Factors predicting herbal medicine use among reproductive age Iranian women: An application of Socio-ecological Model

Abstract

Introduction: Women are more likely to use herbal medicinal than men. Considering the importance of women's health, particularly in their reproductive age, which is a crucial time for healthy life cycles, the aim of this study was determine the predictors of herbal medicine use among reproductive age Iranian women based on of Socio-ecological Model.

Method: The current study is a cross-sectional study on 190 reproductive age Iranian women from Jahrom city that selected with multi-stage sampling. The data collection tool is a researcher-made questionnaire consisting demographic information and constructs of Socio-ecological Model (SEM). Backward multiple logistic regression was performed to examine the prediction of variables that explain herbal medicine. p-value *<0.*05 was considered statistically significant.

Results: The mean age of the participants was 33.84 ± 9.66 years. Interpersonal factors (OR=1.30, p<0.001), and public policy factors (OR=1.20; p=0. 01) could explain 38% of variance of HM use.

Conclusion: Herbal medicine in reproductive age women is related to psychological and demographic factors. interpersonal factors were recognized as the strongest predictor of herbal medicine. It is necessary for health planners to consider comprehensive factors about herbal medicine use in educational intervention programs.

Keywords: Herbal medicine use, Reproductive age, Socio-ecological Model, Women, Treatment

Introduction

Herbal medicine (HM), as one of the most common and popular complementary and alternative medicine, is increasing worldwide (1). HM that are widely used for both therapeutic and preventive purposes, encompasses a range of elements such as herbs, herbal materials, herbal preparations, and finished herbal products may usually contain natural organic or inorganic active ingredients that are not derived from plants (2). It is estimated that about 80% of the world's population uses HM (3). The findings of some studies in Iran reveal that HM products are used by 65.76% of Iranians (4).

HM is utilized to treat a variety of physical and mental disorders, including chronic pain management (5), psychiatric disorders (6), premenstrual syndrome (7), cancer treatment (8) cardiovascular complications of type II diabetes (9), reproductive health problems such as reproductive ailments, venereal diseases and infertility (10), digestive and sleep problems in newborn (11) and inflammation, and to boost the immune system (12). Because HM does not have a specific dose like conventional drugs, if a large amount of these is used, the consumer's health could be in danger and acute or chronic poisoning could happen (13). The diagnosis and duration of the disease may also be delayed and prolonged by the self-treatment with HM (14).

A number of factors have contributed to the use of herbal medicines, including female gender, insufficient knowledge about herbal medicines, history of chronic disease, social and cultural influences, socio-demographic characteristics, the perception that herbal products are safe and their availability, high price of modern healthcare and poor access to public health systems (15-17). In addition, the belief that natural medicines are healthier and safer has led to an increase in the use of herbal medicine as a self-treatment method (3). Studies have indicated that the source of information about HM is also important. Most consumers of HM are influenced by family members, friends and relatives, advertising, traditional doctors, internet and social networks. The findings of Nsibirwa et al. in Uganda showed that 76.2% of herbal medicine users were influenced by family members. Media like television, radio, and newspaper, resulting in an influence of 52.5% and other sources of information included their friends (23.8%); herbal practitioners (9.1%); and community elders (5.6%) (18). Alqathama et al also showed that most of the participants trusted their family and friends (50.6%), social networks (23.7%) and the internet (15.9%) when it came to self-medicating with herbs (19).

It is particularly important to identify the factors that influence people's decisions to perform health-related behaviors. A comprehensive model that encompasses all the factors related to health behavior is required to examine these factors. The ecological model is a useful model for better

understanding factors that can identify different levels of individual, interpersonal, organizational and public health policies. SEM focuses on the interaction and interdependence of factors at all levels of a health problem. In some health studies, SEM has been recognized as a successful framework (20-22). This model consists of 5 sphere of intervention including individual; interpersonal; organizational; community; and public policy. Each of these levels, interact with each other and are independently effective on behavior. Bio-psychological factors like age, gender, and personality, knowledge and attitude are part of the intrapersonal sphere. An individual's interactions with others (family, friends, relatives, health staff) is also part of the interpersonal sphere. The organizational (including institutional settings, and affordances) sphere has the potential to influence individuals through social institutions. The community and public policy sphere represents encompasses variables such asincluding social and cultural norms and values; and policy about legal access to medicine and health care policies at the macro level (20, 21, 23). The SEM spheres are presented in Figure 1.

