Investigation of Psychological Factors Based on Health Belief Model and Health Literacy on Adult Self-Medication in Bushehr Province

ABSTRACT

Background and Objective: Self-medication is a high prevalent behavioral choice that may lead to serious consequences. it is necessary to identify the factors that influence and modify this behavior. In this regard, this study aimed to investigate the role of psychological factors and health literacy on self-medication behavior in adults in Bushehr province.

Materials and Methods: This is a cross-sectional descriptive-analytic study that was conducted on 1013 persons referred to Bushehr comprehensive health centers. The subjects were selected through convenience sampling and completed demographic, knowledge, psychological constructs of health belief model, health literacy, and self-medication questionnaires. Data were analyzed using independent t-test, chi-square and logistic regression models in SPSS software version 22.

Results: Based on the results, occupational status, insurance coverage, knowledge, perceived susceptibility, perceived severity and critical health literacy were predictors of self-medication behavior. According to the results, laborers and retirees were less likely to self-medicate than the unemployed as well as those who were not covered by insurance in comparison to those who were covered by the insurance services. Other results also showed that subjects with higher knowledge and perceived susceptibility had a 1.34- and 1.77-times higher odds of self-medication, respectively. Individuals with higher perceived severity and higher critical health literacy were less likely to practice self-medication.

Conclusion: Improving health insurance coverage and attention to occupation and knowledge, as well as modifying perceived susceptibility and severity beliefs, beside the considering and promoting critical health literacy can be effective in modifying self-medication behavior in individuals.

Paper Type: Research Article

Keywords: Health Literacy, Self-medication Behavior, health belief model, Adults.

▶ **Citation:** Javadzade H, Mahmoodi M, Sharifirad Gh, Fakhraei M, Reisi M. Investigation of Psychological Factors Based on Health Belief Model and Health Literacy on Adult Self-Medication in Bushehr Province . *Journal of Health Literacy*. Spring 2020; 5(1): 39-49.

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Received: 03 February 2020
Accepted: 19 March 2020
Doi: 10.22038/jhl.2020.46306.1101

Introduction

When individuals experience a disease, they manifest various behaviors to improve their condition (1). Self-medication is one of the behavioral choices of people during disease conditions, which means use of medications to treat health problems and disorders. These medications are used according to the person's own discretion or some recommendation by others such as family members and friends with no medical prescription or opinion, and is considered a common behavior in many parts of the world (1,2).

Although self-medication can sometimes be effective in improving the health situation of people and treating mild and not very serious diseases, and even play an important role in reducing the burden on the healthcare system especially in non-developed and less developed countries (3,4), it may still have serious consequences on health. Based on estimations, self-medication by people has claimed 67% of diseases worldwide (5). The consequences resulting from self-medication (especially prescription drugs) without consultation with a physician may emerge in different forms including bacterial resistance (6), drug interactions, incidence of serious side effects, treatment failure, drug toxicity, and drug dependence. Sometimes these complications are irrecoverable (e.g. hepatic and renal disorders), and may significantly increase in healthcare costs (7,8). Self-medication is also the cause of 3% of congenital disorders (5).

In spite of the numerous issues and problems that occur following self-medication, based on a systematic review and investigating 70 previous research, self-medication has a prevalence of 8.5-98% across different regions of the world (1). In Iran, again estimates suggest that self-medication is more prevalent than many other countries, and every Iranian citizen consumes 399 drugs on average annually, which is 2-4 times as large as the global rate (5). Prevalence of self-medication and among Tehranian adults is 67% (9), in Kermanshahi elderly is 83% (10), in Kermanshahi students is 89.6% (11), and in Gorgani elderly is 76.2% (12). Based on research, every Iranian person annually consumes 339 drugs, which is 2-4 times as large as the global standard. The per capita consumption of injection drugs is also 11.4, which is four times as large as per capita consumption in other societies (13).

