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Self-medication among health staff: A cross sectional study of Kerman Province, Iran

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ABSTRACT

There is a growing concern about the negative consequences of self-medication on communities. This is more important in healthcare workers who are assumed to be propagators of proper medication administration. This study focuses on self-medication status among health staff and its related factors. This cross-sectional study was performed on 400 employees who were selected through multistage sampling from a health center in Kerman, Southeast of Iran, in 2014. Data were collected through a self-report questionnaire, whose face, content, and construct validity (α=0.73) and test retest reliability were confirmed (Mean ICC=0.71 to 0.73). The questionnaire consists of demographic factors, the amount of physician visits when feeling ill or pain, influencing factors like subject's knowledge and attitude toward self-medication, sources of drug supply for self-medication, information resources, and types of self-medication drugs. Data analysis was performed using descriptive statistics and Mann-Whitney and chi-square tests. More than 98% of the subjects had a history of self-medication. Most drugs used were analgesics (85.5%), herbal drugs and distillates (82.2%), and cough and cold medicines (82%), and the lowest consumed drugs included psychotropic (4%) and stimulant (4.8%) drugs. The most important related factors were health seeking behavior of staff in terms of amount of patient visits and past experience of self- medication. Self-medication is prevalent among health system staff. Then, planning to prevent self-medication including strict regulation of OTC (over the counter) sale and exert greater oversight on pharmacies' performance to control sell of unprescribed drug seems necessary.

Key words: Self-medication; Health staff; Nonprescription drugs; OTC; Drug Knowledge

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INTRODUCTION

Today, scientific and industrial developments in the medicine and pharmaceutics have made accessible a variety of drugs and if the access is not according to proper drug consumption pattern, it can produce excessive and indiscriminate use of drugs [1]. Self-medication is referred to preparation and use of one or more synthetic or herbal

drugs without a physician's diagnosis or prescription, or health monitoring [2]. It can cause many problems such as waste of resources, adverse effects, drug dependency, and microbial resistance [3]. In addition, individuals' mistakes in diagnosis, inadequate or excessive drug dosage, improper duration of treatment, and drug interactions can cause problems and aggravate the disease through temporary relief of symptoms and masking the underlying disease [4, 5].

Studies have indicated a high prevalence of self-medication around the world; this has led to public concern in irrational use of drugs. The prevalence of self-medication in Europe is reported 68%, while it is higher in developing countries. For instance, the prevalence of self-medication has been reported 92% in Kuwait and 76% in Karachi [6]. Several factors are involved in the increase of self-medication such as lifestyle and access to medicines [6]. In addition, factors such as gender, race, occupation, health status, high cost of physician visits, shortage of time, lack of access to health systems, and physician shortages play a crucial role in self-medication [7]. In this regard, the role of the medical authorities, manufacturers, educational system, the media, communities, patients, and health care workers cannot be denied [8].

In Iran, the prescription of drugs is inconsistent with the population and epidemiological situation of diseases; this can be due to self-medication in the community [9]. Unfortunately, the rate of self-medication is three times of the global average [10]. According to the World Health Organization, Iran is among the first 20 countries in the world and is the second to China in Asia in terms of drug use [11, 12].

According to studies, 83.3% of Iranians arbitrarily consume drugs [10] and each of them consumes 339 drugs annually that are more than international standard [13]. Studies show that 65% of disease burden is because of failure to comply with the proper pattern of prescription and irrational use of medicines, so that the national health system is still facing with the problem of indiscriminate, inappropriate, and arbitrary use of drugs [12]. This is serious risk for the health of society and its resolution requires raising awareness of general population.

Studies conducted among healthcare workers throughout the world show that self-medication is high among this group of people, despite knowing the side effects. For example, in Brazil, 91% of nursing students agreed that self-medication is a threat to health; however, only 13% of them were taking medications as prescribed [5]. In Croatia, 68% of professional health employees had a home pharmacy to store medications; 37% of households had at least one drug at home; and 27% of households had expired drugs [4]. The study conducted by Gholap et al in India also showed that 80.13% of female and 63.63% of male nurses reported self-medication [14].

