

Use of alternative medicine among hypertensive patients in Saudi Arabia

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ABSTRACT

Introduction: HTN is the most major modifiable risk factor for kidney and cardiovascular disease in terms of quantity, as well as the main risk factor for mortality. *Objective:* The purpose of this study was to determine how frequently alternative medicines were used by hypertensive patients in Saudi Arabia. *Methods:* Using an electronically distributed questionnaire, cross-sectional research of 774 Saudi citizens was conducted. The information gathered covered participant demographics, knowledge and perceptions of HM, and HM usage. *Results:* A total of 75.5% of participants used the herbal products. Rosella tea (14.3%) and peppermint tea (12.3%) were the two most frequently used. Additionally, 61.2% of participants used alternative medicine: Sports (27.75%) and cupping were the two most popular methods. The main two reasons for using complementary and alternative medicine were to protect their health (38.6) and to decrease their symptoms (33.1). Information was primarily obtained from friends and family (48.9%). The most common side effect of using complementary and alternative medicine was a headache (13%). *Conclusion:* Most participants had used herbal, complementary and alternative medicine (CAM) for HTN. CAM use in our population was not influenced by gender, marital status, level of education, nationality, region, or monthly income.

Keywords: Alternative medicine, hypertension, acupuncture, cupping, herbal medicine.

1. INTRODUCTION

HTN (HTN) is diagnosed when blood pressure continuously exceeds 130 and/or 80 mmHg (Flack & Adekola, 2020). Globally, the prevalence of HTN among people aged 30–79 years was 32% (Semplicini, 2021). In Saudi Arabia approximately 51.2% of people 55 and 64 years of age and up to 70% in those over 65 suffer from HTN (MOH, 2017). Modifying a person's lifestyle is the primary strategy for treating HTN (Chobanian et al., 2003). Medications are often required to control hypertension (Chobanian et al., 2003).

Globally, the use of herbal medicine (HM) is growing in popularity and frequently involves self-administration (Welz et al., 2018). HM predates

recorded history and is the genesis of a significant portion of contemporary medicine (Rani & Yadav, 2018). Many synthetic medications are derived from plant sources; a century ago, the majority of effective drugs were derived from plants (Vickers et al., 2001). Modern Western herbalism emphasizes the impact of plants on people's bodily systems (Gupta et al., 2015). Some individuals believe using HM is an effective treatment for HTN. Using plant parts such as roots, leaves, flowers, bark, berries and seeds for the treatment or prevention of illness is known as herbal medicine (Al Akeel et al., 2018). In fact, herbal products are used by 70% of people in developed countries (Chrysant & Chrysant, 2017). From 8–76% of Saudi Arabians have been reported to use HM (Aldossary, 2019).

Herbs are becoming a component of evidence-based medicine for the treatment of HTN (Chrysant & Chrysant, 2017). However, the issue with non-evidence-based medicine herbs is that they are not governed and overseen by the Food and Drug Administration (FDA). Most herbal products don't have acceptable quality assurance measures, proper labeling and might include heavy metal contamination (Chrysant & Chrysant, 2017). Previous study reported that adverse effects occurred in 6% of hypertensive patients receiving combination medication and herbs (Clement et al., 2007). Another study showed some types of herbs raised the danger of diuresis, hypotension and hypokalemia (Azizah et al., 2021). This study assessed the prevalence of alternative medicine use among Saudi hypertensive patients in the eastern province.

2. METHODOLOGY

Study design and selection criteria

An observational cross-sectional study was conducted to collect data by using a self-administered questionnaire. Selection criteria were males and females from different age groups who were diagnosed with HTN and willing to engage in the study. A participant's exclusion was based on their refusal to participate or incompleteness on the questionnaire.

Questionnaire design and validity

An extensive literature review was done to make our questionnaire. Then it was presented to three experts to get face validity. As Arabic is the native language of Saudi Arabia, the questionnaire was translated from English to the Arabic language by two bilinguals. Then the Arabic questionnaire was translated back to English by two cardiologists. The original English questionnaire and translated English questionnaire were similar. Thirty participants were involved in a pilot study. There were three sections in the questionnaire, beginning with the participants' consent. The second part consisted of five questions on the demographic characteristics of income, age, gender, marital status and education. The final part asked participants about complementary and alternative medicine (CAM) and products used, participants' seeking behavior in using CAM for HTN and adverse effects of CAM. The research questionnaire was designed in Google Forms and distributed at random using social media. Applications like WhatsApp, Telegram and Instagram were used to gather various groups and individuals. The three sections of the survey were developed and distributed from September 2022 to October 2022 and 774 responses were collected. Roughly 3 minutes was needed to finish the survey. King Faisal University's Ethics Committee gave its approval for this project. In accordance with the Helsinki declaration, the participant's confidentiality and privacy were assured before starting the survey. The completion of the questionnaire and its submission were regarded as agreement to use the respondents' responses in the study. (KFU-REC-2022-OCT-ETHICS259 is the ethical approval code.)

