Original Article

Prevalence, knowledge, and perception about the use of herbal medicines jazan - Saudi Arabia

Amani Osman Abdelmola[1], Ahmed Bahri[1], Ismail Abuallut[1], Basmah A. Refaei[2], Walaa K. Hakami[2], Alhanouf K. Abutaleb[2], Salwa M. Mahzari[2], Mariam A. Mashragi[2], Shahad A. Es'haq[2], Khadijah F. Aldarbi[2]

[1]Department of Family and Community Medicine, College of Medicine, [2]Medical Student, Jazan University, Saudi Arabia

Abstract

Aim: This study aimed to assess the prevalence, knowledge and perception of Jazan province residents about traditional herbal medication. **Materials and Methods:** A cross-sectional study was done on 440 Saudi residents using an electronically distributed questionnaire. The questionnaire included 39 items divided into 4 parts. Data collected were about demographic characters, knowledge and perception about HM, and HM usage among participants. **Results:** Most of the participants used HM for therapeutic purposes (80.9%) and (29.5%) believed that mixing herbs together led to more effective results. The participants agreed to a very high degree that inherited culture plays an important role in HM use, however (84.5%) of them never used herbs. The participants used herbs mostly for treatment of diabetes mellitus representing (37%) and hypertension (20.5%). Age, marital status, and the job of participants had a statistically significant effect on participants' views about HM. While, gender, educational level, income, place of residence and chronic diseases had no statistically significant effect. **Conclusion:** The highest percentage of the participants used HM for therapeutic purposes. Increasing awareness of Saudi population about instructions and restrictions when using HM is greatly needed.

Keywords: Herbal, Jazan, knowledge, medicine, perception, prevalence

Introduction

The use of HM has become increasingly popular worldwide and it is often associated with self-administration.[1] The use of herbs for healing purposes predates recorded history and forms the origin of much of modern medicine.[2] Many synthetic drugs originate from plant sources: a century ago, most of the effective drugs were plant-based.[3] Modern western herbalism highlights the effects of herbs on the individuals' own body systems.[4]

Address for Corresponding: Dr. Amani Osman Abdelmola, Assistant Professor, Department of Family and Community Medicine, College of Medicine, Jazan University, Saudi Arabia.
E-mail: nonaosman@hotmail.com

Received: 16-02-2021 **Revised:** 28-02-2021
Accepted: 12-03-2021 **Published:** 02-07-2021

Access this article online

Quick Response Code:

Website: www.jfmpc.com

DOI: 10.4103/jfmpc.jfmpc_2475_20

Some people have an increasing interest in self-care, directed in an intense growth in popularity of traditional healing modalities. They believe them to be of 'natural' rather than 'synthetic' origin.[5,6] Herbal medicines may cause nephropathy and liver injury in some users because of the toxic chemicals or heavy metals they contain, or react harmfully with other drugs, a study has found.[7] The lack of enough systematic observation has meant that even serious adverse reactions, like the liver injury and nephropathy caused by some plant species, have gone unrecognized till recently.[8]

In the Kingdom of Saudi Arabia (KSA), people tend to use traditional medicine for treatment of diseases such as hypertension,[9] type II DM,[10] infertility,[11] or reduction of

How to cite this article: Abdelmola AO, Bahri A, Abuallut I, Refaei BA, Hakami WK, Abutaleb AK, *et al*. Prevalence, knowledge, and perception about the use of herbal medicines jazan - Saudi Arabia. J Family Med Prim Care 2021;10:2386-93

fractures in osteoporotic patients.[12] In KSA more than 25 plants are used for treatment of various diseases by local people,[13] and that the herbal medicines are more commonly used by females.[14] And it was reported that traditional herbal medicine had a usage rate as high as 69.9% in KSA.[15]

A study conducted in Al-Khobah, Jazan, revealed that there are more than 25 plants used for the treatment of various diseases by Saudi residents.[13] Another study done in 2014 revealed that most of the participants who used it were female (84.9%).[14] A study done in Riyadh, Saudi Arabia in 2016 showed that 25.3%, 33.7% and 48.9% were using herbs during pregnancy, during labor, and after delivery, respectively.[16] A study done in Jazan in 2012 revealed that 81% of women use herbal treatments while 40.5% of consult physician, mostly by oral route.[17]

