



## The association between health literacy and self-medication behaviors among women referred to comprehensive health care centers in Sirjan, Iran, in 2017

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### Abstract

**Background:** Self-medication is a challenging issue in health care systems and it seems that health literacy is a determining factor in safe self-medication behaviors. Limited studies are available in this field. Therefore, the aim of this study was to determine the relationship between health literacy and self-medicating behaviors among women referred to comprehensive health care centers

**Materials and Methods:** In this descriptive study, 540 women, who were referred to comprehensive health care centers in 2017, were selected randomly and their health literacy and self-medicating behaviors were assessed through self-reporting method. The data collection tools were the standard Health Literacy for Iranian Adults (HELIA), and the self-medication behaviors questionnaires. Data were analyzed using chi-square, Mann-Whitney U, and Kruskal-Wallis H tests.

**Results:** The results showed that the majority of women (94.6%) had inadequate health literacy. More than 89% of them approved self-medication and more than 98% of them performed self-medication. Older women and those who had a higher education level had lower mean health literacy scores ( $P = 0.021$  and  $P = 0.001$ , respectively). There was no significant relationship between self-medication and demographic characteristics. Furthermore, there was no significant relationship between health literacy and confirmation and performance of self-medication.

**Conclusions:** The women had low health literacy levels and high incorrect self-medication behaviors. Self-medication behaviors are performed independent of health literacy. It seems a reform in women's health programs and the empowerment of women in the target population is necessary in order to promote health literacy skills and appropriate self-medication behaviors.

**Keywords:** Self Medication, Health Literacy, Empowerment, Women Health, Iran.

### Introduction

Self-medication has been recognized as the most common form of self-care worldwide (1). It is defined as the self-prescription of medication to solve health problems without expert help or opinion (2). This is usually performed using

synthetic or hand-made medicines following the advice of unprofessional individuals, including the use of previous prescriptions for themselves or friends and family members, re-use of existing drugs at home, and noncompliance with the prescribed treatment program or the prescribed

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dose change (3). The World Health Organization (WHO) has defined self-medication as the “the selection and use of medicines by individuals to treat self-recognized illnesses or symptoms” (4). The incidence of self-medication in different countries varies according to the extent of their development and has been reported between 4% and 98% in the results of studies (3, 5-10). Poor countries face an increasing trend of self-medication due to the high incidence of diseases and the lack of medical facilities (11). In a review study, the overall incidence of self-medication in Iran has been estimated as 53% (12).

Today, self-medication is an important and challenging phenomenon in health care systems. From a viewpoint, self-medication leads patients to independence in decision-making and management of minor illnesses through empowerment. This will increase the patients' access to medicine, improve the disease symptoms, and establish their active role in their own health care. It also has benefits for the health care system, including facilitating the use of clinical skills, increasing access to medication, and reducing the cost of prescribing drugs. Nevertheless, self-medication cannot be regarded as a completely safe action, rather it has potential risks, including misdiagnosis, increased use of medications, long-term use of medication, drug interference (13, 14), delay in the search for appropriate treatment and medical advice, use of an unnecessary high dose of medication, presentation of rare, but serious and dangerous side effects, incorrect treatment selection, masking serious diseases, risk of dependence and drug abuse, resistance to antibiotics, and increased health costs due to an increase in mortality rates and increased length of hospitalization that can be problematic in some vulnerable groups, including the elderly (15).

In various studies, numerous factors have been introduced to predict self-medication behaviors, including age, sex (7), marital status, depression, activity limitation, life satisfaction (10), education level, income level, place of residence and awareness level (16), past experiences of self-medication and self-assessment of health status (17), cost saving (18), smoking and alcohol drinking, chronic illness, self-efficacy, and low drug literacy (17). Health literacy is associated with the ability of individuals to acquire, understand, and use information for health promotion (19), the situation that happens during the self-medication process according to most researchers; therefore, it seems that health literacy level is a determining factor in the occurrence of self-medication behaviors (20, 21).