Objective

Given that several studies have reported the prevalence of self-medication among healthcare staff in different societies, this study aimed to determine the prevalence of self-medication and related factors among healthcare staff in a city of Iran to help developing national preventive programs.

MATERIALS AND METHODS

3. Patients and Methods

3.1. Study population and study area

This cross-sectional study was carried out on 400 employees of the Health Center of Kerman city who were selected through the multistage sampling method from June to August 2014. Since half of these employees are working in Kerman city and the other half in subsidiary units in other districts, half of the subjects were systematically selected from the Kerman Healthcare Centers and the remaining from the 10 districts covered by the city.

3.2. Data collection

The data were collected using a questionnaire constructed based on the existing valid questionnaires [10, 17]. It was completed through self-report and consisted of four parts: 1-demographic factors [gender, marital status, type of employment, education, work experience, and supplemental insurance], 2-the amount of physician visits when feeling ill or pain[rated on a five-point Likert scale anchored at 1 = never and 5 = very often], 3-factors affecting self-medication [rated on a five-point Likert scale anchored at 1= very little influential to very much influential], 4-sources of supply of drugs for self-medication, information resources, and types of medication for self-medication [yes, no questions].

Content validity was determined using the opinions of a panel of experts consisting of professional in health education, epidemiology, health services management, and pharmacists. To determine the face validity, readability, clarity, and cultural appropriateness, the questionnaire prototype was completed by ten employees with different levels of employment and education, and their remarks were reviewed by the expertise team and considered in the

final version. An exploratory factor analysis was used for construct validity of items regarding the factors affecting self-medication. Structural factor analysis was used to further ensure accurate placement of the items and their classification in correlated groups. The internal consistency was measured at first via Kaiser-Meyer-Olkin coefficient and the Bartlett's test, followed by calculation of the factor pattern matrix. Oblique rotation was used for this calculation and constructs with eigenvalues of more than one were selected. To calculate the score for each construct, the items with loading factor of more than 0.4 were selected and used in the calculations [Table 4].

Reliability of the questionnaire was determined via Test-retest. It was performed on 20 subjects of the study population with 12-14 days interval, and items with an Intra-class correlation reliability coefficient [ICC] of lower than 0.4 were excluded from the questionnaire. ICC of items related to the amount of physician visits when feeling ill or pain ranged from 0.67 to 0.87[Mean= 0.73] and their Cronbach's alpha was equal to 0.70. ICC of remained items ranged from 0.47 to 0. 89[Mean= 0.71]. After obtaining the subjects informed consent, they completed the questionnaire. The duration of response was 15 to 25 with an average of 20 minutes, and the response rate was 98%.

3.3. Data analysis

The data were analyzed with SPSS-22 using descriptive statistics and chi-square and Mann-Whitney tests at a significance level of 0.05. Standardized score for amount of physician visits ranged from 0 to 20. Score lower than 10 were considered as weak, 10-14 as moderate, 14-17 as good as and higher than 17 as excellent.

3.4. Ethical statement

This study was approved by the institutional research board and ethics committee of Kerman University of Medical Sciences [code no.93.33]. Informed consent obtained from subjects prior to study. Anonymity of participants was preserved. Also, in all stage of research, the Declaration of Helsinki was followed.

RESULTS

4.1. Construct validity of questionnaire

All items regarding factors related to self-medication in the questionnaire had acceptable internal consistency with each other [KMO coefficient =0.95, Bartlett's Test: 3.01, P_{value} <0001], and they were suitable for factor analysis [Table 4]. The items were loaded in three constructs which explained 53.5% of the variances; they included individual's knowledge and experience of self-medication [Factor 1], individual's attitude toward the consequences of self-medication [Factor 2], and lack of physical and financial access to physicians [Factor 3]. Cronbach's alpha showed that the internal consistency of the Likert's scale items was acceptable. The lowest amount was 0.7 for the lack of physical and financial access to physicians construct and the highest was 0.73 for the individual's knowledge and experience construct [Table 1]. Cronbach's alpha of the whole questionnaire was 0.73.