Factors that affect the consumption of HM have been investigated in some studies, but comprehensive behavioral models like the ecological model have not been utilized in studies. Women are the main consumers of HM according to the evidence, and reproductive age (15-49 years) is an important and effective period in women's life cycle, which is a basis for healthy aging. So the aim of this study was to investigate factors predicting herbal medicine use among reproductive age Iranian women using Socio-ecological Model (SEM).

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and writing literacy, the ability to communicate properly, living in Jahorm city, being in the age group of 15-49 years, and not having any chronic diseases.

A random cluster method was employed to perform the sampling. Out of the eight urban health centers in Jahrom, four centers were selected as a cluster and then from each cluster, the list of people who meet the inclusion criteria was extracted. According to the table of random numbers, 48 reproductive age women selected from each health center; and a total of 190 women included in the study. Sample size was calculated considering the confidence level of 95%, $Z_\alpha = 1.96$, $Z_\beta = 0.84$, d = 0.1 and 0.67 for standard deviation (obtained from a pilot study). This gives a sample size of 172 participants that to increase the study power, 190 women were considered in this study. The formula for calculating the sample size is as follows: $n=Z^2\delta^2/d^2$.

Data collection Instrument

Data collection tools included a researcher-made questionnaire including questions about demographic information (6 items) and questions related to SEM constructs including individual factors (9 items), interpersonal factors (5 items), organizational and community factors (7 items), public policy factors (8 items). The Likert scale was used to score all constructs, ranging from completely disagree=1 to completely agree=5, and each question was assigned a score from 1 to 5. Also, the HM use was measured with 1 items in which the participants were asked to state their HM use. The validity of the questionnaire was measured by a panel of experts, which consisted of 10 health education experts, using the content validity method and Content Validity Ratio (CVR) and Content Validity Index (CVI) was calculated. Cronbach's alpha analysis was used to achieve reliability in a population similar to the target group. Questionnaire items based on SEM, CVI, CVR and Cronbach's alpha were shown in Table 1.

Table 1. Questionnaire items based on SEM, CVI, CVR and Cronbach's alpha

Constructs of SEM	CVI	CVR	*Cronbach's alpha*
Individual factors	0.80	0.83	0.80
1. HM have fewer side effects than chemical medicines			
2. Using HM is easier compared to using chemical ones			
3. HM can only be used as a complementary			
4. HM are less costly than chemical medicines			
5. All diseases, even incurable cancers or other late-stage disease, can be treated with HM			
6. HM are more effective than chemical medicines			
7. HM are natural and more compatible with the body			
8. Interaction between HM and chemical medicines can occur			
9. HM are only utilized for simple ailments like colds.			
Interpersonal factors	0.88	0.84	0.83
1. HM are commonly used in our family			
2. My family encourages me to use HM			
3. My friends always recommend using HM			
4. In our parties and gatherings, it is common to use some herbal teas			
5. Health care staff recommend the use of HM as complementary medicine.			
Organizational and community factors	0.79	0.83	0.82
1. All kinds of HM are easily accessible in our city			
2. The high costs of visits and prescriptions of specialist doctors have caused people to self-medicate with HM.			
3. It is necessary to officially consider the use of HM in the health system as a part of complementary medicine			
4. There is no specialists in traditional medicine in our city to consult them about the use of HM.			
5. Our religious institutions recommends the use of HM			
6. HM use are considered desirable by the people of Jahrom's culture			
7. The use of herbal medicines has been included in Iranian culture and medicine since ancient times.			
Public policy factors	0.80	0.85	0.78
1. The use of HM is widely advertised on radio and television.			
2. There are many websites that provide true or false information about the use of HM			
3. Scientific articles about the usefulness of using HM are published every year, so people rely on it for arbitrary consumption.			
4. Providing a brochure on the use of HM and their side effects is a necessary action by the government			
5. Attaries and centers that sell HM are not supervised by the Ministry of Health.			
6. The health policy makers of our city do not care about the issue of using HM			
7. Selling HM to the public without a license, is not punishable under the law.			
8. The government does not have strict rules for licensing Attaries and centers selling herbal medicines.			
HM use regularly			
Yes	0.81	0.90	0.79
No			

