari et al (20) showed an insignificant relationship between pregnancy women's health literacy and income. This mismatch may be due to the different economic and social statuses of the studied populations and the consequent distorting effect of this variable (economic status) (33).

In this study, women who was employed or students less participate in this study because they could not able in health services during working time. Working with pregnant women was also difficult due to their special mental status toward the length of the questionnaire. One of the strengths of this study was that it was the first study to examine the health literacy status in pregnant women in Fariman city. Therefore, the data obtained from this study can provide useful information in the field of health literacy and its relationship with some social demographic influential factors among pregnant women.

Conclusion

The findings of this study showed that the average maternal health literacy in newborn women is desirable. Since, limited health literacy can prevent the correct understanding of health messages and recommendations, it is essential to promote the health literacy in pregnant mothers with low education and inappropriate

socio-economic status through the revision of educational materials and providing oral and visual education program. In addition, we recommended providing educational materials in the form of posters, pamphlets, and brochures, as well as improving communication skills between health workers and mothers.

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