Reviewing the existing literature indicated that there are a limited number of studies regarding the relationship between health literacy and incidence of self-medication behaviors. The results of some existing studies indicate that health literacy has a positive relationship with drug literacy and safe use of drugs (22). In another study, researchers also reported higher levels of health literacy among patients performing self-medication (23). The findings of studies have shown that women are active health information searchers (24, 25) and they are more sensitive to their health and preventive measures compared to men (6, 26, 27), and hence, they try self-medication for themselves and family members more than men (6, 28). Thus, it can be said that they play a very significant role in family health care. Considering that most human behaviors are influenced by beliefs, creed, and customs based on the cultural and social context of societies (29), self-medication behaviors can also appear in different societies with different patterns. The researchers in the present study did not find a similar study in Iran investigating the relationship between health literacy and the occurrence of self-medication behaviors. Therefore, this study focused on women's health literacy and self-medication behaviors and was conducted with the aim of determining the relationship between health literacy and self-medication behaviors of women covered by comprehensive health services centers in Sirjan City, Iran.

## Material and Methods

In this descriptive study, the relationship between health literacy and self-medication behaviors of women covered by comprehensive health services centers in Sirjan City was investigated. The study was carried out during the 5 months from August to December 2017. The study was first approved by the research council of Rafsanjan University of Medical Sciences, Iran, with the ethics code of IR.RUMS.REC.1396.85. Subsequently, the researchers referred to the health department of the School of Medicine of Sirjan University of Medical Sciences, and then, to the health centers (6 comprehensive urban health care centers and 19 health bases) and presented the letter of introduction to these places, then, they started sampling. First, the sample proportion for each center was determined based on the population of women covered by each center, and then, the samples were selected using the SIB integrated health system based on the table of random numbers. In the next step, the selected women were invited through telephone call to attend the center and participate in the study. After attending

the center, the research objectives were explained to the participants and they were assured of the confidentiality of the recorded information, then, they were entered into the study if they were willing to participate and had signed the informed consent form.

The study inclusion criteria were age of 18 to 65 years, minimum reading and writing literacy, willingness to participate in the study, and lack of permission for prescribing drugs. In addition, the exclusion criteria included the lack of willingness to complete the questionnaire, inability to answer questions, and incomplete answering of the questionnaire.

The sample size was estimated to be approximately 546 individuals based on the review of the literature, taking into account the 95% confidence coefficient ( $Z_{\frac{1-\alpha}{2}}=1.96$ ), the accuracy

of 0.04 ( $d = 0.04$ ), and also the adequate level of health literacy ( $P = 35\%$ ) (30), and using the formula:

$$n = \frac{Z_{\frac{1-\alpha}{2}}^2 \times P \times (1-P)}{d^2} .$$

The data collection tools included a demographic characteristics questionnaire including questions on age, occupation, education, marital status, and number of children, and a two-part questionnaire. The two-part questionnaire consisted of the standard Health Literacy for Iranian Adults (HELIA) questionnaire among the urban population of Iran (18 to 65 years old) and the self-medication behaviors questionnaire. The HELIA questionnaire was published by Montazeri et al. in 2014 and consisted of 33 items in the 5 dimensions of reading, access, comprehension, assessment, and decision-making and behavior with 4, 6, 7, 4, and 12 items, respectively. The questions are scored based on a 5-point Likert scale ranging from 5-1 (always, most often, sometimes, rarely, and never, respectively). The score of each individual in the subscales was obtained from the sum of the scores; then, according to the tool instruction, these scores were converted to the 0-100 range according to the following formula.

$$\frac{\text{Minimum possible raw score} - \text{Obtained raw score}}{\text{Minimum possible score} - \text{Maximum possible score}}$$

To calculate the total score, the scores of the subscales (based on the 0-100 range) were summed up and the result was divided by 5 (number of subscales). To rank the health literacy

level, the scores of 0 to 50, 50.1 to 66, 66.1 to 84, and 84.1 to 100 are considered to indicate inadequate, not very adequate, adequate, and excellent levels, respectively. This questionnaire has an acceptable validity level and has acquired a reliability of 89% (31).