Table1: Rotated Component Matrix for variable solution [the factors effecting on nonprescription drugs consumption] [n=396]

Items	Knowledge and experience of self-medication	Attitude toward the consequences of self-medication	lack of physical and financial access to physicians
Relative scientific knowledge about drugs	.57	-	-
Access to drugs [Pharmacies, home,…]	.57	-	-
Self-diagnosis and knowledge on treatment	.76	-	-
Experience of special diseases [Such as seasonal allergies, Migraine, Gastritis,…] and knowledge on treatment	.70	-	-
Success of previous self-medication	.71	-	-
Considering disease as non-important issue	-	.66	-
Beliefs about safety of drugs	-	.72	-
Insufficient knowledge about side effects of drugs	-	.60	-
Advices of friends or colleagues	-	.54	-
High cost of physician visits	-	-	.69
Limited access to physicians in emergency situations.	-	-	.49
Lack of supplemental insurance	-	-	.72
Initial Eigenvalues	3.83	1.55	1.04
Cronbach's alpha	.72	.71	.70
Percentage of explained variance	31.88	12.92	8.69
Mean ICC	.71	.74	.64

Factor 1: Individual's knowledge and experience of self-medication
Factor 2: individual's attitude toward the consequences of self-medication
Factor 3: lack of physical and financial access to physicians

Table 2: Frequency of nonprescription drugs consumption among participants

Types of drugs	No [%]
Analgesics	342 [85.5]
Herbal drug and distillates	329 [82.2]
Cold and cough medicines	324 [82]
Antihistamines [Loratadine, Diphenhydramine, Dimenhydrinate,…]	230 [57.5]
Gastrointestinal drugs including [Antacids, Ranitidine, Omeprazole,…], Laxatives, Antidiarrhoeals,…	225 [55.8]
Vitamins, Minerals, Dietary supplements and energizers [Iron, Protein Powders, Creatine, …]	222 [55.5]
Antibiotics	159[39.8]
Antidepressants [Fluoxetine, Citalopram,…] and Antianxiety [Diazepam, Alprazolam,…]	67[16.8]
Drugs for treatment of hair and skin disorders	58 [14.5]
Hormones [contraceptives, anabolic steroids,…]	35[8.8]
Cardiovascular drugs	21 [5.2]
Stimulants [Ritalin,. ..]	19 [4.8]
Psychotropic drugs and synthetic opioids [Tramadol, Methadone,…]	16[4]

Table 3: Frequency of nonprescription drugs suppliers among participants

Suppliers	No [%]
Pharmacies	305[76.2]
In-home drug storage	269[67.2]
Groceries, apothecary	247[61.8]
Family, friends, relatives	131[32.8]
Selling agent [such as bodybuilding supplements selling agency]	30[7.5]
Club coaches	26[6.5]
Barbers	21[5.2]

Table 4: Frequency of information source on drugs among participants

Source of information	No [%]
Physicians	301 [75.5]
Books and written sources [brochures, magazines, journals, etc.]	294 [73.5]
Personal scientific information	287 [71.8]
Personal experiences	273 [68.2]
Radio and TV	264 [66]
Internet	237 [59.2]
Colleagues	232 [58]
Apothecary and traditional healers	224 [56]
Family, friends, relatives	210 [52.5]
Pharmacists and pharmacy clerks	192 [48]
Other patients with similar condition	141 [35.2]
Previous prescribed orders	155 [28.8]
Beauticians and fitness instructors	379.2]

4.2. Demographic characteristics

The mean age of the subjects was 37.50±7.68 years; of them, 309 [77.2%] were female and the remaining were male, 84% were married and 16% were single. Regarding education, 174 [43.5%] had a Bachelor's degree, 21 [5.3%] Master or higher, 68 [17%] associate degree, 80 [20%] diploma, and 58 [14.5%] under diploma. All subjects were covered by the basic insurance; of whom, 159 persons [40%] had also supplemental insurance.

4.3. Self-medication and related factors

More than 98% [n=393] of the subjects had a history of self-medication. The most drugs consumed arbitrarily included analgesics by 342 subjects [85.5%], herbal medicines and extracts by 329 subjects [82.2%], cough and cold medicines by 324 subjects [82%] and the lowest were psychotropic [4%] and stimulant [4.8%] drugs [Table 2]. The most prevalent sources of drug supply for self-medication included pharmacies [76.2%] in-home drugs storage [67.2%] and the lowest were barbers [5.2%] and club coaches [6.5%] [Table 3]. The first reported source of information were physicians for 301 subjects [75.5%] and written sources for 294 subjects [73.5%], and lowest were beauticians and fitness instructors [9.2%][Table 4].