Recently, a study was done in 2019 in Riyadh, Saudi Arabi found that most of study participants had knowledge about CAM and practiced CAM, particularly older individuals, and more than half of the respondents discussed CAM with health professionals.[18] And in 2019 a systemic review revealed that the prevalence of herbal medicine use ranged between 10.3% -75.0%. Herbal medicine use in Saudi Arabia was related to spiritual beliefs and perceived effectiveness and hopelessness for the modern medicines, followed by chronic illnesses.[19]

This study aimed to measure the prevalence, knowledge and perception of traditional herbal medicine among Jazan Province residents and to assess the relation between their views and the variables of research including age, gender, marital status, educational level, job, income, place of residence and chronic diseases.

Materials and Methods

Study design and settings: A cross-sectional descriptive analytical study was done in the Jazan province.

Population and Sampling: The research community consisted of all residents of the Jazan province. The sample of the research community was selected in a random, multistage manner, with a total of 440 members from both genders.

Data Collection Tools: A pre-designed questionnaire was used that was derived from a previous study.[14] It formed of 39 questions divided into four parts: the first part included 9 questions about the demographic data, the second part included 5 questions about the extent of the participants' knowledge about herbal medicine, the third part included 8 questions about the perception of the participants about herbal medicine and the last part included 17 questions about herbal medicine, the fourth part of the prevalence and usage among the participants. This questionnaire was distributed electronically.

Statistical Methods: Data was coded, entered, and analyzed using IBM SPSS statistics version 21.0.0.0 for Windows (SPSS Inc., Chicago, IL, USA). Qualitative data was presented as frequencies and percentages. Where quantitative data were presented as mean and standard deviations (mean ± SD) and the independent samples T-test and One Way ANOVA tests were applied to assess the relationship between variables. To discover the perception of the participants about herbal medicine, we used the five-dimensional Likert Scale cells. Determination of categories depended on the researcher's opinion, the objective of the research and the size of data used. The criterion (0.80) was used by adding its value to the lowest value in the scale (or the beginning of the scale is the correct one). The weighted arithmetic means, and the relative weight was assessed to judge the perception of the participants about herbal medicine when discussing the results of the tables and their explanation. A P value of < 0.05 was considered as statistically significant [Table 1].

Ethical Considerations: Written approval was obtained from the Jazan University Research Committee, KSA, with reference number : REC 40/3-081. Participation was voluntary, and a written consent was obtained from every participant. The confidentiality of all participants was maintained as no names were mentioned in the questionnaires. Data collected from the participants was only used for scientific purposes. There was a right for all participants to stay or withdraw at any time of study.

Results

This study included 440 participants and all of them agreed to participate in this study. The largest number of the participants (191, 43.4%) had the age range of 18-25 years, and the percentages of male and female members were equal representing 50% for each (220 for each gender) and all of them were Saudi. Most of the participants have a university education and above (329, 74.8%), while only 6 (1.4%) of them were uneducated. Only 78 (17.7%) of the participants have monthly income more than 20,000 SAR, while the rest of them (362) have monthly income less than 20,000 SAR. Most of the participants (329, 74.8%) in this study reported that they have no chronic diseases. [Table 2].

Knowledge of the Jazan population about herbal medicine

Table 3 shows that the highest percentage of the participants use herbal medicine for therapeutic purposes (356, 80.9%) and 130 (29.5%) of them believe that mixing herbs together led to more effective results. About 291 (66.1%) of the participants believe that there are instructions and restrictions to be taken into account when using herbs. Moreover, 218 (49.5%) of them believe that there are side effects to using herbal medicine, while 102 (23.2%) believe that there are no side effects to using it.

The most common source for obtaining information about herbs by the participants was from friends and colleagues (240, 54.5%), followed by TV and scientific programs (71, 16.1%), while the least source was study and learning (16, 3.6%).