In this study, self-medication indicated willful treatment with chemical drugs. A researcher-made questionnaire was used to assess the self-medication behaviors among women that contained 22 items regarding the confirmation and performance of self-medication and details of self-medication behaviors. Both the qualitative and quantitative methods were exploited to determine the content validity of the tool. Regarding the qualitative validity investigation, the tool was provided to 10 professors and specialists in health sciences and they were asked to give their comments in writing regarding content comprehensiveness, grammar observance, use of suitable expressions, and appropriate location of the items. Similarly, the content validity ratio (CVR) and content validity index (CVI) were used in order to evaluate the content validity quantitatively (32). In the process of the quantitative evaluation of the validity of the questionnaire, 3 and 19 questions were eliminated and retained due to their CVR values of below 0.49 and over 0.49, respectively (32). Finally, the reliability of the questionnaire was confirmed with a mean CVR of 0.66 and the mean total content CVI of 0.94. The internal reliability of the tool based on all the questionnaires was confirmed by the Cronbach's alpha coefficient of 0.92. The questionnaires were completed by the women through self-report method; however, if the subjects did not have enough time to fill in the questionnaire, the questionnaire was completed through face-to-face interviews.

Data were analyzed using the chi-square, Kruskal-Wallis H, and Mann-Whitney U tests in SPSS software (version 20, IBM Corporation, Armonk, NY, USA).

## Results

A total of 540 questionnaires were eligible for analysis and 6 questionnaires were excluded from the study due to incomplete response. There was no case of exclusion during the course of responding to the questionnaires. The mean and standard deviation (SD) of the participants' age was  $32.22 \pm 8.28$  with a minimum and a maximum age of 18 and 59 years, respectively. In terms of marital status, the vast majority of the women (527; 97.6%) were married. Moreover, 496 of the women (91.9%) were housewives. Furthermore, 275 (50.9%) participants were university graduates and only 4.1% had undergraduate or graduate degrees

in medical sciences. In addition, 467 (86.5%) of the women under investigation had at least 1 child at home at the time of the study. Monthly income of 236 (43.7%), 172 (31.9%), and 132 (24.4%) participants was under 1 million tomans, between 1 and 2 million tomans, and higher than 2 million tomans, respectively.

Regarding the health literacy level, the mean and SD of the total health literacy score of the women was  $27.93 \pm 12.89$  with a minimum and maximum of 0 and 65.83, respectively. Assessing the scores of the subscales revealed that the dimensions of reading, access, comprehension, assessment, and decision-making and behavior had a mean and SD

of  $26.59 \pm 18.35$  (minimum and maximum: 0 and 100),  $31.08 \pm 16.38$  (minimum and maximum: 0 and 95.83),  $19.86 \pm 13.89$  (minimum and maximum: 0 and 67.86),  $32.04 \pm 18.64$  (minimum and maximum: 0 and 100), and  $30.22 \pm 16.56$  (minimum and maximum: 0 and 77.08), respectively. The distribution of the absolute and relative frequencies of the total health literacy levels and its sub-scales has been presented in table 1. Based on this table, the vast majority of the women were in the "inadequate" level in terms of the score of total health literacy and its subscales (Table 1).

**Table 1:** Distribution of absolute and relative frequencies of the total health literacy levels and its sub-scales among women covered by comprehensive health services centers of Sirjan City, Iran, in 2017

Health literacy levels	Rate (%)			
	Inadequate	Not very adequate	Adequate	Excellent
<b>Total health literacy</b>	511(94.6)	29(5.4)	0	0
<b>Reading dimension</b>	506(93.7)	21(3.9)	12(2.2)	1(0.2)
<b>Access dimension</b>	494(91.5)	29(5.4)	14(2.56)	3(0.6)
<b>Comprehension dimension</b>	531(98.3)	8(1.5)	1(0.2)	0
<b>Assessment</b>	465(86.1)	51(9.4)	22(4.1)	1(0.4)
<b>Decision-making</b>	487(90.2)	43(8)	10(1.9)	0

The results regarding the investigation of self-medication among women and the rate of self-medication behaviors revealed that 471 (89.1%) of women confirmed performing self-medication to some degree and 534 (98.9%) of them performed self-medication. Approximately half of the women participating in the study (236 women; 43.7%) always studied the instructions inside the drug box, and about 524 (98.9%) checked the date of expiry of their medications to some degree. In addition, a change in the dosage was reported by 371 (68.7%) of the women. Moreover, 457 (84.9%) changed the type of prescribed medication.