Statistical Analysis

Data analysis was performed using SPSS 25 software. We applied the odds ratio (OR) and corresponding 95% confidence intervals (95% CI) to examine the univariate relationships between the independent variables and herbal medicine utilization. Variables with p-values less than 0.20 in the univariate model were chosen for inclusion in the multivariate model. Adjusted ORs were estimated using backward multiple logistic regression to control for the effects of potential confounding variables. The significance level was set at 0.05

Results

The findings of the study showed the mean age of the participants was 33.84 ± 9.66 years. In terms of education level, 15.8% were under diploma, 24.2% had diploma and 60% had academic

education. Of total, 72.1% were housewives, 17.9 were employees, and 10% were self-employed. Also, 70% of women were married. The monthly family income of most women (66.3 percent) was reported at the average level and 9.5% and 24.2% reported low and high economic status, respectively. Only 14.2% of them reported a history of underlying disease. 149 women (78.4 percent) reported using HM regularly.

Table 2 presents the frequency of reasons and ways to use HM. The most reasons for using HM in women were cold and sore throat (n=148), stomach pain or heartburn (n=129), constipation or diarrhea (n=89) respectively. participants reported consuming HM mostly as herbal tea (n=130).

Table 2. Frequency of reasons and ways to use HM (n = 190)

Variables		N
Reasons for HM use	Cold and sore throat	148
	Stomach pain or heartburn	129
	Headache	32
	Constipation or diarrhea	89
	Flatulence	53
	Menstrual problems	79
	Fatigue and sedative	79
	Prevention of osteoporosis	9
	Lower blood pressure	15
	Reducing blood fat	15
	Decrease in blood sugar	11
	Reduce cough	79
	Insomnia	30
	Ear pain	11
	Anti-inflammatory, muscle swelling	6
	Increased libido	4
	Urinary tract infection and kidney problems, kidney stones	20
	Skin problems (acne, removal of darkness)	24
	Weight loss	26
	Vaginal infections	29
	Mental problems such as anxiety and depression	14
Ways to use HM	Herbal Tea	130
	Herbal decoction	52
	Herbal Essences	88
	Raw form	20

Table 3 shows the univariate association of independent variables with herbal medicine utilization. The unadjusted results revealed a significant association between herbal medicine utilization and marital status, income level, and all constructs of the SEM model ($p<0.05$).

However, after adjustment using backward logistic regression, significant associations were only observed regarding the interpersonal and political constructs of the SEM model (Table 4).

Table 3: Univariate associations of independent variables with herbal medicine utilization