Table 1: The Weighted Arithmetic Means

Scale of means	Scale of agreement	Scale point	Judgment of agree
<1.80	Strongly disagree	1	Very low
1.80-<2.60	Disagree	2	low
2.60-<3.40	I don't know	3	medium
3.40-<4.20	I agree	4	high
4.20-5	Strongly agree	5	Very high

Table 2: Distribution of the Participants According to Preliminary Data

Variable	Description	Frequency (*n*)	Percentage
Age	18-25	191	43.4
	26-35	116	26.4
	36-45	133	30.2
Gender	Male	220	50
	female	220	50
Nationality	Saudi	440	100
	Non-Saudi	0	0
Marital status	Married	231	52.5
	Single	186	42.3
	Divorced	16	3.6
	Widowed	7	1.6
Educational level	Uneducated	6	1.4
	Primary	5	1.1
	Intermediate	19	4.3
	Secondary	81	18.4
	University and more	329	74.8
Job	Student	156	35.5
	Employee	178	40.5
	Unemployed	88	20.0
	Private business	18	4.1
Income	0-5000 SAR		
	5001-10000 SAR	119	27.0
	10001-15000 SAR	109	24.8
	15001-20000 SAR	91	20.7
	20000 SAR and more	78	17.7
Chronic diseases	I do not suffer from any Chronic diseases	329	74.8
	Diabetes	26	5.9
	Hypertension	21	4.8
	Obesity	28	6.4
	Anemia	22	5.0
	Other	14	3.2

The perception of the participants about herbal medicine

Table 4 shows that the weighted averages of participants' view of herbal medicine ranged from 2.27 to 4.22. The general arithmetic mean was (3.40) of five points in light of distribution of the lengths of categories according to the gradient used in the tool. This indicates that the participants agree to herbal remedies in (high degree).

It is clear from Table 4 that the views of participants on herbal medicine, which the weighted average indicates very highly that the inherited culture plays an important role in the use of herbs. The views of the participants on herbal medicine, whose weighted average indicates that they are high, are: herbs have value in treating diseases, herbs are less expensive than modern medicine, herbal medicine needs to consult your doctor, and herbs are more accessible than medical drugs. The views of the participants whose weighted average indicates that it is moderate, are: herbal medicine is safer than medical drugs, and herbal medicine makes people dispense them along with the use of medical drugs. The views of the participants whose weighted average indicates that it is low is that there is sufficient awareness of herbs.

The extent of herbal medicine prevalence and usage among the participants

Table 5 shows that 372 (84.5%) of the participants had never used herbs, and 304 (69.1%) of them use herbs only when needed, while 38 (8.6%) of them use herbs every day. The results also showed that 142 (32.3%) of the participants use of herbs according to specific doses, while 122 (27.7%) of them use of herbs without specific doses. More than half of the participants (241, 54.8%) use the leaves of herbs, and 267 (60.7%) of them use herbs in the form of a drink or food. A large percentage of the participants (289, 65.7%) reported that they feel better after using herbs, 16 (3.6%) reported that herbs worsen their situation, and 62 (14.1%) reported that they did not feel any change in their condition after using herbs. Half of the participants (220, 50%) get the herbs from herbal shops.

In case of developing side effects secondary to using herbs, 299 (68%) of the participants will go to the doctor, 62 (14%) of them will treat these side effects with another herb. The participants commonly use herbs for treating diabetes mellitus (163, 37%), followed by hypertension (90, 20.5%). Regarding doctor consultation after contracting a disease, 275 (62.5%) of the participants go to the doctor immediately after contracting the disease, while 158 (35.9%) use herbs for treatment of the disease. This may be due to people's confidence in modern medicine.

About 293 (66.6%) of the participants have someone who uses herbs for the purpose of medication in their family, while 102 (23.2%) of them have no one who use herbs in their families. This suggests that the use of herbs for treatment is widespread among family members. Some of the participants (123, 28%) used herbal medicine for their children, while 93 (21.1%) do not use herbal medicine for their children. The results showed that 309 (70.2%) of the participants advise others to use herbs, while 131 (29.8%) do not advise others to use herbs.

The relation between the views of participants about herbal medicine and the variables of research (age, gender, Marital status, educational level, job, income place of residence and chronic diseases)

To assess this relation, the following statistical hypothesis was tested: "There were no statistically significant differences