Regarding to amount of physician visits, 212 participants [53%] had moderate, 132 [33%] had good, 30[7.5%] had excellent and the 26 remaining participants [6.5%] had weak amount of physician visits. Also, a significant relationship was found between amount of physician visits and self- medication. So that, the higher scores on physician visits indicated a lower report of self-medication [P< 0.0001]. Our result showed that 42.9% of participants with self-medication had a supplemental insurance compared with 57.1% of those without supplemental insurance. So, there was no significant relationship between self-medication and insurance status [P=0.86].

The relationship between consumption of nonprescription drugs and constructs derived from factor analysis was also examined. The mean, standard deviation and significance of relationship between the consumed drugs and the

questionnaire's constructs was calculated using Mann-Whitney test and is shown in Table 5. According to results, there was a significant statistical relationship between the scores of the subjects in each construct and higher consumption of the nonprescription drugs.

The mean Score of knowledge and experience of self-medication among those who had a history of self- medication was very lower than whom not having such history [P<.0001]. Furthermore, a difference existed between the scores of the subjects in other variables and the use of medications, although there wasn't a significant correlation. For example, the more the score of the subjects in lack of access to physicians, the higher the possibility of using nonprescription medications [Table 5].

Table5: Relationship among contributing factors in self-medication and drug consumption

Variables / Drug		Knowledge and experience of self-medication		Attitude toward the consequences of self-medication		Lack of physical and financial access to physicians		Physician visits when feeling ill or pain	
		Mean±SD	P_{value}	Mean±SD	P_{value}	Mean±SD	P_{value}	Mean±SD	P_{value}
Antibiotics	Yes	13.63±3.50	<.0001	10.67±3.21	<.0001	8.77±2.76	<.0001	3.26±.0.54	<.0001
	No	11.63±2.76		8.74±3.21		7.59±2.81		3.54±0.60	
Cold and cough medicines	Yes	12.87±3.16	<.0001	9.85±3.23	<.0001	8.26±2.76	.005	3.35±0.55	<.0001
	No	10.48±3.54		8.03±3.42		7.17±3.05		3.79±0.62	
Analgesics	Yes	12.83±3.15	<.0001	9.80±3.25	<.0001	7.10±2.97	.01	3.39±0.57	<.0001
	No	10.02±3.57		7.83±3.38		8.21±2.80		3.72±0.65	
Gastrointestinal drugs including Antacids]Ranitidine, Omeprazole,…,[Laxatives, Antidiarrhoeals,…]	Yes	13.22±3.26	<.0001	9.78±3.29	.11	8.39±2.90	.02	3.32±0.53	<.0001
	No	11.41±3.14		9.15±3.38		7.62±2.72		3.57±0.62	
Drugs for the treatment of hair and skin disorders	Yes	13.48±3.55	.01	10.43±3.48	.04	8.67±2.58	.04	3.30±0.55	.04
	No	12.24±3.30		9.35±3.30		7.95±2.88		3.46±0.59	
Cardiovascular drugs	Yes	13.71±2.91	.05	12.09±3.55	.002	7.95±2.82	.005	3.21±0.56	.90
	No	12.35±3.37		9.36±3.28		9.86±2.78		3.45±0.60	
Antihistamines [Loratadine, Diphenhydramine, Dimenhydrinate,…]	Yes	13.22±3.09	<.0001	10.01±3.35	.001	7.67±2.82	.05	3.35±0.57	.02
	No	11.33±3.41		8.82±3.22		8.33±2.84		3.56±0.58	
Vitamins, Minerals, Dietary supplements and energizers [Iron, Protein Powders, Creatine, …]	Yes	13.04±3.26	<.0001	9.82±3.35	.041	8.33±2.75	.04	3.54±0.57	.002
	No	11.64±3.32		9.11±3.31		7.70±2.94		3.55±0.58	
Antidepressants [Fluoxetine, Citalopram,…] and Antianxiety [Diazepam, Alprazolam[…,	Yes	13.25±2.94	.01	10.40±3.48	.02	8.67±2.91	.08	3.24±0.50	.004
	No	12.25±3.42		9.33±3.28		7.93±2.82		3.47±.60	
Stimulants [Ritalin, ..]	Yes	12.47±3.42	.90	11.36±3.28	.01	9.31±2.62	.06	3.21±0.56	.01
	No	12.41±1.64		9.41±3.32		8.00±2.75		3.45±0.60	
psychotropic drugs and synthetic opioids [Tramadol, Methadone[…,	Yes	13.31±2.44	.16	11.62±2.47	.006	9.18±1.87	.07	3.28±0.57	0.001
	No	12.38±3.39		9.42±3.48		8.00±2.87		3.44±0.60	
Hormones [contraceptives, anabolic steroids,…]	Yes	13.65±3.26	.02	10.89±2.76	.006	8.71±1.90	.10	3.24±0.57	.06
	No	12.30±3.35		9.37±3.37		7.99±2.92		3.45±0.60	0.001
Herbal drugs and distillates	Yes	12.77±3.31	<.0001	9.66±3.28	.08	8.21±2.84	.04	3.40±0.60	<0001
	No	10.90±3.04		8.86±3.31		7.35±2.77		3.57±0.62	
Total self- medication	Yes	7.28±3.63	<.0001	6.30±4.07	.01	5.42±2.30	.0001	3.22±1.00	.001
	No	12.52±3.28		9.56±3.30		8.10±2.84		4.5±.64	