Variable		Number (%)/Mean±SD	OR* (95% CI)	P
Age		33.84±6.99	0.98 (0.95-1.02)	0.40
Marital status	Single	57 (30)	-	-
	Married	133 (70)	0.45 (0.22-0.92)	0.03
Education	Primary school	30 (15.8)	-	-
	High school	46 (24.2)	0.49 (0.14-1.64)	0.25
	Collage	114 (60.0)	1.07 (0.41-2.75)	0.88
Employment status	Housekeeper	137 (72.1)	-	-
	employee	34 (17.9)	1.34 (0.56-3.18)	0.50
	self-employed	19 (10)	0.69 (0.19-2.56)	0.58
Child number	0	72 (37.9)	-	-
	1	37 (19.5)	1.36 (0.56-3.33)	0.49
	1<	81 (42.6)	0.61 (0.27-1.38)	0.24
Income level	Low	18 (9.5)	-	-
	Medium	126 (66.3)	1.69 (0.36-7.89)	0.50
	High	46 (24.2)	4.69 (0.95-22.93)	0.05
History of underling disease	Yes	27 (14.2)	-	-
	No	163 (85.8)	2.43 (0.69-8.52)	0.16
SEM model constructs	Individual factors	24.53 (4.99)	1.23 (1.13-1.34)	<0.001
	Interpersonal factors	11.77 (3.84)	1.39 (1.24-1.57)	<0.001
	Organizational and community factors	15.15 (3.80)	1.21 (1.09-1.34)	<0.001
	Public policy factors	17.97 (4.73)	1.16 (1.07-1.26)	<0.001

* Univariate Odds Ratio (OR) and corresponding 95% confidence interval (C.I) computed using logistic regression models.

Table 4: Adjusted associations of independent variables with herbal medicine utilization

Variable		Number (%)/Mean±SD	OR* (95% CI)	P
SEM model constructs	Individual factors	24.53 (4.99)	1.10 (0.99-1.21)	0.061
	Interpersonal factors	11.77 (3.84)	1.30 (1.13-1.49)	<0.001
	Public policy factors	17.97 (4.73)	1.20 (1.02-1.22)	0.016

* Adjusted Odds Ratio (OR) and corresponding 95% confidence interval (C.I) computed using a backward logistic regression model. Multiple logistic regression adjusted R^2=0.382

Discussion

The result of study showed that interpersonal factors and public policy factors could explain 38% of variance of HM use and interpersonal factors were recognized as the strongest predictor. In some research, behavioral theories and models have been used as an appropriate framework to predict

complementary medicine such as HM. For example, Rochelle et al, applied Theory of Planned Behavior to explain use of traditional Chinese medicine among Hong Kong Chinese in Britain. It was demonstrated that gender, age, Chinese cultural attachment, subjective norms, and recent use of traditional medicine utilization accounted for 25.3% of explained variance of traditional Chinese medicine (24). Furthermore, the results of Afriyie et al, showed living in a district and being older than 20 years, having the opinion that herbal medicines work very well or work somehow, and having the belief that one could definitely or maybe use herbal medicine with ease, could predict HM use in Ashanti Region of Ghana based on Health Belief Model (25). Although individual factors such as people's attitudes and beliefs are significant in the use of complementary medicine, the role of other factors such as social and structural factors and health policies have been discussed in few studies. The SEM can provide a more comprehensive framework for investigating HM use.

According to the results of this study, interpersonal factors, as the strongest predictor among SEM constructs had a positive and direct relationship with HM use. In some studies, it has been considered that family, friends, and health staffs play a role in arbitrary taking or not taking herbal medicines. Mountifield et al, showed that more than 50% of Australian patients' family or friends used complementary and alternative treatment for any health purposes and this factor was a predictor of regular complementary and alternative therapy in inflammatory bowel disease (26). Also Karimian et al., stated that taking herbal medicine among Iranian pregnant women is more likely to be used if family members and friends acknowledge it (27). Bayisa et al., concluded due to the lack of integration of traditional medicine in the Ethiopian health system, women get their information about herbal medicines through family and neighbors, as a result, this leads to an increase in their self-treatment. According to their report, only 14.29% of women have been given health advice by healthcare personnel and this may indicate healthcare workers are not effectively consulted about alternative therapies or health care staffs may be reluctant to give advice in such matters, or both (28). Family members and friends, plays an important role in determining whether or not health-related behaviors is created, therefore, it is important to pay attention to these factors in educational interventions to reduce the self-treatment with herbal medicines in reproductive age women. Health care workers also should be informed about the indications, limitations and side effects of HM, to be able to advise reproductive age women about the appropriate HM therapy that do not conflict with modern medical prescriptions and are provided as complementary medicine.