Considering the progressive rise of self-medication in societies and the direct role of the person in choosing and consuming drugs, in order for individuals to have a long life and a relatively healthy and active life, the factors affecting self-medication behavior should be identified, based on which the best educational strategies should be designed to change and modify this behavior (5). Accordingly, researchers have always emphasized applying theories and models to identify the factors affecting behavior change and modification. One of the comprehensive and effective models in health-behavioral sciences is the health belief model, which considers behaviors as a function of knowledge and attitude of people, and concerning its components, it has been developed based on the fact that it leads to people's perception about a health threat, and directs their behavior towards health (14). Based on this model, if people believe that through self-medication they become susceptible to and develop serious complications resulting from self-medication (perceived susceptibility/vulnerability); they perceive the depth of these risks and the seriousness of the complications in their life (perceived severity); and are directed towards practicing a healthy behavior or quitting a non-healthy behavior (here self-medication) through stimuli that affect them from both internal and

external sources including friends and acquaintances, books, TV, etc.; and perceive the benefits obtained from no self-medication (perceived benefits); and can overcome the inhibiting factors against self-medication (perceived barriers), they would have greater tendency to practice healthy behavior and quit unhealthy behavior (15).

Another factor that has been greatly emphasized today in predicting the behavior in healthcare, and nowadays the role of this factor in healthy behaviors has been recognized far greater than other factors such as age, income, level of literacy, socioeconomic status, etc. is health literacy (16). World Health Organization considers health literacy as socio-cognitive skills determining the motivation and ability of individuals to achieve, understand, and use healthcare information such that they can preserve and promote their health (17). Health literacy has been associated with health-related behaviors in many studies (18-20). However, limited studies have examined the relationship between this important factor in particular its various areas and self-medication. Since understanding self-medication behavior and its associated factors can be very helpful in modifying this risky behavior, thus this study investigated the predictive role of health literacy and psychological constructs of health belief model on self-medication behavior.

Method

This research is descriptive- analytical and cross-sectional performed on 1013 individuals referring to comprehensive healthcare centers of Jam, Dir, and Kangan Towns in Bushehr province, chosen through available sampling method.

The sample size for this study was obtained by PASS 11 software. Based on the self-medication rate in previous studies, P0=0.88 (21), and considering P1=-0.85, as well as the cost and value of error types I and II as α=0.05 and β=0.2, the minimum sample size required for logistic regression analysis was calculated as 905. The inclusion criteria were age above 15, no medical prohibition for consuming a special drug, the necessary ability to cooperate in completing the questionnaire, and consent to participating in this study. The individuals who completed the questionnaire incompletely were excluded, and eventually the information related to 1013 individuals was investigated.

The data collection instrument in this study was a questionnaire consisting of five sections. The first section was related to demographics including age, gender, marital status, education, income status, occupation, any disease, and insurance coverage. The second section contained five 4-option items of awareness (such as which of the body organs are more vulnerable to self-medication?). Score 1 was assigned to proper response, and 0 to wrong response. Higher scores represented greater awareness. The third section was related to the psychological constructs of health belief model, consisting of 5 items for perceived susceptibility (e.g. in case I consume a drug without prescription, I am worried about incidence of its side effects), five items for the perceived severity (e.g. use of drugs without description can lead to aggravation of the condition or disease), 5 items for perceived benefits (e.g. through consuming drugs without prescription, their waste can be prevented), 5 items related to perceived barriers (I do not go a doctor's office to receive medication because my economic situation is not suitable to pay for the visit), and 2 items for guide to action (e.g. regarding proper way of drug consumption, which sources of information do you should use?). The items of perceived susceptibility, severity, benefits, and barriers constructs had responses with a 5-point Likert scale ranging