The results of examining other self-medication behaviors of women showed that 288 (53.3%) of them responded the option *always* to the question "When do you take medicine without a prescription?" and only 6 (1.1%) women had chosen the *rarely* option. About 232 (43.0%) women received information for self-medication from pharmacies, 136 (25.2%) used their personal experiences, and 66 (12.2%), 55 (10.2%), and 51 (9.4%) of the women, respectively, received this information from the public media, health workers, and relatives and friends. Approximately 400 (74.0%), 121 (22.4%), and 19 (3.6%) of the women obtained medicines required for self-medication from pharmacies, the existing drugs at home, and friends and relatives and stores, respectively. In response to the question "Which medicines do you often use for self-medication?", the pain killers accounted for the highest rate with 252 (46.7%),

followed by antibiotics (126; 23.3%), anti-allergy drugs (69; 12.8%), vitamins (44; 8.1%), and hypnotics (10; 1.8%). In addition, 39 (7.3%) women had chosen *other options*.

Among the participants, 245 (45.4%), 184 (34.1%), 14 (6.2%), and 97 (17.9%) women used self-medication for cold relief, pain relief, insomnia, and other cases, respectively. In response to the question "What is your most important reason for self-medication?", 198 (36.7%), 105 (19.4%), 82 (15.2%), 53 (9.8%), 13 (2.4%), and 89 (6.5%) of the subjects selected mild problem, cost saving, lack of time, emergency conditions, distrust of physicians, and other cases, respectively.

In response to the question "What consequences of self-medication do you often encounter?", 278 (51.5%), 129 (23.9%), 85 (15.8%), 17 (3.1%) of the women reported relief of disease symptoms, disease treatment, disease prevention, and worsening of symptoms, respectively. Moreover, self-medication did not have any outcome among 31 (5.7%) of the subjects. About 233 (43.1%) women tried to manipulate the type and dosage of the drug after relieving of the symptoms, and more than half of them announced the lack of drug effectiveness and worsening of the disease symptoms as the reasons for changing the type and dosage of the drug. Furthermore, 238 (44.1%) women referred to the medication guide to determine the drug dose during self-medication.

Comparing the health literacy of women participating in the study in terms of demographic

characteristics (including age groups, monthly income level, marital status, occupation, education level, and field of study) indicated no significant

difference except in terms of age and educational level (Table 2).

**Table 2:** Comparison of health literacy level among women covered by comprehensive health services centers of Sirjan City, Iran, in 2017 in terms of age groups and educational level

Variables		Overall health literacy (Mean ± SD)	P
Age (year)	18-35	11.9±27.07	0.021*
	36-45	14.28±28.39	
	> 45	2.14±14.41	
Education	Diploma and below	13.09±33.75	0.001**
	Academic	9.89±22.33	

SD: Standard deviation; \* Kruskal-Wallis H test; \*\* Mann-Whitney U test

Comparison of self-medication among women participating in the study in terms of demographic characteristics (age groups, monthly income level,

marital status, occupation, education level, and field of study) showed no statistically significant difference (P > 0.050).

**Table 3:** Relationship between some self-medication behaviors and health literacy levels among women covered by comprehensive health services centers of Sirjan City, Iran, in 2017

