



## Original Research

# Awareness of Thamar University Medical Students Regarding Herbal Medicine Misuse and the Duties of Medical Sectors Towards this Problem

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## Abstract

**Background:** Herbal medicine has become more popular in Yemen in recent years.

**Aim:** This study assessed the current awareness of Thamar University medical students about the safety of herbal medicine and the malpractices and risks of herbal medicine in Yemen.

**Methods:** The study employed a cross-sectional study design involving sampling among medical students in Thamar University Faculty of Medicine and Health Sciences, Dhamar city from different levels (n=149), (Jun 2019). The pre-tested self-administered questionnaire containing structured questions were appropriately filled and returned for statistical analysis to assess awareness of factors and risks of herbal medicine malpractice. For data analysis, Statistical Package for Social Sciences (SPSS) was used.

**Results:** Out of 149 students surveyed, 139 students (93.3 %) think that the practitioners of herbal medicine in Yemen are not graduates of colleges or medical institutes and do not have any scientific qualification rate, and 103 (69.1%) students think that practitioners of herbal medicine are unable to diagnose diseases and describe the treatment as do the doctors of modern medicine. Also, (44.3 %) of them think that the factors leading people to herbal medicine are because of the impact of television programs and media advertisements for these practitioners. Also the weakening of health and medical care in the field of modern medicine, especially clinics, at a rate of 25.5%. It was found that the prevalence of herbal medicine in Yemen is due to ignorance at a rate of (50.3 %), then lack of governmental supervision (14.8 %), and poverty (8.1 %).

**Conclusion:** This study revealed that awareness of health professionals regarding the safety of herbal medicine is satisfactory.

**Keywords:** Herbal, Risks, Duties of medical student, Yemen.

## 1. Introduction

There are a lot of people who claim that they are

herbalists and treat people accordingly when they are not qualified enough to prescribe herbals for treating people. What is worse is that most of them do not even have certified degrees, and so, they are fake herbalists who

implement unsafe practice. However, unlike conventional drugs, herbal products carry out health risks, adverse effects and are not regulated for purity and potency [1]. Herbal drugs are considered as food integrators and readily available in the market without prescriptions. Due to the lack of peoples' knowledge and awareness about the potential risks and adverse effects of herbal medicines, the consumption of herbal medicines is increasing steadily as an alternative treatment for alleviating a number of different health problems. So the true risks of adopting herbal preparations as a treatment option therefore remain unclear. Herbal medicines contain pharmacologically active ingredients, some of which have been associated with adverse effects [2]. Kidneys are particularly susceptible to injury induced by toxins, including poisonous constituents from medicinal plants. The most recognized herb-induced kidney injury is aristolochic acid nephropathy connected with misuse of certain Traditional Chinese herbal medicines. Data concerning nephrotoxicity of plant species of European origin are scarce [3]. It is worth mentioning that adulteration of herbal products with dichromate, cadmium, and phenylbutazone also causes significant renal injury [4].

In Yemen, the sale of herbal medicine is profitable, and their use is advertised and strongly advocated in popular media, and is not balanced by package warnings or awareness campaigns about the risks and side effects. In addition, the lack of regulation and monitoring of traditional herbal preparations in means that their contribution to illness and death is unknown. Furthermore, it was reported that the adverse reactions caused by Chinese herbal medicine and traditional Chinese medicine have increased in recent years, among which the acute liver injury caused by Chinese herbal medicine accounts for 21.5% of total liver injuries [5]. Moreover, Aconitum Carmichael Debx.-derived herbal medicine has been used for anti-inflammation and anti-arrhythmia purpose for more than two thousand years. It is processed into Chuanwu (Radix Aconiti praeparata) and Fuzi (Radix Aconiti lateralis praeparata) in traditional Chinese medicine, which are two useful drugs but with toxic properties. There have been patients poisoned by accidental ingestion of Aconitum plants or misuse of herbal drugs [6].