Table 3: The Extent of the Knowledge of the Participants about Herbal Medicine

Question	Answer	Frequency (*n*)	Percentage
What is the purpose of using herbal medicine?	Immunotherapy	39	8.9
	Therapeutic	356	80.9
	Cosmetic	10	2.3
	Other	35	8.0
Is mixing herbs together leads to a more effective result?	Yes	130	29.5
	No	139	31.6
	I don't know	171	38.9
Are there any instructions and restrictions to be taken into consideration when using herbs?	Yes	291	66.1
	No	61	13.9
	I don't know	88	20
Are there any side effects to using herbal medicine?	Yes	218	49.5
	No	102	23.2
	I don't know	120	27.3
What is the source of information you have about herbs?	Parents and relatives	47	10.7
	Friends and colleagues	240	54.5
	TV and scientific programs	71	16.1
	Doctors and herbalists	30	6.8
	Internet and social media	36	8.2
	Study and learning	16	3.6

Table 4: Means and Standard Deviations of the Perception of the Participants about Herbal Medicine

Item	Mean	Standard Deviation	Degree of agreement	Rank
Herbs have value in treating diseases	3.98	0.725	High	2
Herbs are less expensive than modern medicine	3.95	0.877	High	3
Herbs are faster accessible than medical drugs	3.50	0.992	High	5
The inherited culture plays an important role in the use of herbs	4.22	0.671	Very High	1
Herbal medicine makes people dispense with the use of medical drugs	2.82	1.150	Medium	7
Herbal medicine is safer than medical drugs	2.93	1.110	Medium	6
Herbal medicine needs to consult your doctor	3.60	1.090	High	4
There is sufficient awareness of herbs	2.27	1.070	Low	8
General Mean	3.40	0.45475	High	

at ($P < 0.05$) between the arithmetic means of sample responses about their views on medicinal herbs due to demographic variables", the results are as shown in Table 6. It shows that age, marital status, and job of participants had statistically significant effects on participants' views about herbal medicines at ($P < 0.05$). Participants aged 36-45 years, married participants and those who were employed and unemployed strongly believed in herbal medicines more than those of the other comparable groups. Table 6 also shows that gender, educational level, income, place of residence and chronic diseases had no statistically significant effects on participants' views on herbal medicines at ($P < 0.05$), this means that their view on medicinal herbs was the same.

Discussion

In this study, a high percentage of the participants who used herbal medicine for therapeutic purposes agree to that as revealed from a previous Saudi study.[14] This high percentage may be due to that people consider herbs as better alternatives to chemical drugs. The high usage to CAM is reported worldwide for treatment of chronic diseases. In a study done in Oman, about half of patients used CAM therapies for diabetes mellitus, and they had a strong faith in its effectiveness in treating patients.[20]

The same wide use of HM was greatly due to its effect was reported in previous studies.[21,22]

Our result showed that 171 (38.9%) of the participants did not know whether mixing the herbs together led to more effective results, which is similar to the finding of the study conducted by Al Akeel.[14] A previous study done in Riyadh city found that 49.5% of the participants reported that combining herbal remedies and conventional drugs may be unsafe.[23] It was found that herb-drug interactions (HDI) through additive/synergistic or antagonistic interactions between herbal components and drugs can affect clinical safety and efficacy.[24] For example, the blood glucose lowering effect of antidiabetic drugs has been shown to be increased by agrimony.[25] HM contains multiple bioactive components for which there is a lack of understanding of how these components interact with each other and with pharmaceutical medicines when taken in combination.[26]

Table 5: The Extent of Herbal Medicine Prevalence and Usage among the Participants