Variables	Health literacy levels		*P
	Inadequate Rate (%)	Not very adequate Rate (%)	
Do you perform self-medication?	Always	274(50.8)	0.642
	Mostly	72(13.3)	
	Sometimes	159(29.4)	
	Never	6(1.1)	
Do you confirm performing self-medication?	Always	64(11.9)	0.913
	Mostly	168(31.2)	
	Sometimes	223(44.4)	
	Never	55(10.2)	
Do you change drug type during self-medication?	Always	12(2.2)	0.021
	Mostly	65(12)	
	Sometimes	350(64.9)	
	Never	81(15)	
Do you change drug dosage during self-medication?	Always	10(1.9)	0.001
	Mostly	51(9.5)	
	Sometimes	282(52.1)	
	Never	178(31.2)	
Do you check the date of expiry of drugs used for self-medication?	Always	361(67)	0.001
	Mostly	100(18.2)	
	Sometimes	44(2.8)	
	Never	5(0.9)	
Do you read the instructions in the medicine box for self-medication?	Always	234(43.4)	0.001
	Mostly	168(31.2)	
	Sometimes	95(17.6)	
	Never	13(2.4)	

\*Chi-square test

The results of the data analysis indicated no statistically significant relationship between confirmation and performance of self-medication by women and their health literacy levels. Regarding the investigation of the relationship of other self-medication behaviors with health literacy

levels, the results of the data analysis showed that there was a significant statistical relationship between health literacy level and referring to the instructions contained in the drug box and also checking the expiry date of the drugs (P = 0.001), so that women with inadequate health literacy

referred more to the instructions in the drug box and checked the expiry date of the drug. Manipulation of the drug type ( $P = 0.021$ ) and drug dose ( $P = 0.001$ ) were significantly higher among women with inadequate health literacy (Table 3). In addition, the results of the data analysis showed

that the method of determining the dosage of self-medication drugs taken by the women under study ( $P = 0.001$ ) and the resource of information on keeping self-medication drugs at home ( $P = 0.024$ ) had a statistically significant relationship with their health literacy levels (Table 4).

**Table 4:** Relationship of self-medication drugs dosage and some self-medication behaviors with health literacy levels among women covered by comprehensive health services centers of Sirjan City, Iran, in 2017

Variables	Health literacy levels		*P	
	Inadequate Rate (%)	Not very adequate Rate (%)		
How to determine the dosage of self-medication drugs	Referring to the medication guide	232(43.2)	5(0.9)	0.001
	Consultation with pharmacist	190(35.2)	11(2)	
	Consultation with friends and relatives	20(3.7)	6(1.1)	
	Previous experiences and speculation	68(12.6)	7(1.3)	
Resource of information on keeping self-medication drugs at home	Referring to the medication guide	342(63.4)	14(2.6)	0.024
	Consultation with pharmacist	87(16.1)	4(0.7)	
	Consultation with friends and relatives	23(6.1)	5(0.9)	
	Previous experiences and speculation	49(9.1)	6(1.1)	

\*Chi-square test

There was a significant relationship between the reasons for changing the dosage of drugs and women's health literacy levels ( $P = 0.005$ ) (Table

5). However, no significant relationship was found between the other self-medication behaviors and the women's health literacy level ( $P > 0.050$ ).

**Table 5:** Relationship between the reasons for changing the dosage of drugs and health literacy levels among women covered by comprehensive health services centers of Sirjan City, Iran, in 2017

Variables	Health literacy levels		p*	
	Inadequate Rate (%)	Not very adequate Rate (%)		
What is the reason for changing the dose of your drugs?	Worsening of symptoms	53(9.8)	6(1.1)	0.005
	Improvement of symptoms	146(27)	11(2)	
	Reduction of complications	137(25.5)	11(2)	
	Other cases	175(32.4)	1(0.2)	

\*Chi-square test

### Discussion

Based on the results of this study, there was no significant relationship between the overall health literacy level and performance of self-medication by women. Given that the health literacy level was inadequate among the vast majority of the women and not very adequate among an insignificant number of women, all the women under study had low health literacy level regardless of confirmation and performance of self-medication by them.

Based on the review of the existing literature, a limited number of studies have examined the relationship between these two components. The studies have mainly focuses on the relationship between health literacy and drug compliance, health status and healthy behaviors, the impact of training programs on self-medication, and etc. Among these studies, a study on the relationship between health literacy and drug compliance among patients with glaucoma can be noted; the researchers in this study reported that patients with

poor health literacy showed less drug compliance (33).