The findings of this study showed that although individual factors had a statistically significant relationship with HM, it could not predict at the last stage. The use of HM has been investigated by examining individual factors such as knowledge and attitude or beliefs in some research. Findings of the study conducted by Kristianto et al., showed that having knowledge about HM was positively linked to HM use and holistic health beliefs and pro- complementary alternative medicine attitudes were also found to be independently associated with HM use (29). There are some studies show that individual factors such as female gender are related to increasing the use of HM. Also, some beliefs such as that herbal medicines can be used to promote health and treat diseases, are safe and can be used with conventional or allopathic medicines have been reported as common beliefs of people (15). It seems that health education strategies, such as holding educational workshops in health centers and providing tailored educational materials about how to use and the possible consequences of using HM, and creating group discussions about the reasons and motivations of reproductive age women, can be a suitable solution to ensure taking into account individual factors in relation to appropriate HM.

Public policy factors were also directly related to HM use and was another significant predictor in this study. According to the World Health Organization's global survey, about 64 percent of member states (around 124 country) reported having laws or regulations regarding herbal medicine. Also the registration system for herbal medicines has been reported by approximately 65% of them (30). However, in many countries, there are still no specific laws for the use of HM in the health system or there are no necessary supervisions for the people who sell these drugs. The findings of the study by Demeke et al., indicated that there were no defined policies, laws or registration for HM in Ethiopia. They also reported traditional healers claimed that they are licensed by health system to legally practice traditional HM, but no traditional healer is licensed by Ethiopian Food and Drug Administration or Ministry of Health. In Iran, traditional medicine has recently been officially integrated into the health system by the Ministry of Health. The purpose of this action is to use the knowledge of traditional medicine specialists and scientific resources in this field, along with modern medicine, to prevent disease. The increase in demand for HM, particularly in developing countries,

and the consequences of their improper use, necessitated health policy makers to reasonably update their HM policies to protect the general community.

Although organizational and community factors (such as costs of modern medicine, easy access to HM and encouraging culture in the community), were not among the predictors; it was significantly associated with HM similar to other studies. Asare et al., stated doctors' prescription, HM affordability, willingness to use HM and availability of them, were facilitators of using HM in Ghana (16). On the other hand, the findings of the study by Rochelle et al., showed that respondents with strong attachment to Chinese culture were more likely to use traditional complementary medicine and express satisfaction with TCM services (24).

The results of study indicated that using HM was higher in married women and participants without a history of underling disease, but it was not related to other socio-economic variables. Demographic and socio-economic factors related to HM use has been studied in some researches. Kretchy et al., showed that all the sociodemographic characteristics (including age, religion, marital status, educational level and employment status) except for sex were significantly associated with the use of HM among Ghanaian adults (31). Zaidi et al., also showed a significantly higher number of the chronic disease patients were using HM, whereas individuals with no medical problems were least commonly using herbs. These differences can be due to a variety of factors including, sample size, geography and socioeconomic status of studied population .It is important that these variables are also considered in interventions to improve reproductive age women's health.

Strengths and limitations

The strength of this study is the use of a valid and reliable researcher-made questionnaire with a comprehensive theoretical framework based on SEM which is an appropriate model for finding out factors related HM use in community members. One limitation of the study is the use of a self-report scale and therefore the participants' responses may have been subject to their personal interpretations. To address this problem, the instrument has been continuously reviewed by a panel of experts in order to develop a comprehensive questionnaire. In addition, participants in this study were selected from reproductive age women in urban areas, and it is therefore recommended to replicate the study among people in the rural or other cultural settings or age groups.

Conclusion

Herbal medicine in reproductive age women is related to psychological and demographic factors. interpersonal factors were recognized as the strongest predictor of herbal medicine. It is necessary for health planners to consider comprehensive factors about herbal medicine use in educational intervention programs based on a proper framework such as SEM.

Abbreviations

HM= Herbal Medicine, SEM= Socio-ecological Model, CVR=Content validity rate, CVI=content validity index.