DISCUSSION

In this study, almost all health center staff reported self-medication. This very high incidence is consistent with the results of self-medication study among Palestinian students [98%] [15], however it is higher than the prevalence reported in Malaysia as 77.6% [16]. The results of this study compared with similar studies in Iran, indicated the very high prevalence of self-medication among healthcare staff as compared with other groups. For example, the prevalence of self-medication was 83% among students in Ardabil city [13], 61.5% among general population in Rasht city [17], 31% among the elderly in Zarandieh city[9], and 12% among pregnant women in Arak city [18]; that shows differences in the prevalence of self-medication in various target groups. The results of our study are confirmed by high prevalence of self-medication amongst students in Pakistan [95.5%] [19], Nigeria [91.4%] [20], Hong Kong [94%] [21], and in students of Medical Sciences in Birjand [92.1%] [22] and Yazd [83%] [23].

Studies pointed out that high prevalence of self-medication among educated health center staff arises from the possibility of access to information and trust to their knowledge about the disease and medications [14]. In spite of that, current study showed that knowledge and attitudes of staff toward negative consequences and adverse effects of self-medication were significantly higher in participants who had not a history of self-medication than those who had a history of self-medication. Our results, in consistence with the study of Pourreza et al., revealed that the reason for low prevalence of self-medication in medical students is their higher scientific knowledge about the self-medication [10]. Similarly, study of self-medication in Ardabil in north-western Iran showed that the prevalence of self-medication in medical students was less than non-medical students, so that 26.4% of medical students and 73.6% of non- medical students had obtained nonprescription drugs from pharmacy [13].

In contrast, some studies reported high prevalence of self-medication among medical students [5, 22]. These difference may be attributed to the study sample size, economic status, cultural factors and students' familiarity with disease and treatment. As reported in a study in India, 80.30% of nurses stated that their self-medication was due to their knowledge of medicines and treatment methods [14]. Furthermore, in a systematic review study in Greece, the prevalence of self-medication among physicians and medical students reported over 50% among 76% of included studies. Job conditions and relation to medical sciences may explain this high prevalence. As shown in the study of self-medication in Malaysia, healthcare workers are more prone to self-medication because of their working conditions [16].

Unlike the present study, indiscriminate and inappropriate use of drugs was higher among the low literacy and social class population in the study of Sahebi in Tabriz in the northwest of Iran [24] and a study on self-medication patterns among women in Nigeria [7]; such difference may be due to performance of the study in general population, while our research was conducted on the healthcare workers.