Statistical analysis

The IBM Statistical Package for the Social Sciences (SPSS) version 22 statistical software (SPSS, Inc., Chicago, IL) was used for all statistical analyses after the data had been extracted, evaluated and coded. The gathered data were shown using descriptive statistics, including frequency distribution, mean and standard deviation. Additionally, in order to determine if the categorical variables were associated, a chi-square test was utilized. 0.05 was used as the significance threshold (p value).

3. RESULTS

Of the 734 participants, 50.1% had HTN. Females made up 52.2% of the sample. Participants' ages ranged from 15–104 years, with a mean of 47.23 and standard deviation of 13.25. Regarding marital status, 48% were married; 11.9% were single, 4.1% were divorced, and 5.9% were widowed. As for the level of education, 51.7% had a university education, 24% had a secondary education, 12.4% had a primary education, 5.2% had an intermediate education and 6.7% had a postgraduate education. Regarding the living region, 40.8% were from the eastern region, 20.2% from the southern region, 18.6% from the north region, 9.8% from central region and 10.6% from the western region. About monthly income, 35.1% had an income of more than 10000SR, 23.3% an income less than

3000SR, 21.2% an income from 5000SR–10000SR and 20.4% an income from 3000SR–5000SR. About the occupational status, 44.2% were governmental employees, 15.8% were private employees, 5.4% were self-employed and 34.6% were unemployed (Table 1).

Table 1 Demographic data

Variables	Categories	N	%	
Gender	Male	370	47.8%	
	Female	404	52.2%	
Marital status	Single	92	11.9%	
	Married	604	78.0%	
	Divorced	32	4.1%	
	Widowed	46	5.9%	
Level of education	Primary	96	12.4%	
	Intermediate	40	5.2%	
	Secondary	186	24.0%	
	University	400	51.7%	
	Postgraduate	52	6.7%	
Nationality	Saudi	724	93.5%	
	Non-Saudi	50	6.5%	
Region	Western	82	10.6%	
	Eastern	316	40.8%	
	North	144	18.6%	
	Southern	156	20.2%	
	Central	76	9.8%	
Monthly income	Less than 3000SR	180	23.3%	
	From 3000SR–5000SR	158	20.4%	
	From 5000SR–10000SR	164	21.2%	
	More than 10000SR	272	35.1%	
Occupational status	Governmental employee	342	44.2%	
	Private employee	122	15.8%	
	Free business	42	5.4%	
	Unemployed	268	34.6%	
Age	Min	Max	Mean	Standard deviation
	15	104	47.23	13.25

Table 2 HTN (only hypertensive patients allowed to answer the questionnaire)

Variables	Categories	N	%
Duration of HTN in years	Less than 5 years	368	47.5%
	More than 5 years	406	52.5%
Do you suffer from any chronic diseases?	No	410	53.0%
	Yes	364	47.0%

Moreover, 50.1% of the participants were diagnosed with HTN and most of them had HTN for more than 5 years (52.5%). Additionally, 53% of them had no comorbidity (Table 2).

Complementary and alternative medicine (CAM)

Furthermore, the results showed that there were 75.5% using the herbal products. The most used product was rosella tea (14.3%), peppermint tea (12.3%), yogurt (11.6%), green tea (10.3%), lemon (9.7%), vitamins (8.8%), garlic (7.3%), dried lime (6.3%), saffron (5.4%), dietary supplements (5.2%), raisins (5.2%), flaxseeds (2.7%) and Chinese herbs (0.9%), (Tables 3 - 5).

Table 3 Herbal products using

Variables	Categories	N	%
Herbal products using	No	190	24.5%
	Yes	584	75.5%

Table 4 Herbal products used

No	Products	N	%
1	Garlic	188	7.3%
2	Flaxseeds	70	2.7%
3	Dried lime	160	6.3%
4	Yogurt	298	11.6%
5	Lemon	248	9.7%
6	Rosella tea	366	14.3%
7	Raisins	132	5.2%
8	Green tea	264	10.3%
9	Saffron	138	5.4%
10	Peppermint tea	316	12.3%
11	Chines herb	22	0.9%
12	Vitamins	226	8.8%
13	Dietary Supplements	132	5.2%

Table 5 Alternative medical

Variables	Categories	N	%
Alternative medical using	No	300	38.8%
	Yes	474	61.2%

Additionally, 61.2% were using alternative medicine, 60.7% using sports, 27.75% using cupping, 4.4% using acupuncture, 4% using manipulative body-based therapies, and 1.6% using hypnosis and reflexology (Table 6).

