

Original Paper

# Assessing the Health Literacy Level of Mothers of Under 5-year-old Children With Malnutrition



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**Citation:** Bashirian S, Esmaeilpour-Zanjani S. Assessing the Health Literacy Level of Mothers of Under 5-year-old Children With Malnutrition. *J Holist Nurs Midwifery*. 2018; 28(3):157-162. <https://doi.org/10.29252/hnmj.28.3.157>

**Running Title:** Health Literacy of Mothers of Children With Malnutrition. *J Holist Nurs Midwifery*.

**doi:** <https://doi.org/10.29252/hnmj.28.3.157>

Funding: See Page 161  
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**Article info:**

**Received:** 12/11/2017

**Accepted:** 02/15/2018

**Keywords:**

Health literacy, Malnutrition, Underweight

## ABSTRACT

**Introduction:** Health literacy is defined as the ability to read, understand, and utilization of the basic health information to lead a better and healthy life. Low health literacy has a direct relationship with lower health and increased hospitalization.

**Objective:** This study is aimed to investigate the health literacy level in mothers of children under the age of 5 years suffering from malnutrition in families and been supported by the health centers in Bojnourd City, Iran.

**Materials and Methods:** This cross-sectional and analytical study, using cluster sampling method, was performed on 448 mothers with malnourished children under 5 years of age. Malnutrition in children depends on three indicators of weight-for-age, weight-for-height and height-for-age to determine their underweight, wasting and stunting status. To measure the level of health literacy in mothers, the test for functional health literacy in adults was employed. Data were analyzed using descriptive statistics and Kruskal-Wallis statistical test.

**Results:** Based on the study results, the prevalence of underweight, stunting, and wasting of children were 83.9%, 7.1% and 8.9%, respectively. The average health literacy score of mothers was 66.98% out of which 32.1% had an inadequate level of health literacy. Comparison of the mean of health literacy scores by Kruskal-Wallis test showed that mothers with occupation and education had different levels of health literacy while mothers who were employees with a university degree had significantly higher levels of health literacy ( $P=0.001$ ).

**Conclusion:** Increasing the health literacy in mothers may be an effective way to prevent malnutrition among children. Most of the mothers in this study had an adequate level of health literacy, and the percentage of mothers with inadequate and marginal health literacy was also in considerable number. Given the importance of the health literacy, it seems necessary to have more concern and attention in this regard.

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## Introduction

The term “Health Literacy” refers to a set of skills that individuals need to understand the importance of getting basic health care. These skills include the ability to read, understand and interpret information of some parameters such as food labels, measuring blood glucose levels and compliance with prescription diets [1]. This term was first introduced in 1970, and its importance in the field of public health and health care is increasing day by day [2]. In the United States, low health literacy is one of the main problems in the field of health [3]. In a health literacy study in Kerman City, Iran, it was found that 4.8% people had inadequate health literacy and only 53.8% had adequate literacy levels [4]. Results of a study showed that the parents with low health literacy have lesser ability to interpret information on the food labels [5]. Hence, mothers with lower levels of health literacy seem to lack a clear understanding on the issues of nutrition and malnutrition in their children and thus, unable to meet the nutritional needs of their child [6]. The proper nutrition of the child is essential for their normal growth, resistance to infections, prolonged health in adulthood, neurological and cognitive development [7].

Developing countries have the highest percentage of undernourished children and nearly 60% of deaths of children under the age of 5 in such countries are directly related to malnutrition and subsequent diseases [8]. According to reports, malnutrition is the leading cause of child mortality in the world and accounts for half of their deaths [9]. In Iran, malnutrition of children is one of the nutritional health problems [10]. About 7.4% of children in the whole country have short stature (stunting) 2.5% are underweight at birth and the prevalence of weight loss (wasting) in children under the age of 5 years is 7.3% [11]. Malnutrition rate in Bojnourd City has been reported as 3%, 4.8% and 4.9% based on weight-for-height, height-for-age and head circumference-for-age, respectively [12]. In mothers with a lower level of health literacy, the probability of having a baby with low birth weight is also higher. Moreover, these women are more likely to delay seeking prenatal care. Mothers with a higher level of health literacy were less likely to have anemia due to the higher use of supplements and vitamins during pregnancy. All indicate that in lower-educated mothers, the baby born is of lower health status [13]. Ashraf-Ganjoei et al. [14] in their study showed that women with lower literacy receive less care during pregnancy and they begin their parental care at a higher

gestational age. According to Yee and Simon [15], women with lower levels of health literacy are more likely to experience adverse pregnancy complications. The findings from another study suggested that pregnant and lactating women should attend training classes to increase their health literacy and become familiar with the warning signs of pregnancy [16].

Despite the great importance of health literacy for mother and child health as well as the significant rate of malnutrition in Iran and Bojnord, this issue has not been addressed too much. One example for the effects of health literacy can be on the process of raising children by mothers and more generally by the family. The aim of this study was to determine the level of health literacy in mothers of children under the age of 5 years suffering from malnutrition among families supported by health centers in Bojnord City.