Question	Answer	Frequency	Percent
Have you ever (even once in your life) used herbs?	Yes	68	15.5
	No	372	84.5
When was the last time you used herbs?	Every day	68	15.5
	Two days ago, or less	66	15
	A week or less ago	48	10.9
	A month or less ago	78	17.7
	Six weeks ago, or less	180	40.9
What is the frequency of your use of herbs?	Daily	38	8.6
	Weekly	30	6.8
	Only when needed	304	69.1
	No answer	68	15.5
Does your use of herbs have specific doses?	Yes	142	32.3
	No	122	27.7
	Sometimes	108	24.5
	No answer	68	15.5
What kind of herbs do you use?	Leaves	241	54.8
	Seeds	167	38
	Roots	14	3.2
	Other	18	4.1
How do you use herbs?	In the form of a drink or eat	267	60.7
	External use	100	22.7
	Other	73	16.6
What is the reason for your use of herbs?	Enhance Health	135	30.7
	Treatment of diseases	190	43.2
	Cosmetic	38	8.6
	Enhance physical functions	68	15.5
	Other	9	2
What do you feel after using herbs?	Better	289	65.7
	Worse	16	3.6
	No change	62	14.1
	Other	73	16.6
Where do you take the herbs you use most often?	Parents and relatives	21	4.8
	Friends and colleagues	93	21.1
	Herbs shops	220	50
	Websites	7	1.6
	Herbalists	23	5.2
	Other places	76	17.3
What will you do if you have a side effect because of your use of a large dose of herbs during treatment or use?	Treated with another herb	62	14
	Go to the doctor	299	68
	Other	79	18
What are the most common cases where herbs are used?	Fractures	47	10.7
	Diabetes	163	37
	Hypertension	90	20.5
	High temperature	28	6.4
	Malaria and infectious diseases	74	16.8
	Headaches	12	2.7
	Constipation	15	3.4
	Other	11	2.5
When herbs are often used by a person?	before a health exposure	31	7
	During a health exposure	296	67.3
	After a health exposure	113	25.7
Do you go to the doctor once you have the disease or depend on the herbs first?	Go to the doctor	275	62.5
	Use herbs	158	35.9
	Other	7	1.6
Is there anyone who uses herbs for the purpose of medication in your family?	Yes	293	66.6
	No	102	23.2

Contd...

Table 5: Contd...

Question	Answer	Frequency	Percent
Is there anyone who uses herbs for the purpose of medication from your friends or colleagues?	Yes	214	48.6
	No	52	11.8
	I don't know	174	39.5
Do you use herbal medicine for your children?	I do not have a child	224	50.9
	I have children and I do not use it	93	21.1
	I used it once	123	28
Do you advise others to use herbs?	Yes	309	70.2
	No	131	29.8

Table 6: Influence of Demographic Variables of Participants on their Views about Herbal Medicine

Variable	Groups	Mean±SD	Test	*P*
Age	18-25	3.11±0.34	44.1*	0.014
	26-35	3.21±0.27		
	36-45	4.13±0.29		
Gender	Male	3.24±0.23	1.28**	0.638
	female	3.21±0.26		
Marital status	Married	4.01±0.36	30.01*	0.01
	Single	2.87±0.12		
	Divorced	3.12±0.23		
	Widowed	3.16±0.21		
Educational level	Uneducated	3.0±10.2	3.5*	0.867
	Primary	3.09±0.21		
	Intermediate	3.02±0.13		
	Secondary	3.08±0.15		
	University and more	3.04±0.02		
Job	Student	3.11±0.3	16.92*	0.001
	Employee	4.11±0.31		
	Unemployed	3.35±0.12		
	Private business	3.16±0.25		
Income	0-5000 SAR		0.88*	0.455
	5001-10000 SAR	2.99±0.11		
	10001-15000 SAR	2.96±0.01		
	15001-20000 SAR	2.98±0.16		
	20000 SAR and more	2.97±0.24		
Chronic diseases	I do not suffer from any Chronic diseases	3.11±0.13	1.8*	0.883
	Diabetes	3.19±0.11		
	Hypertension	3.16±0.18		
	Obesity	3.15±0.2		
	Anemia	3.12±0.17		
	Other	3.13±0.16		

N. B.: *ANOVA test. **Independent sample t-test

In this study, we found that 291 (66.1%) of the participants believe that there are instructions and restrictions to be considered when using herbs, and 218 (49.5%) believe that there are side effects to using herbal medicine. In addition, this study participants agreed to herbal remedies to a high degree. This result is consistent with the finding of Abdel-Kader.[13] A recent Saudi study done in 2020 has found that 87% of community members didn't have confidence in everything that is published on social media about complementary and alternative medicine CAM.[27] A matter that was reported in a previous study done by Alduraywish, *et al.*,[28] where most of participants had no trust in the health information represented by social media.