In order to protect and improve our health, it is important to become an informed medical consumer. Herbal drugs are used widely for preventive and therapeutic purposes. The manufacturers of these products are not required to submit proof of safety and efficacy before marketing, so the adverse effects associated with remedies are largely unknown. Also, herbal products are not regulated for purity and potency. Thus, some of adverse effects reported could be caused by impurities or batch to batch variability. The potency of herbal products may increase the possibility of adverse effects [7].

Herbal supplements can be beneficial to consumers,

but they also may cause serious side effects and potentially dangerous conditions. Many plants are highly toxic. Herbal medicine probably presents a greater risk of adverse effects and interactions than any other complementary therapy. There are case report of serious adverse events after administration of herbal products. Some herbal products are problematic in terms of their ingredients, effects and interactions with prescription medications [8]. Complications associated with "non-medically qualified practitioners, lack of product standards, undeclared ingredients, nondisclosure of usage and long-term medication" have been identified [9].

In most cases, the herbs involved were self-prescribed and bought over the counter or obtained from a source other than a registered practitioner. This study assesses students' awareness of, and duties towards the misuse of herbal medicines and their duties towards it. Also, it will explain the duties of medical sectors in eliminating this problem from Yemen looking forwards to raising the awareness of these problems with health care practitioners and with the general public.

## 2. Methods

### Study Design

The study employed a cross-sectional study design involving multistage sampling among medical students (n=149) studying in the Faculty of Medicine, Thamar University, from February to July 2019.

### Study Group

The study included 149 medical students (4th, 5th, and 6th academic year) whom we recruited to assess awareness about herbal medicine.

### Data collection

To collect data from study participants, the pre-tested self-administered questionnaire was employed. The questionnaire was designed and validated based on an extensive review, placing attention on easy comprehension of the questionnaire. The modification was made as necessary to the final version of the questionnaire. The questionnaire encompasses three sections; the first part was used to assess the socio-demographic characteristics, while the second part was used to assess the practice and monitoring of herbal medicine. The last part of the questionnaire was used for the evaluation of the level of awareness of the Medical students on the safety of herbal medicine.

### Data analysis

The collected data was analyzed by Statistical Package for Social Science (SPSS) software (version, 20.0). Non continuous variable presented as frequency and percentage.

### Ethics statement

The study was reviewed and approved by the Thamar University medical Ethics Committee (TUMEC-19017). All the collected information was strictly kept confidential. No names were recorded in the questionnaire or samples

and only numbers were used instead.

### 3. Results

According to this cross-sectional study, the overall prevalence of herbal medicine was approximately (38.9 %) of the medical students attended TUATH, and the ignorance, lack of systemic control and poverty are determinant factors of prevalence of herbal medicine in Yemen. The study included two age groups. Out of the 149 students, 79 (53 %) were age group (22-25 years) and 70 (47 %) were of the age group (26-30 years). Out of the 149 students, 99 (66.3 %) were males and 50 (33.7 %) were females (Table 1).

**Table 1: General characteristics of the study group**

Item	n	%
<b>Gender</b>		
Male	99	66.3
Female	50	33.7
<b>Age</b>		
22-25 years	79	53
26-30 years	70	47
<b>Level</b>		
4th	7	4.7
5th	19	12.8
6th	123	82.6

The most common factors are the advertisement of the herbal products through TV programs and newspapers (44.3 %) and lacking of health and medical care in the field of modern medicine (25.5 %). Also it's found that people have the tendency to herbal medicine due to a group of reasons which include ignorance and low educational level (14.8 %). the scarcity of medical specialties, the impact of television programs and poor health care (7.7 %) and finally the herbal effectiveness (4 %).

Table 2. shows that among students on whom this study was conducted, about 28.9% of the reported that herbs substitute medicine for treatment which have advantages and disadvantages, while 28.2% have no knowledge about herbal medicine. Also, the other group of students 42.9% has different opinions about herbal medicine as that herbal medicine is a traditional medicine based on charlatanism and legends and practiced without qualifications and control which may harm people and deceive them for money. Overall the results indicate that lacking knowledge is a main factor in the high prevalence of such medicine.