## Materials and Methods

This is a cross-sectional and analytical study conducted on mothers of the children under 5 years of age, supported by the health centers in Bojnord City in 2015.

The sampling process was as following: after explaining the objectives of the study and obtaining written consent from the participants, they were selected based on the inclusion criteria. Then the questionnaire was presented to the subjects, and the research method was explained to them. Also, they were assured of the confidentiality of their personal information. Collected data was analyzed in SPSS 22 using descriptive statistics. Since the distribution of health literacy data was not normal according to the Kolmogorov-Smirnov test, non-parametric Kruskal-Wallis test was used to examine the differences between the study groups.

The inclusion criteria were children with malnutrition supported by Bojnord health centers, and the exclusion criteria were mothers who were not able to respond correctly, defective child health records, children with acute and chronic diseases and dehydrated children. To take the maximum sample size, the P value was considered as 50%. To determine the sample size, according to the formula, considering 95% confidence level ( $\alpha=0.05$ ,  $z\pm 1.96$ ) and maximum acceptable error ( $d=0.05$ ), the sample size required for this study was obtained as 400. Finally, 448 mothers having malnourished children were evaluated. In this study, cluster sampling method was used in two stages: first Bojnord City was divided into two districts based on local divisions, and each district had five health centers. The area under the supervi-

sion of each health center was considered as a cluster. Finally, from each health center (cluster), an average of 45 samples was included in the study depending upon the inclusion criteria.

To assess malnutrition, the height of the children under 2 years of age was measured in lying position; the height of children over 2 years was measured in standing position; the weight was measured with a calibrated scale by the researcher and to be assured these indices were measured twice, and the mean was recorded as the final result. The nutritional status of the children was examined based on the three indicators of weight-for-age, weight-for-height and height-for-age (based on the standard child growth tables) which are used to determine underweight, wasting and stunting statuses [11].

After selecting 448 mothers with malnourished children, the information was collected by two questionnaires from them. The first questionnaire was an inventory related to the demographic characteristics of the child and the mother, and the second was the test for functional health literacy in adults. This tool consists of two sections: a. Reading comprehension; and b. Numerical ability. In the reading section, the subject's ability for reading authentic texts related to health care was evaluated. This section included three texts related to the instructions for upper gastrointestinal imaging, the pa-

tient's rights and responsibilities in the insurance forms and a consent form. They are provided in 50 questions each with 4 answers. In the numeracy section with 17 items, patients are presented with cue cards containing explanations of some medications, clinic appointments, obtaining financial assistance and an example of a blood glucose test result.

The patients were given 20 minutes to answer reading comprehension questions and 10 minutes for answering numeracy section. After 30 minutes, the questionnaires were collected, even though incomplete. Each of the 50 questions in the reading comprehension section has 1 point score (total score=50), and the score of 17 questions in the numeracy section was factorized by 2.941 to reach 50 (at most), and the total score of the questionnaire was calculated in a range from 0 to 100. The health literacy scores of the patients were then classified into three categories of inadequate (0-59), marginal (60-74) and adequate (above 75) levels [17].

Face and content validity of this tool was confirmed by the faculty professors. Its reliability, through a 10-day re-test on 10% of the subjects (N=45) who completed the health literacy questionnaire, was measured using the Spearman test and the results showed appropriate reliability (r=0.91). After receiving the approval letter (code No. 5.1821) from the Ethics Committee of Islamic Azad

**Table 1.** Health literacy level of mothers of children with malnutrition

Health Literacy (Level)	N (%)
Inadequate (0-59)	144(32.1)
Marginal (60-74)	124(27.7)
Adequate (75-100)	180(40.2)
Total	448(100)

**Table 2.** Relationship between Health literacy level of mothers and malnutrition of children

Health Literacy \ Malnutrition	N (%)	Mean±SD		
		Total Score of Health Literacy	Reading Comprehension	Numerical Ability
Underweight	376(83.9)	66.67(1.22)	32.29(0.62)	34.38(0.81)
Stunting	32(7.1)	73.81(3.55)	37.13(1.56)	36.69(2.53)
Wasting	40(8.9)	64.35(4.74)	33.90(2.18)	30.45(2.85)
Total	448(100)	66.98(1.14)	32.78(0.57)	34.20(0.75)
Sig.*		0.175	0.112	0.475

\* Kruskal-Wallis test

**Table 3.** Results of the relationship between demographic characteristics and Health literacy level of mothers

Health Literacy	Demographic Characteristics	N (%)	Health Literacy Score		Sig.
			Mean	±SD	
Educational level	Illiterate and elementary	114(25.4)	52.84	(1.90)	0.001*
	High school diploma	156(34.8)	62.96	(2.05)	
	University degree	178(39.7)	79.55	(1.35)	
Occupation	Employee	92(20.5)	81.37	(2)	0.001*
	Self employed	30(6.7)	63	(3.87)	
	Housewife	326(72.8)	63.28	(1.33)	
Age (year)	≤25	113(25.2)	63.46	(2.17)	0.122**
	26-40	319(71.2)	68.17	(1.37)	
	41≥	16(3.6)	68	4.95	

\* Kruskal-Wallis test ( $P < 0.001$ ); \*\* Kruskal-Wallis test ( $P < 0.05$ )

University of Tehran Medical Branch, and receiving an introduction letter from the faculty and relevant authorities, the researcher approached to the health centers of Bojnord City and received permission from them.