from absolutely agree to absolutely disagree. The fourth section was related to standard questionnaire of functional health literacy (five items such as: for reading and understanding instructions in healthcare centers, has the size of text been too small for you that you could not read them?), Communication (five items such as: in case of sickness, have you exchanged opinion with others about your malaise or disease?), and critical (for items such as: when you felt sick, did you investigate information you gained regarding accuracy and reliability?) Functional communicative critical health literacy (FCCHL) (22). The response of each item was in a 4-option Likert scale from never to always. The scores of items in each area were summed up together and divided by the number of items of that area, whereby the score of each area was calculated. The minimum score required for the participants based on this questionnaire was 1 and maximum was 4, with higher scores representing greater health literacy. The last questionnaire was related to self-medication behavior (2 items as follows: the person self-medicated for what kind of sickness and using which drug over the last six months). To complete the questionnaires, 20 min was required. To assess the reliability and validity of the health belief model questionnaire, quantitative and qualitative methods were used. In examining the content validity, 10 specialists were interviewed as the panel group. They were asked to present their corrective opinions in a detailed and written way after carefully studying the instrument. It was emphasized that during the content validity quality assessment, issues such as grammar, use of right words, importance of items, and proper arrangement of items are evaluated. After collecting the opinions of the panel group, with consultation with the research team members, the necessary changes were applied in the instrument. In order to ensure whether the most important and proper content (item necessity) has been chosen, content validity ratio (CVR) was used. Also, to ensure whether the tool items had been designed in the best way to measure the desired content, content validity index (CVI) was applied. The CVI results suggested that all items in the three areas of clarity, relevancy, and simplicity acquired a score greater than 0.79 and between 0.85 and 1, and thus were appraised as suitable. The total CVR for the constructs was larger than 0.62 according to Lawshe Table, and deemed suitable.

In order to determine the reliability of the tool, internal consistency method was used. Accordingly, the mentioned questionnaire was completed by 20 participants, with Cronbach-alpha method used to examined the internal consistency of the instrument. The alpha number for the constructs of health belief model and self-medication behavior ranged within 0.78-0.92, whereby the internal consistency of the instrument was confirmed. After confirming the reliability and validity of the questionnaire, the subjects were chosen through non-probabilistic available sampling method by attending the selected centers on all week days (from Saturday to Thursday), and sampling was done. Before completing the questionnaires, the eligibility for inclusion criteria was checked. Then, after describing the study objectives and acquiring informed consent, the questionnaires were provided to the subjects, and they were asked to carefully study the questionnaire, and consider only their own opinions. All research units were justified regarding the objectives of the plan and the anonymity of the acquired information. They were included in case of consent. For the illiterate subjects, the questionnaire was completed as an interview by the researcher. To observe the research ethics, participation was voluntary, the questionnaires were taken as confidential

and anonymous and after acquiring informed consent form. Eventually, the collected data were coded and introduced into SPSS ver. 22. Then, they were analyzed through descriptive statistics (frequency and percentage for qualitative variables, as well as mean and standard deviation for quantitative variables) along with inferential statistics (independent t-test, Chi-square, and logistic regression model). The significance level was considered $p<0.05$.

Results

Overall, 1013 people with the mean age of 31.23±8.68 were studied. The minimum and maximum ages were 15 and 62 years, respectively. Most of them (69%) were female and married (76%). Also, 34% had academic degree and 19.9% were employees. Most of the subjects had no special disease (89.2%) and were under insurance coverage (89.3%). Generally, 83% of the subjects acknowledged that over the last six months, they had self-medication. Most of the subjects (45%) had self-medicated for resolving cold followed by headache (25.7%). The minimum self-medication belonged to Skin diseases (1.5%) (Table 1).

Table 1: Self-medication status by type of disease

Type of disease	Frequency	percentage
common cold	461	45.5
Gastrointestinal Diseases	84	8.3
Menstrual disorders	80	7.9
Headache	260	25.7
Arthritis Diseases	38	3.8
respiratory diseases	31	3.1
Anemia	83	8.2
Muscle diseases	35	3.5
Insomnia	46	4.5
skin diseases	15	1.5
Neurological diseases	30	3
Anorexia and anorexia	27	2.7

The main drug used was syrup as well as adult cold (41.1%) followed by different painkillers (25.5%) (Table 2). Most of the studied subjects reported physicians and nurses (72.1%) as the most important source of acquiring information about the type and method of drug consumption. Also, most participants (68.3%) considered the fear of seriously suffering the complications resulting from self-medication as the main deterrent against self-medication and taking drugs without physician prescription.