Moreover, in other studies, the researchers also reported a significant relationship between understanding medication orders and health literacy (34) and drug self-management skills (35). The results of other studies revealed that the implementation of an electronic interventional personal training program could be effective on modifying the self-medication behaviors of the elderly with hypertension (36). Only one study was found on the relationship between health literacy and self-medication in the general population of Ardabil City, Iran, and the researchers in the study reported a significant relationship between health literacy and self-medication in their research community (37). It should be noted that the research community in this study was the public population and the investigation tool for self-medication behaviors included four questions designed by the researcher. It seemed that self-medication behaviors among the women under study took place independently of health literacy and under the influence of other factors.

Based on the results of the present study, the drugs used by the women for self-medication were mostly for the treatment of colds and included, respectively, analgesics, antibiotics, anti-allergy drugs, and hypnotics; the results were more or less similar to those of other studies. For instance, in a previous study, cold and coughing were the most common causes of self-medication (38), and in another study, self-medication drugs used among adolescents consisted of non-steroidal anti-inflammatory drugs (NSAIDs) or analgesics, cold stop and anti-cough drugs, anti-allergy drugs, and anti-acids (39). In another study conducted in Iran, herbal medicines had the highest rate, followed by analgesics and antibiotics, in the self-medication program of the people (37). In the present study, self-medication was considered as haphazard treatment with chemical drugs. Perhaps the process of choosing and taking herbal drugs has a different pattern compared to chemical drugs.

The results of this study showed that there was a high incidence of changes in the type and dosage of the drug among the women under study. In addition, the women only paid attention to the instructions inside the drug box to acquire information on their use, and only a few of the women considered the expiry date of the drugs. Overall, these results indicate a high incidence of unsuitable self-medication behaviors among women in the study, while in another study, drug use with a high dosage among adolescents and lack of studying of drug labeling were reported as 21.6% and 10.1%, respectively (39). This indicates

a higher incidence of incorrect self-medication behaviors with increased age and adulthood.

In this study, over 89.0% of women approved self-medication and more than 98% of them performed self-medication. A study has reported that more than half of the people in India believed that self-medication was often healing (40). However, the incidence of self-medication in other environments like the public population of Ardebil City, Iran, and European countries was 45.8% (39) and 61.6% (37), respectively. The higher incidence of self-medication behaviors in the present study was likely related to the nature of the research community (women), as the results of numerous studies indicated the higher incidence of self-medication among women compared to men (17, 41).

According to the results of this study, women referred to the medication guide for the information they needed to determine the dosage and how to store the drug at home; however, in other studies, individuals referred to their own experiences for self-medication (42). Accordingly, due to the low level of health literacy of the subjects, it is not expected that they would refer to individual competencies.

Since low health literacy level is one of the major challenges for health policy-making and healthy lifestyle and behaviors, efforts to gain these skills are recommended along with public health promotion programs. Moreover, improving health literacy is part of the Healthy People 2020 program (43). Furthermore, in the strategic document of the health system policies of the Islamic Republic of Iran, the promotion of health information, accountability, structured ability, and participation of the individual, family and society in provision, preservation, and promotion of health are of the priorities of the health system, using the capacity of cultural, educational, and media entities, and organizations under the supervision of the Ministry of Health, Treatment, and Medical Education (29). Generally, the results of this study showed significant differences in both the health literacy level and self-medication behaviors and the relationship between these two components with the results of similar studies. Therefore, low level of health literacy and high incidence of self-medication behaviors among the women under study require comprehensive planning and measures of health authorities of the study community.

Undoubtedly, the limitations associated with the study method should be taken into account in generalizing the results of this study. Moreover, due to the complexity of health behaviors in different societies and also the self-reporting of

self-medication behaviors, the repetition of this study is recommended using more precise methods and controlling of important interventional factors.

### Conclusion

The vast majority of women had inadequate health literacy level and, while approving self-medication actions, most of them reported incorrect self-medication behaviors. Moreover, no relationship was found between the two components. A review of women's health programs and the empowerment of the women under study to promote health literacy skills seem necessary.

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