Table 3 indicates that 69.1% of herbal medicine practitioners are unable to diagnose the disease and give the treatment because they did not pass the educational and practical stages as well as doctors of the modern medicine. In contrast, it is reported that about (27.5 %) of practitioners of herbal medicine may sometimes be able to diagnose disease and prescribe treatment while, (3.4%) indicate that herbal medicine practitioners are able to diagnose disease and prescribe treatment. According to this study, it is confirmed that about (87.6%)

of the students ' answers " who replied as NO and Sometimes " were that the herbal medicine has no positive effect on the health of patients, and this is due to lack of the health control imposed on herbal medicine and the expiration date. Furthermore, there are some of the herbalists have converted herbal medicine to a profitable trade for the purpose of material profit only which is reflected negatively on the health of the patient. However, about (13.4 %) of students who replied as Yes, reported that if the medicinal herbs do not benefit, they do not harm. Also they pointed to the availability of herbs, their abundance and their low cost. Regarding getting herbal treatment for family, (84.6 %) of the medical students answered no and sometimes, and (15.4 %) answered yes (Table . 3).

**Table 2: Causes and spread of the herbal medicine**

Item	Frequency	%
Ignorance	75	50.3
No control	22	14.8
Poverty	7	4.7
Believes	9	6.0
Failed medical diagnosis	3	2.0
Ignorance and no control	12	8.1
Ignorance and poverty	13	8.7
Ignorance and believes	1	0.7
Ignorance and failed medical diagnosis	1	0.7
Ignorance and publications	1	0.7
No control and poverty	1	0.7
No control and publications	1	0.7
Believes and publications	1	0.7
Ignorance, Poverty and failed medical diagnosis	1	0.7
Ignorance, failed medical diagnosis and publications	1	0.7
<b>Total</b>	<b>149</b>	<b>100.0</b>
<b>Why the people are turning to herbal medicine?</b>		
Rarity of qualified medical specializations in hospitals	7	4.7
Incapability of health welfare in modern medicine especially in dispensaries	38	25.5
TV programs	66	44.3
Efficacy of herbs	6	4.0
Others	22	14.8
Rarity of qualified medical specializations in hospitals	1	0.7
Incapability of health welfare in modern medicine especially in dispensaries, TV Programs	5	3.4
TV programs, efficacy of herbs	1	0.7
TV programs, others	2	1.3
Rarity of qualified medical specializations in hospitals, incapability of health welfare in modern medicine especially in dispensaries, TV Programs, others	1	0.7
<b>Total</b>	<b>149</b>	<b>100.0</b>
<b>Knowledge about herbal medicine</b>		
Traditional medicine is practiced without qualifications and control and harmful for people	41	27.5
Substitute medicine by herbs for treatment and have advantages and disadvantage	43	28.9
Charlatanism and legends is practiced by deceitful for money acquisition	23	15.4
Do not know	42	28.2
<b>Total</b>	<b>149</b>	<b>100.0</b>

In this research, lacking of knowledge and ignorance were major factors for the high prevalence of herbal medicine in Yemen. So the survey included a group of

methods and tools which aim at decreasing and solving such problem where education was the cornerstone for controlling of herbal medicine and decreasing its risks.

The results stated that the best method of education and spreading of awareness is by people with high degree of education as university and above in (55.7%), secondary school graduates (24.2 %) and about (20.2%) was for primary school and others. Moreover, the study has discussed a group of tools that help in the education and awareness of people about herbs. The most important tools chosen were radio and TV (44.3 %). Social media (17.4 %) and visiting the field (14.1 %) as these are the most available and almost present in all homes which make it more easy for people to be educated while they are at home. Other results were of multiple choice( Table 4).