Different results were revealed from a previous Saudi study, where 81.2% believed that herbal medicines and herbal dietary supplements are harmless.[23] In a previous study done in Oman, 47% of studied women believed that herbal medicine has no side effects.[29]

In this study, 240 (54.5%) of the participants get their information about herbs from friends and colleagues. Similar results were observed in a Saudi study.[16] The same result was also observed in recent Saudi study, where friends were the major source of complementary or traditional medicine information.[27] This is also in agreement with the results of a previous study done by the National Center for Complementary and Integrative Health (NCCIH), where family and friends were the main source of information.[30]

Our result showed that the most agreed item by the participants about herbal medicine is "The inherited culture plays an important role in the use of herbs". The high prevalence of CAM use in KSA compared to other countries was attributed to traditions and cultural factors as KSA has a known century old rich tradition and the culture of HM had strong faith and belief in spiritual healing.[31,32] And the least they have agreed on, is "There is sufficient awareness of herbs". This may be due to poor awareness, because of lack of the means that can be used to raise awareness. This lack of awareness of HM among the Saudi population was reported in a previous study done in Riyadh city.[33]

In our study, 241 (54.8%)) of the participants use leaves of herbs which is similar to the finding of the study conducted on traditional plants used in Al-Khobah village [13]. This possibly may be due to availability of leafy herbs in the Jazan province.[34]

The present work showed that 163 (37%) of the participants use herbs to treat diabetes. A previous study done in Riyadh in 2017 found that about 64% of diabetic patients used herbs for controlling diabetes.[35] And a systemic review done in 2018 found that the prevalence of use of CAM among Saudi diabetics 32.18%.[36] This result agrees also with finding of the study conducted in North Sudan about herbal medicine use among patients with Type 2 Diabetes.[10]

A large percentage (269, 67.3%) of the participants use herbs during a health exposure which is similar to the finding the study

conducted about the use of herbal medicines in the treatment of obesity in Taif, Saudi Arabia.[37]

About 214 (48.6%) of the participants have some of their friends or colleagues who use herbs for medication, which is similar to the finding of the study conducted by Al-Ghamdi *et al.*[16] about herbal medication use by Saudi women during pregnancy, labor and after delivery.

Our result showed that 309 (70.2%) of the participants do not advise others to use herbs. A recent study done in 2020 found that 40.7% of Saudi liver disease patients surveyed stated that they would advise other liver disease patients to use herbal treatment.[38]

This study showed participants aged 36 – 45 years, those who were married and employed, and unemployed participants compared to students and those having private business had a statistically significant higher believe in HM. This result is consistent with that observed in previous Saudi studies.[18] On the other hand, participants' gender, educational level, income, place of residence and having chronic diseases had no statistically significant effects on participants' views about herbal medicine. This result disagrees with that observed in previous studies, where women were more common users of HM compared to men.[39]

It was found that primary care physicians rarely initiate conversations with patients about the use of herbal medicine.[40] And patients also were found to be reluctant to reveal their usage due to the perception that the physician is not knowledgeable of these practices or will disapprove of alternative treatment.[41] Assessing patients use of herbal medicine and encouraging them to disclose their use is a very important task of the caring physician.[42] This could be done through the doctor-patient's strong interpersonal and communication skills.[42]

Limitations

The main limitation of the present study is having a cross-sectional design that can reveal the association between variables but not the casual relationships. In addition, the use of a predesigned questionnaire to collect data could have a recall bias.

Conclusion

The highest percentage of the participants in this study use herbal medicine for therapeutic purposes and agree to use it in a high degree. More than half of them feel better after using herbs. Age, marital status, and job of participants had statistically significant effects on their views on herbal medicines. On the other hand, gender, educational level, income, place of residence and chronic diseases had no statistically significant effects on the participants' views on herbal medicines. There is a need to increase the public awareness about instructions and restrictions when using HM. In addition, future studies are recommended to compare results of modern medicine with that of herbal medicine, and to assess the prevalence of herbal medicine usage in other Saudi Arabia regions.