Table 2: Self-medication status by type of drug

Type of drug	Frequency	percentage
Multivitamin syrup or pill	107	10.6
Syrup or cold pill	416	41.1
folic acid	83	8.2
Sedatives	64	6.3
Iron pills	151	14.9
Analgesic	258	25.5
Antibiotics	56	5.5
Antihistamines (anti-allergy)	94	9.3

Based on the obtained results, there was a significant relationship between demographic variables including age, insurance coverage, occupation, as well as gender and self-medication (Table 3).

The mean and standard deviation in the studied individuals regarding self-medication was 1.71±1.10; these values for the constructs of health belief model regarding self-medication were 16.77±4.43 for perceived susceptibility, 11.56±3.49 for perceived severity, 12.56±3.41 for perceived benefits, and 12.81±4.36 for perceived barriers. Regarding health literacy, the mean and standard deviation of functional, communication, and critical areas were 2.83±0.79, 2.78±0.51, and 2.72±0.70, respectively (Table 4).

Table 3: Relationship between demographic variables and Self-medication in study participants

Variables		N (%)	Self-medication		p-value
			No N (%)	Yes N (%)	
Gender	Female	699(69)	105(15)	594(85)	0.013
	Male	314(31)	67(21.3)	247(78.7)	
Marital status	Single	221(21.18)	30(13.6)	191(86.4)	0.260
	Married	770(76)	137(17.8)	633(82.2)	
	divorced	22(2.2)	5(22.7)	17(77.3)	
Level of Education	Illiterate	36(3.6)	4(11.1)	32(88.9)	0.519
	Primary education	117(11.5)	16(13.7)	10(86.3)	
	intermediate and High school	516(51)	97(18.8)	419(81.2)	
	College education	344(33.9)	55(16)	289(84)	
work	Unemployed	470(46.4)	80(13.5)	513(86.5)	0.001>
	Manual worker	127(12.5)	35(27.6)	92(72.4)	
	Employee	215(21.2)	37(17.2)	178(82.8)	
	self-employment	68(6.7)	14(20.6)	54(79.4)	
	Retire	10(1)	6(60)	4(40)	
Disease status	Yes	109(10.8)	12(11)	97(89)	0.079
	No	904(89.2)	160(17.7)	744(82.3)	
Insurance coverage status	Yes	905(89.3)	168(18.6)	737(81.4)	0.001>
	No	108(10.7)	4(3.7)	104(96.3)	
Age (Mean ± SD)		31.23±8.68	32.64±10.27	30.95±8.30	0.044

Table 4: Mean and possible range of Knowledge, HBM structures and health literacy

Variables	Mean ± SD	Possible range
Knowledge	1.71± 1.10	5-0
Perceived sensitivity	16.77± 4.43	25-5
perceived intensity	11.56± 3.49	25-5
benefits	12.56± 3.41	5-25
perceived barriers	12.81± 4.36	5-25
Functional health literacy	2.83±0.79	4-0
Communication health literacy	2.78±0.51	4-0
Critical health literacy	2.72±0.70	4-0
Total health literacy	2.79±0.73	4-0

Also, there was a significant relationship between the variables of Knowledge (p-value<0.001), constructs of health belief model including perceived susceptibility (p<0.001), perceived severity (p=0.027), perceived barriers (p=0.032), functional health literacy (p=0.038), and critical health literacy (p=0.015) and self-medication (Table 5).

To determine the predictors of self-medication behavior, logistic regression was used. The results showed that the variables of occupation, insurance coverage status, awareness, perceived susceptibility, perceived severity, and critical health literacy were the predictors of self-medication behavior. Based on the results, workers (OR=0.553) and retired people

(OR=0.091) compared to the unemployed; as well as those with insurance coverage compared to the noninsured were less likely to self-medicate(OR=0.201). Other results also showed that those with greater awareness (OR=1.347) and perceived susceptibility (OR=1.347) were 1.34 and 1.77 times more likely to self-medicate respectively. Finally, the individuals with greater perceived severity (OR=0.862) and critical health literacy (OR=0.673) were less likely to self-medicate (Table 6).