**Table 3: Are herbal drugs able to diagnose and treat diseases?**

Item	Yes		Sometimes		No	
	NO	%	NO	%	NO	%
Is there positive effect for herbal medicine in the health of patients?	20	13.4	53	36.6	76	51
Do herbal practitioners are able to diagnose and treat diseases?	5	3.4	41	27.5	103	69.1
Do you get herbal treatment for you or member of your family?	23	15.4	35	23.5	91	61.1

**Table 4: Awareness and tools educated from malpractices herbalist**

Item	frequency	%
Specific age category for health education in this situation		
Primary	19	12.8
Secondary	36	24.2
University or above	83	55.7
Primary and secondary	1	0.7
Secondary, university and above	6	4
Primary, Secondary, university and above	4	2.7
<b>Total</b>	<b>149</b>	<b>100.0</b>
What is the right tools to be chosen to help educate in this aspect?		
Visit the field	21	14.1
Newspaper	3	2.0
Radio and TV	66	44.3
Social media	26	17.4
Visit the field and newspaper	1	0.7
Visit the field, radio and TV	4	2.7
Visit the field and social media	1	0.7
Radio, TV and social media	9	6
Visit the field, newspaper, radio and TV	1	0.7
Visit the field, radio, TV and social media	3	2.0
Newspaper, Radio and TV and Social media	2	1.3
Visit the field, Newspaper, Radio and TV and Social media	12	8.1
<b>Total</b>	<b>149</b>	<b>100.0</b>

Table 5. shows that education is a responsibility that should be taken in consideration especially in aspect of the governmental ministries. Statics showed that the ministry of information has play the major role (98.7 %)

in educating and instructing students about the herbal medicine and the risks of its malpractice. Also other ministries as the ministry of higher education (94.6 %), the ministry of education (92.6 %) and the ministry of planning (81.2 %) have an important shared role in controlling herbs, making solutions and increasing the awareness among people about herbs and herbal medicine practitioners. The results showed that only (6.7 %) of those who practice herbal medicine in Yemen are medical college graduates which means a high percentage of herbs practitioners have no certificate in medical field or even in other field (93.3 %). Here, the study showed that the medical students also have a big role (79.9 %) in educating and explaining people about such medicine.

**Table 5: Role of the ministries**

Item	Yes		No	
	NO	%	NO	%
The role of mosque	119	79.9	30	20.1
Is the ministry of education obligated to instruct students in schools?	138	92.6	11	7.4
Is the ministry of higher education obligated to instruct students?	141	94.6	8	5.4
Is the ministry of information obligated to instruct students?	147	98.7	2	1.3
Is there role for the ministry of planning?	121	81.2	28	18.8
Do you think those that who practice herbal medicine in Yemen graduate of medical college?	10	6.7	139	93.3

The study showed that the medical students has a major and important role (77.9 %) in teaching people, increasing their awareness and knowledge about herbs and the risks of using herbal medicine without knowledge. The role of medical students is not only done by education but also can be done by advising and guidance in about (17.4 %) but the survey also showed that (4.7 %) of medical students has no role in this aspect. In table (6), (47%) of the medical students refused the idea of herbal practitioners, (30%) answered sometimes, (15%) disagree, and (7.4%) agree (Table 5).

**Table 6: Role of medical students in malpractices herbalists**

Item	Frequency		%					
Item	Frequency		%					
	Agree	Sometimes	Disagree	Refuse the idea				
NO	%	NO	%	NO	%	NO	%	
What is the role of medical students in this aspect								
Advice and guidance	26	17.4						
Education and awareness of the people	116	77.9						
No role	7	4.7						
<b>Total</b>	<b>149</b>	<b>100.0</b>						
As a medical student, what do you think of herbal practitioners	11	7.4	45	30.2	23	15.4	70	47