Acknowledgements

The authors express their gratitude to all participants who shared in this study.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Welz AN, Emberger-Klein A, Menrad K. Why people use herbal medicine: Insights from a focus-group study in Germany. BMC Complement Altern Med 2018;18:92-101.
2. Rani V, Yadav UCS. Functional Food and Human Health. 1st ed. Singapore: Springer Nature; 2018.
3. Vickers A, Zollman C, Lee R. Herbal medicine. West J Med 2001;175:125-8.
4. Gupta N, Safhi MM, Nomier Y, Nayeem M, Husain SM, Tripathi P, *et al.* Chemo protective effect of leucas aspera plant in rats: DEN Induced hepatocarcino genesis. Int J Pharm Sci Rev Res 2015;30:22-7.
5. Portman TA, Garrett MT. Native American healing traditions. Int J Disabil Dev Ed 2006;53:453-69.
6. Samojlik I, Mijatović V, Gavarić N, Krstin S, Božin B. Consumers' attitude towards the use and safety of herbal medicines and herbal dietary supplements in Serbia. Int J Clin Pharm 2013;35:835-40.
7. Boon H. Stockley's herbal medicines interactions: A guide to the interactions of herbal medicines. Can J Hosp Pharm 2010;63:153.
8. Byard RW, Musgrave I, Maker G, Bunce M. What risks do herbal products pose to the Australian community?. Med J Aus 2017;206:86-90.
9. Hughes GD, Aboyade OM, Clark BL, Puoane TR. The prevalence of traditional herbal medicine use among hypertensives living in South African communities. BMC complement. Altern Med 2013;13:38-46.
10. Ali BAM, Mahfouz MS. Herbal medicine use among patients with type 2 diabetes in North Sudan. Annual Research & Review in Biology 2014;4:1827-38.
11. Kaadaaga HF, Ajeani J, Ononge S, Alele PE, Nakasujja N, Manabe YC, *et al.* Prevalence and factors associated with use of herbal medicine among women attending an infertility clinic in Uganda. BMC

Complement Altern Med 2014;14:27-33.