Table 5: The Relationship between Knowledge, HBM Structures, and Health Literacy with Self-medication

Variables	Self-medication		p-value
	No Mean ± SD	Yes Mean ± SD	
Knowledge	1.35 ± 1.12	1.78±1.08	<0.001
Perceived sensitivity	16.51 ± 5.35	18.67±4.10	<0.001
perceived intensity	19.16 ± 3.34	18.56±3.24	0.027
benefits	17.81 ± 3.75	17.91±3.33	0.723
perceived barriers	16.40 ± 5.39	17.34±4.12	0.032
Functional health literacy	2.72±0.87	2.86±0.78	0.038
Communication health literacy	2.75±0.61	2.80±0.49	0.346
Critical health literacy	2.85±0.67	2.70±0.71	0.015

Table 6: Logistic regression of Knowledge, HBM Structures and health literacy for self-medication behavior

Variables		SE	OR	z-value	p-value
Age		**0.010**	**0.994**	**-0.587**	**0.557**
Gender	Male	Referent	Referent	Referent	Referent
	Female	0.247	0.997	-0.120	0.990
Work	Unemployed	Referent	Referent	Referent	Referent
	Manual worker	0.310	0.520	-2.110	0.035
	Employee	0.260	0.756	-1.071	0.284
	self-employment	0.386	0.548	-1.558	0.119
	Retire	0.769	0.116	-2.804	0.005
Insurance	Yes	0.527	0.189	-3.158	0.002
	No	Referent	Referent	Referent	Referent
Knowledge		0.093	1.347	3.216	0.001
HBM	Perceived sensitivity	0.029	1.177	5.558	<0.001
	perceived intensity	0.036	0.862	-4.155	<0.001
	benefits perceived	0.034	0.961	-1.158	0.247
	perceived barriers	0.026	0.992	-0.279	0.870
Health literacy	Functional	0.124	0.998	-0.011	0.991
	Communication	0.142	0.673	-2.794	0.005

Discussion and Conclusion:

In the present study, the level of self-medication was estimated 83%. Self-medication has different frequency and prevalence across various regions and populations. These value in a systematic review in Iran was reported 53% (23), in Tehranian citizens 67% (9), among citizens of southern regions of India 71% (24), in Serbian adults 27.1% (25), and among Khoramabadi elderly 39.4% (26). The difference in the prevalence and frequency of self-medication across different studies can be attributed to different definitions and durations considered for assessing self-medication behavior across various studies, their different populations, as well as cultural differences and divergent beliefs across various regions. Overall, since self-medication is generally high in most populations, it seems that more attention should be paid to this health problem.

The results of the present study showed that most people had self-medication to resolve their cold and headache, with the most commonly used drugs for self-medication being adult cold and different types of painkillers. In a study by Tajik et al. (27) as well as Poureza et al. (28), again consumption of anti-cold medications had high prevalence. In the study by Yazdannasab et al., again most Tehranian citizens (65%) had self-medication to resolve their headache (9). In the study by Poureza et al., cold followed by headache were the most important diseases for which the people self-medicated to mitigate their resulting symptoms (28). Thus, it seems that education in this regard would be useful to modify the behavior of people against self-medication.

In the present study, the most important guide of external action for reducing self-medication and the most important source of information about the proper method of taking medications were physicians and nurses. In the research by Neafsey et al., around half of the participants (46%) acquired their medication information from physicians; 41% read the medication label, and a few (4%) gained their information through TV, and 3% from magazines and friends. Since physicians and nurses are considered the most important source of acquiring drug information for most people and are regarded as an external action guide for preventing self-medication, thus their role of this group of health specialists should be taken into account to modify the self-medication behavior.