In this study, there was a negative significant relationship between the amounts of physician visits when feeling ill or pain and self-medication. In two related studies in Iran, important reasons for self- medication were reported as not feeling the need to physician visits for minor ailments and low severity of symptoms. In the current study, lack of physical and financial accessibility of physicians is one of the reasons for the self-medication. In many studies [11, 16, 18, 27] better economic status is associated with lower self-medication. However, in a study in India, only 2.38% of nurses reported financial problems and lack of access to services as causes of self-medication [14].

Regarding the way of access to nonprescription drugs, 76% of the respondents reported buying from pharmacy and 68% using In-home drug storage. In the study of Baghiani-Moghadam and Ahrampoosh, 70% of the students stated that the reason for self-medication was sale of nonprescription drugs by pharmacies [23], indicating easy access to medicines. According to the results of this study, the arbitrary use of analgesics, cold and cough medicines, and herbal distillates was very high. In a study conducted among medical students in Egypt, analgesics [87.3%] and herbal medicines [72%] were the highest drug used for self-medication [6], which corresponds with the results of our study. Unfortunately, the arbitrarily use of analgesics is reported prevalent in most of the studies in Iran and the world [6, 16, 17, 22, 24]. Considering the fact that inappropriate use of nonprescription drugs is associated with increased risk of drug interactions and toxicity and may lead to serious consequences, especially in children, elderly, and pregnant and lactating women [16], planning to reduce self-medication seems necessary.

The arbitrary use of antibiotics has also been reported high. Several studies in developing countries including Nigeria [20], Iraq [25], and the United Arabic Emirates [26], as well as studies in Iran including research on self-medication in referrers to pharmacies in Tabriz [24] and in students of medical sciences in Tehran [10] indicated indiscriminate and inappropriate use of antibiotics. Unfortunately, antibiotics are the most important irrationally consumed drugs and their arbitrary use can result in microbial resistance [26].

In this study, 82.2% of the participants reported self-medication with herbal drugs and distillates and 61.8% reported the groceries as their supply source. It can be inferred that the study groups were not aware of the possible effects of medicinal plants or they consider them free of side effects. In contrast, the study by Pourreza *et al*., showed that herbal medicines had almost the lowest use among medications [3.3%] in Tehran [10]. Differences can be explained regarding the climate and greater tendency of Kerman people to herbal remedies.

In the present study, the most important sources of information were included physicians, books, printed sources, and individual's knowledge and experiences respectively. Selection of these sources can be due to easier access to physicians and print resources about diseases and drugs in the workplace. In the study of Islami *et al*., physicians and printed resources reported as most prevalent sources of information which is consistent with our study [30].

Unfortunately, some patients request medicines based on their own diagnosis when visiting physicians. Amani *et al*. demonstrated that 31.7% of patients in Ardabil requested medicines when visited physician and the physician complied with 78.5% of the requests [11]. Furthermore, although provision of drug information by pharmacists may help reduce self-medication [27], only 48% of the subjects in this study obtained drug information from pharmacists and medicine sale staff. The findings demonstrated no significant relationship between self-medication and supplemental insurance, although in the study of Seyam et al, it was considered as a reason for self-medication in general population [17]. It seems that determinant factors such as easy access to drugs and relying on own scientific information and experience to visit a physician is more important than lacking supplemental insurance. Since this study was cross-sectional, it did not provide any causal claims on the direction of relationship. Therefore, a longitudinal study should be planned to determine a causal relationship. In addition, it was not possible to study physicians for their limited number. Another limitation of the study is the small number of individuals who have no self-medication comparing with who had in assessing variables. It needs to conduct further research with larger sample size.

CONCLUSION

The findings of this study revealed a high prevalence of self-medication among health staff. This may arise from trusting their personal knowledge about the diseases and medications, as well as indiscriminate use of medicinal plants for the self-care culture of Kerman people for herbal remedies. Therefore, in order to limit self-medication, it is proposed to utilize the results in national programs to lower self-medication and hold training workshops about self-medication side effects for employees. The Food and Drug Deputy could also exert greater oversight on pharmacies' performance to control the sale of unprescribed drugs and strict regulation of OTC sale. More research is also required to determine the causes of self-medication in this group and to amend related practice.

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