## 4. Discussion

This study was carried out to show the awareness of

herbal medicine among medical students. Studies on herbal medicine are very important to assess the prevalence of herbal medicine and some of the dangers and risks that may be associated with such as medicine. An estimated 70-80 % of the world's population use non-Western medicine in the form of herbal preparations for their primary health care [10]. Many increases have been reported in many Western countries; in the United States, spending on herbal preparations doubled between 1997 and 2007 [11]. Despite these trends, there have been few recent investigations of the specific problems associated with the use of herbal medicines, and assessments of their safety rely on older studies. About 30 % of American patients use herbal medicines, often without the knowledge of their treating doctor [12-13]. In Australia and many other countries, more than half of those using complementary medicine [including herbal products] did not inform their doctors, and they often used such products together with conventional medications [14-15].

There is a number of reasons for this behaviour, including the belief that herbal preparations are natural products that can be freely combined with pharmaceutical drugs, the desire for a personal therapeutic regime, and a fear of disapproval or ridicule by health professionals [16]. Access to traditional medicines does not require a prescription, and they are prominently advertised in the popular media.

The side effects of herbal medicines used in traditional societies-such as Yemen- have not been reported and cited in favour of their safety, but the lack of systematic observation has meant that even serious adverse reactions, such kidney failure and liver damage caused by some plant species, were unrecognized until recently [17-18]. Further, this argument overlooks the potential for serious interactions of herbal preparations with prescription medications, the higher mortality rates in traditional societies, and the effects of globalization on the content and quality of herbal medicines.

Many people in Yemen turn to use herbal medicine due to the presence of a number of factors. This study showed that the level of awareness was satisfactory and the probability of this result was expected because the research was on the educated class. This is consistent with a study conducted in Malaysia [19], which reported that the results were the highest level of awareness based on the structured questionnaire. Inconsistency with another study conducted in Ethiopia [20], which had reported lower level of awareness of herbal medicine safety.

The majority of study participants did not agree that herbal practitioners are able to diagnose and treat illnesses. Furthermore, the majority of study participants agreed that health professionals have a crucial responsibility in monitoring of herbal medicine safety.

This finding strongly strengthens the recommendations already highlighted by the WHO that has indicated the importance of involving health professionals in monitoring of the safety of herbal medicine [21], which agree with recent reports that have evidenced the importance of enhancing the awareness of health

professionals about the use herbal medicines for making better informed decisions [22], and establish the effective herbal medicine policies and health education programs.

This indicates that strict legal procedures must be applied to those who practice this profession without knowledge or certification, and must be subjected to control by specialists. Moreover, people should be guided by the Ministry of Information through television and radio about the dangers of these wrong practices, and all relevant ministries such as ministry of education and ministry of higher education should make students aware of the dangers of these practices.

Practicing herbal medicine is still an important health problem in Yemen as it is mostly practiced without scientific knowledge and absence of systemic control and regulation. So targeted interventions are imminently needed, and these interventions should integrate different measures which control the use of herbal medicine and prevent the possible serious side effects and potential serious risks of herbal preparations.

## 5. Conclusion

Health education about herbal medicine and the risks of its use without knowledge should be carried out targeting all people of different levels. This forms the cornerstone in controlling herbal medicine, and it includes a group of aspects. Firstly, Holding seminars and conferences aimed at integrating the methods of herbal medicine with modern medicine in order to provide the possibility of benefiting from both types of medicine and to develop popular practices. Secondly, putting strict health control and systemic observation on herbal medicine in order to avoid any negative impact on the health of the individual and society in their lives. Also, the doctors should subject people to specific tests related to the health and therapeutic aspects, through the preparation of training and development courses supervised by committee of modern medicine doctors, who then have to give a certificate or official leave to allow the doctor to practice his work freely.

Moreover, raising awareness among community members about the negative effects that herbal medicine may have is important and can be implemented through specific lectures received in conferences, seminars and broadcast through local TV programs. Further studies regarding the prevalence of herbal medicine in Yemen and the risks of practicing such medicine without knowledge and control are recommended.

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**Competing interests**

The authors declare that they have no competing interests.

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