Other results suggested that the variables of occupation, insurance coverage status, awareness, perceived susceptibility, perceived severity, and critical health literacy were predictors of self-medication behavior. Accordingly, the unemployed had self-medication significantly more than workers and retired people did. Since the unemployed have no income and suffer unsuitable economic situation, not referring to physicians and practicing self-medication seem to be evident in these people. Meanwhile, although workers and retired people are individuals with poor economic status, they may prefer to consult with healthcare specialists rather than self-medicate because of lack of drug information as well as limited functional health literacy and inability to study the drug brochure. In line with the results of the present study, in the study by Moayeri et al., again self-medication was associated with occupational status of people, with the unemployed claiming the largest share of self-medication (29). Since self-medication is observed more in the unemployed, thus these individuals are more at risk of the complications and damages caused by this behavior, necessitating proper attention by the healthcare system.

Also, those who were covered by insurance, compared to noninsured individuals, self-

medicated less. In line with these results, Karimi et al. also reported that those with no insurance coverage self-medicated 1.41 times as large as their insured counterparts (30). This finding has also been reported by Esmaeilzadeh et al. (31). Since the cost of visit by the physician and other healthcare costs are more for those with no insurance coverage, probably these individuals self-medicate in order to bear less costs. Hence, it seems that those with insurance coverage can act as motivator and direct patients toward better performance regarding self-medication. This requires greater assistance and cooperation by health practitioners, planners, and policymakers.

Based on the other results, those who had more awareness about drugs, their method of use, and their complications, self-medicated more. Possibly, with this information, these individuals felt no need to consult with health specialists, and conceived that they would adopt the best decisions regarding the drugs they use through self-medication. This may also explain why various studies have reported more self-medication among the educated as well as healthcare staff. For example, in the study by Hako et al., the extent of self-medication among medical students was more than 81% (32). Similarly, in the study by Rezabeigi et al., more than 98% of healthcare staff had history of self-medication (33). Thus, although awareness about drugs and their method of consumption are effective factors in healthcare decisions, the people's beliefs about the complications self-medication may bring should be modified.

Other results also showed that those who had greater perceived susceptibility and less perceived severity about self-medication were more likely to self-medicate. Based on these results, although those who considered themselves vulnerable to the complications and side effects of self-medication, they were more likely to self-medicate. This can be due to the fact that these individuals consider themselves as also vulnerable to the sickness and disease that have occurred to them, and they may prefer self-medication and getting rid of the disease over the side effects. Nevertheless, if the severity of incidence of these damages is very serious and dangerous according to the consumer, they are less likely to self-medicate. This finding has also been reported by Bakhtiar et al. (34) as well as Motevalli et al. (35). Since higher perceived severity can have a preventive role against self-medication, and those with this stronger belief practice greater protective behavior for their health (36), consideration and introduction of this issue to educational curricula will be useful to control and modify the self-medication behavior.

In this study, critical health literacy was also a predictor for self-medication behavior. To our knowledge, this is the first study assessing the role of health literacy in various functional, communication, and critical areas in self-medication behavior. Based on the results, self-medication was less in those with greater critical health literacy. Since this literacy is the top level of health literacy and enables people to carefully evaluate health-associated issues before any measures, and weigh all of their aspects and effects, thus individuals make decisions about self-medication with greater sensitivity. Further, since self-medication can be a risky behavior and affect the health of people, thus greater critical health literacy can play a protective role in this regard. Various studies have measured the relationship between health literacy and healthy behaviors such as proper use of medications. Based on them, medication errors and incorrect use of drugs occur more in those with less health literacy (37,38). Since self-medication can be considered a kind of wrong drug consumption, thus based on the

results of this study and other studies, the role of health literacy and especially critical health literacy in proper consumption of medications and refraining from self-medication is inevitable.

Conclusion

Generally, the status of self-medication in studied adults was not suitable, requiring proper interventions and measures to modify this behavior. Meanwhile, since the psychological constructs of perceived severity and susceptibility, awareness, and critical health literacy were the most important factors affecting self-medication behavior, thus it is suggested that these factors are considered in the design of educational interventions to correct and modified the self-medication behavior.

Conflict of Interests: The authors declare that they have no conflict of interests.

Funding: This study funded by Bushehr University of Medical Science

Acknowledgments: This study was based on a research proposal with the code of IR.BPUMS.REC.1396.271 approved by research deputy of Bushehr University of medical sciences. Hereby, researchers highly appreciate this deputy to fund this research.

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