## Results

According to the study results, most of the children (58.9%) were girls. About 39.7% of children were second-born child, and most of them (83.9%) had malnutrition in the form of underweight; 45.5% were between 1-10 months old, and 65% had a birth weight of 2.8-3.8 kg. According to the [Table 1](#), most mothers (40.2%) had adequate health literacy (75-100); 27.7% were at marginal level (60-74), and 32.1% had inadequate health literacy level (0-59). Most of the mothers had a university degree (39.7%) and were housewives (72.8%) while many (71.2%) were between the age of 26 and 40 years.

The means for the scores of overall health literacy, reading comprehension, and numerical ability were reported as  $66.98 \pm 1.14$ ,  $32.78 \pm 0.57$ , and  $34.20 \pm 0.75$ , respectively ([Table 2](#)). Kruskal-Wallis test was used to assess the difference in these scores among different malnutrition groups. The scores for these three factors in the three groups of stunted, wasted and underweight children was not statistically significant.

Based on the results presented in [Table 3](#), there was a significant relationship between education and health literacy level where higher educational levels increased the health literacy levels in the mothers ( $P = 0.001$ ). Also, between the job and the health literacy level, there was a significant association; mothers with in-office jobs (em-

ployee) had higher levels of health literacy as compared to those with other jobs ( $P = 0.001$ ). About age and its effect on the level of health literacy, no significant relationship was found between mothers of different age groups.

## Discussion

The results of the current study showed that most of the mothers of malnourished children had a high level of health literacy, and there was no significant relationship between malnutrition and health literacy level. The relationship between mothers' demographic characteristics and health literacy level of participants showed that, in terms of education, housewife mothers compared to other occupations, had a higher level of health literacy. With regard to age and its effect on health literacy, no significant relationship was not found between different age groups of mothers.

In Ghaljaei et al. study [18], the most prevalent malnutrition outcomes were underweight, stunting, and wasting. Also, malnutrition in children had a statistically significant association with birth weight, mother's job and the duration of breastfeeding [18]. Similar to these findings, in the present study, the most prevalent malnourishment symptoms among children were lower weight followed by stunting and wasting. Results of Yin et al. [19] in America showed that health literacy of almost one-third of the people was below the standard level. In the present study, most mothers were at a high level of health literacy; however, a significant proportion of the population had an inadequate level of health literacy. Studies have shown that overall, health literacy in Iran is low and most parents of malnourished children with

inadequate health literacy are in need of interventional and educational programs [20].

Carthery-Goulart et al. [21] showed that health literacy was positively correlated with schooling and negatively correlated with age. Education was a significant predictor of health literacy and illiterate people needed special assistance to properly understand the health care directions. La Vonne et al. [22] also pointed out that the health literacy level had a relationship with the education and age. Artinian et al. [23] reported that patients with inadequate health literacy were significantly older, had lower functional literacy and annual income. Adequate health literacy had a significant association with age, race, education, marital status, income, employment status and car ownership which were possible predictors for health literacy. In another study, Reisi et al. [24] found out that adults with inadequate health literacy level tend to be older, had lesser years of schooling, lower household income and were females. Similarly, in the present study there was a significant relationship between mother's job and health literacy level. Employee mothers had higher level of health literacy than others. Also, there was a significant association between their educational level and health literacy level; with the increase in the educational level, their health literacy level increased.

Other differences such as the individual, social, cultural and economic differences of the subjects also had effect on their responsiveness and consequently the level of health literacy, but they were not examined in this study due to their high complexity. In a similar study, on 319 mothers in Karachi, Pakistan, maximum loss of weight was seen in children whose mothers had low educational level [25]. A review study in 2014, argued that the increase in health literacy level of parents can also improve the health of children [26]. On the other hand, mothers with a higher educational level perform better in vaccination and nutrition of children than the mothers with lower educational level [27]. These studies show that health literacy in parents, especially in mothers, have a direct impact on the health of children and should be improved by various methods.

Regarding the results of this study, mothers' health literacy played an important role in the nutrition of children and given the fact that the health literacy can be affected by educational level, the mothers can be taught to increase their health literacy. Although the results of the present study showed that mothers in high number had an adequate level of health literacy; however, a significant proportion of them also had marginal or

inadequate health literacy level. In this regard, by devising educational programs and materials that are understandable to the public, the level of health literacy in the community can be promoted, and thus the negative effects of low level of the health literacy in the society can be reduced.

## Ethical Considerations

### Compliance with ethical guidelines

The process of the research was explained to all the participants. All the participants signed the consent form.

### Funding

This study was extracted from an MS thesis in the field of Child Nursing which was submitted to Islamic Azad University of Tehran Medical Branch.

### Conflict of interest

The authors declared no conflict of interest.

### Acknowledgments

The authors would like to thank health authorities in Bojnord City and those who helped us in conducting this research.

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