12. Wang YC, Chiang JH, Hsu HC, Tsai CH. Decreased fracture incidence with traditional chinese medicine therapy in patients with osteoporosis: A nationwide population-based cohort study. BMC Complement Altern Med 2019;19:42-51.
13. Abdel-Kader MS, Hazazi AM, Elmakki OA, Alqasoumi SI. A survey on raditional plants used in Al Khobah village. Saudi Pharm J 2018;26:817–21.
14. Al Akeel MM, Al Ghamdi WM, Al Habib S, Koshm M, Al Otaib F. Herbal Medicines: Saudi population knowledge, attitude, and practice at a glance. J Family Med Prim Care 2018;7:865–75.
15. Abuelgasim KA, Alsharhan Y, Alenzi T, Alhazzani A, Ali YZ, Jazieh AR. The use of complementary and alternative medicine by patients with cancer: A crosssectional survey in Saudi Arabia. BMC Complement Altern Med 2018;18:88-96.
16. Al-Ghamdi S, Aldossari K, Al-Zahrani J, Al-Shaalan F, Al-Sharif S, Al-Khurayji H, *et al.* Prevalence, knowledge and attitudes toward herbal medication use by Saudi women in the central region during pregnancy, during labor and after delivery. BMC Complement Altern Med 2017;17:1-9.
17. Zaghloul M, Salman A. Usages of herbal remedies for the management of vaginal infection among women in Jazan area at Saudi Arabia. CATRINA 2012;7:87-96.
18. Alarbash AA, Morait SA, Demyati EA. Knowledge, attitudes, and practices regarding complementary and alternative medicine among patients attending a family medicine clinic in Saudi Arabia: A cross-sectional study. J Med Sci Clin Res 2019;7:691-9.
19. Aldossary K. Use of herbal medicines in Saudi Arabia; A systematic review. Int Res J Pharm 2019;10:9-14.
20. Al-Kindi RM, Al-Mushrafi M, Al-Rabaani M, Al-Zakwani I. Complementary and alternative medicine use among adults with diabetes in Muscat Region, Oman. Sultan Qaboos Univ Med J 2011;11:62-8.
21. Al-Azzawia A M, Mehdi N, Al-Jubooric AG, Ejaz A, Ali H. Herbal medicines questionnaire and evaluation of attitude, perceptions and self-use among health care professionals in Rak, UAE: Pilot study. Int J Pharm Pharm Sci 2019;11:86-90
22. Lhamo N, Nebel S. Perceptions and attitudes of Bhutanese people on Sowa Rigpa, traditional Bhutanese medicine: A preliminary study from Thimphu. J Ethnobiol Ethnomed 2011;7:3-12.
23. Suleiman AK. Attitudes and beliefs of consumers of herbal medicines in Riyadh, Saudi Arabia. J Community Med Health Educ 2014;4:2-8.
24. Gupta RC, Chang D, Nammi S, Bensoussan A, Bilinski K, Roufogalis BD. Interactions between antidiabetic drugs and herbs: An overview of mechanisms of action and clinical implications. Diabetol Metab Syndr 2017;9:59-71.
25. Gray AM, Flatt PR. Actions of the traditional anti-diabetic plant, agrimony eupatoria (agrimony): Effects on hyperglycaemia, cellular glucose metabolism and insulin secretion. Br J Nutr 1998;80:109–14.
26. Hong SH, Heo JI, Kim JH, Kwon SO, Yeo KM, Bakowska-Barczak AM, *et al.* Antidiabetic and beta cell-protection activities of purple corn anthocyanins. Biomol Ther (Seoul) 2013;21:284–9.
27. El-Olemy AT, Aboushanab TS, Alqaed MS. Knowledge, attitude and practice of Saudi citizens towards complementary and traditional medicine. Health Edu Care 2020;5:1-5.
28. Alduraywish SA, Altamimi LA, Aldhuwayhi RA, AlZamil LR, Alzeghayer LY, Alsaleh FS, *et al.* Sources of health information and their impacts on medical knowledge perception among the Saudi Arabian population: Cross-Sectional Study. J Med Internet Res 2020;22:e14414.
29. Alsubaie SF, Alshehri M, Ghalib RH. Awareness, use, and attitude towards herbal medicines among Saudi women-cross sectional study. Imperial Journal of Interdisciplinary Research (IJIR) 2017;3:285-90.
30. Elolemy AT, AlBedah AM. Public knowledge, attitude and practice of complementary and alternative medicine in Riyadh region, Saudi Arabia. Oman Med J 2012;27:20-6.
31. Jaiswal K, Bajait C, Pimpalkhute S, Sontakke S, Dakhale G, Magdum A. Knowledge, attitude and practice of complementary and alternative medicine: A patient's perspective. Int J Med Public Health 2015;5:19-23.
32. Al-Yahia OA, Al-Bedah AM, Al-Dossari DS, Salem SO, Qureshi NA. Prevalence and public knowledge, attitude and practice of traditional medicine in Al- Aziziah, Riyadh, Saudi Arabia. Br J Med Med Res 2017;20:1-14.
33. Al-Arifi MN. Availability and needs of herbal medicinal information resources at community pharmacy, Riyadh region, Saudi Arabia. Saudi Pharm J 2013;21:351-60.
34. Tounekti T, Mahdhi M, Khemira H. Ethnobotanical study of indigenous medicinal plants of Jazan region, Saudi Arabia. Evi Based Complement Alternat Med 2019;2019:1-45.
35. Kamel FO, Magadmi RM, Hagras MM, Magadmi B, AlAhmad RA. Knowledge, attitude, and beliefs toward traditional herbal medicine use among diabetics in Jeddah Saudi Arabia. Complement Ther Clin Pract 2017;29:207-12.
36. Alsanad S, Aboushanab T, Khalil M, Alkhamees OA. A Descriptive review of the prevalence and usage of traditional and complementary medicine among Saudi diabetic patients. Scientifica 2018. doi: 10.1155/2018/6303190.
37. Eldalo AS, Alotaibi MN, Alenazi TO, Albogami HA, Mohamed KM. Use of herbal medicines in the treatment of obesity in Taif, Saudi Arabia. Saudi J Med Med Sci 2017;5:149–54.
38. Al-Zahim AA, Al-Malki NY, Al-Abdulkarim FM, Al-Sofayan SA, Abunab HA, Abdo AA. Use of alternative medicine by Saudi liver disease patients attending a tertiary care center: Prevalence and attitudes. Saudi J Gastroenterol 2013;19:75-80.
39. Aljaloud SO, Ibrahim SA. Use of dietary supplements among professional athletes in Saudi Arabia. J Nutr Metab 2013;245-349.
40. Jong MC, van de Vijver L, Busch M, Fritsma J, Seldenrijk R. Integration of complementary and alternative medicine in primary care: What do patients want? Patient Educ Couns 2012;89:417-22.
41. Farooqui M, Hassali MA, Abdul Shatar AK. Complementary and alternative medicines (CAM) disclosure to the health care providers: A qualitative insight from Malaysian cancer patients. Complementary Ther Clin Pract 2012;18:252–6.
42. Kelak JA, Cheah WL, Safii R. Patient's decision to disclose the use of traditional and complementary medicine to medical doctor: A descriptive phenomenology study. Evid Based Complement Alternat Med 2018;2018:4735234. doi: 10.1155/2018/4735234.