Table 6 Alternative medical methods

No	Methods	N	%
1	Cupping	178	27.7%
2	Manipulative body-based therapies	26	4.0%
3	Reflexology	10	1.6%
4	Acupuncture	28	4.4%
5	Sports	390	60.7%
6	Hypnosis	10	1.6%

Patient seeking behavior in using CAM for HTN

Table 7 Reasons for CAM using

	Reasons for CAM using	N	%
1	To support my standard treatment	86	18.2
2	Decrease my symptoms	156	33.1
3	Protect my health	182	38.6
4	Arabic tradition	46	9.7
5	Good price	2	0.4

Regarding the reasons for using CAM, the most stated reasons were to protect health (38.6), decrease symptoms (33.1), support standard treatment (18.2), Arabic tradition (9.7), and a good price (0.4), (Table 7).

Table 8 Source of recommendation

	Source of recommendation	N	%
1	Another hypertensive patient	64	15.2
2	Family/friends	218	48.9
3	My personal will	98	22
4	Herbalist	8	1.8
5	Nurse	10	2.2
6	Media and Internet	36	8.1
7	Pharmacist	8	1.8

Furthermore, the most common sources of information about CAM were family/friends (48.9%), then personal will (22%), another hypertensive patient (15.2%), media and internet (8.1%), nurses (2.2%), and then herbalists and pharmacists (1.8%), (Table 8).

Table 9 Monthly spending

	Monthly spending	N	%
1	Less than 500SR	354	79.7
2	From 500SR–1500SR	78	17.6
3	More than 1500SR	12	2.7

In addition, 79.7% were spending less than 500SR monthly on the CAM, 17.6% spending from 500SR to 1500SR, and 2.7% spending more than 1500SR (Table 9).

Table 10 Adverse effects of CAM among hypertensive

	Adverse effects	N	%
1	Diarrhea	42	7%
2	Sleep disturbance	64	10%
3	Flatulence	48	8%
4	Frequent urination	50	8%
5	Headache	80	13%
6	Abdominal pain	50	8%
7	Skin deformity	4	1%
8	Skin rash	4	1%
9	No symptoms	288	46%

Overall, 54% had an adverse effect from using complementary and alternative medicine. The most adverse effects were headache (13%), sleep disturbance (10%), flatulence, frequent urination, and abdominal pain (8%), diarrhea (7%), and then skin deformity and skin rash (1%) (Table 10).

Table 11 Association with the duration of HTN

		Duration of HTN in years			
		Less than 5 years		More than 5 years	
		N	N	Chi-square	p-value
Herbal products using	No	98	92	0.821	0.365
	Yes	270	314		

Alternative medical using	No	132	168	1.234	0.267
	Yes	236	238		

The results showed there was no significant association between the duration of HTN in years and using herbal products and between the duration of HTN in years and alternative medicine, where the p-value > 0.05 (Table 11).

Table 12 Association between demographic data and CAM using (herbal)

Variables	Categories	No	Yes	Chi-square	p-value
Gender	Male	104	266	2.426	0.119
	Female	86	318		
Marital status	Single	22	70	2.211	0.53
	Married	156	448		
	Divorced	6	26		
	Widowed	6	40		
Level of education	Primary	24	72	1.093	0.895
	Intermediate	6	34		
	Secondary	46	140		
	University	100	300		
	Postgraduate	14	38		
Nationality	Saudi	174	550	0.801	0.371
	Non-Saudi	16	34		
Region	Western	26	56	5.228	0.265
	Eastern	88	228		
	North	24	120		
	Southern	32	124		
	Central	20	56		
Monthly income	Less than 3000SR	56	124	4.902	0.179
	From 3000SR–5000SR	26	132		
	From 5000SR–10000SR	40	124		
	More than 10000SR	68	204		
Occupational status	Governmental employee	72	270	8.853	.031*
	Private employee	40	82		
	Free business	2	40		
	Unemployed	76	192		
Age	Test	Statistics	p-value		
	Independent Samples Test	-0.23	0.818		

The results showed a significant difference in CAM use (herbal) due to occupational status (chi-square = 8.853, p-value =0.031). On the country, there was no significant difference between gender, marital status, level of education, nationality, region, and monthly income, where the p-value > 0.05. Additionally, there was a significant difference in age due the CAM use (herbal), where the p-value > 0.05 (Table 12).

Table 13 Association between demographic data and CAM using (Alternative medical methods)

Variables	Categories	No	Yes	Chi-square	p-value
Gender	Male	124	246	4.11	.043*
	Female	176	228		
Marital status	Single	32	60	1.114	0.774
	Married	234	370		
	Divorced	12	20		
	Widowed	22	24		
Level of education	Primary	48	48	4.017	0.404
	Intermediate	16	24		
	Secondary	66	120		
	University	146	254		
	Postgraduate	24	28		
Nationality	Saudi	286	438	1.304	0.254
	Non-Saudi	14	36		
Region	Western	30	52	10.005	.040*
	Eastern	138	178		
	North	68	76		
	Southern	42	114		
	Central	22	54		
Monthly income	Less than 3000SR	90	90	9.911	.019*
	From 3000SR–5000SR	70	88		
	From 5000SR–10000SR	54	110		
	More than 10000SR	86	186		
Occupational status	Governmental employee	118	224	8.419	.038*
	Private employee	38	84		
	Free business	14	28		
	Unemployed	130	138		
Age	Test	Statistics	p-value		
	Independent Samples Test	0.901	0.368		

Moreover, there was a significant difference in the CAM using (herbal) due to gender (chi-square = 4.11, p-value = 0.043), region (chi-square = 8.853, p-value = 0.031), monthly income (chi-square = 10.005, p-value = 0.040), occupational status (chi-square = 8.419, p-value = 0.038). On the other hand, there was no significant difference in marital status, level of education and nationality, where p-value > 0.05. In addition, there was significant difference in age due the CAM use (alternative medical methods) where p-value > 0.05 (Table 13).

4. DISCUSSION

The present study found prevalent use of complementary and alternative medicines to treat HTN in Saudi Arabia; 75.5% of the participants used herbal products and 61.2% used alternative medicine. There has been an increase in using herbal products, as noted in a similar study in Ethiopia (Asfaw & Basazn, 2016). According to another study, 65.5% of participants (n = 262) used CAMs. Biological-based therapies were the most used type of CAM by 62.8% (n = 251) of patients (Ibrahim et al., 2017).

Regarding the association between demographic data and CAM use, the results showed that CAM use in our population is not influenced by gender, marital status, level of education, nationality, region and monthly income whereas governmental employee were more likely to use herbal products and alternative medical methods. Generally, we found conflicting results in studies regarding the association between demographic data and CAM use. This could be due to cultural variation and different values and belief of CAM users. Overall, studies reported that the use of CAM was independent of demographic data (Osamor & Owumi, 2010; Amira & Okubadejo, 2007; Hu et al., 2013). Furthermore, there was no significant association between the duration of HTN in years and herbal products use and between the duration of HTN in years and alternative medical use. This is inconsistent with

other studies in which patients with a duration of more than 5 years were more willing to use of CAM than patients with a duration less than that (Ibrahim et al., 2017).

Our research revealed that the majority of participants (75.5%) used herbal products. The most common herbal products were rosella tea (14.3%), peppermint tea (12.3%), and yogurt (11.6%). This finding is consistent with a number of international studies. A study in Ethiopia showed the most common biological preparations reported by hypertensive respondents were herbal-based medicine (67.5%) (Asfaw & Basazn, 2016). However, a lower percentage was found in Nigeria (63%) (Osamor & Owumi, 2010). An Iraqi study showed the herbal products appeared to be the most commonly used CAM among hypertensive patients, specifically garlic (31.0%) and flaxseeds (31.0%) (Hwang et al., 2016). In Palestine, 62.13% of hypertensive patients used herbal preparations, mostly garlic (33%) and 24.4% of them used honey (Ali-Shtayeh et al., 2013). In the Qassim region of Saudi Arabia, spiritual therapies (26.59%) were the most common CAM used among hypertensive patients followed by herbal products (15.95%). In general, between 8% and 76% of Saudi Arabians have been reported to use H (Farooqui et al., 2022). In Asir region, honey and olive oil were most frequently used (78.7%), followed by herbs (47.8%) (Dalia et al., 2021). In the western region, the most common substances used by the subjects were honey (82.8%) and herbs (75.5%) (El-Gamal et al., 2022). The CAM practices used in Saudi Arabia are related to spiritual beliefs and traditional factors. Other factors were easy accessibility, availability, and lower costs of the herbal products at different reigns in Saudi Arabia.

Moreover, alternative medicine use was the second-most common CAM by hypertensive patients (61.2%), which was characterized by cupping practice (27.7%). Similar findings have been reported in Iraq (27.8%) (Osamor & Owumi, 2010). In Asir region, 15.6% of participants used cupping as well as CAM (Dalia et al., 2021). Many studies reported that cupping was one of most common spiritual therapies in Saudi Arabia (Qureshi et al., 2018). It's due to Islamic prophetic medicine advocated by the Prophet Mohammad (PBUH). In fact, a randomized controlled trial demonstrated that wet-cupping therapy was successful in lowering systolic blood pressure in hypertensive patients for up to 4 weeks without any harmful side effects (Aleyeidi et al., 2015).

The most common reason for using CAM was to protect health (38.6%); other reasons were to decrease symptoms, to support standard treatment, Arabic tradition and a good price, (33.1%), (18.2), (9.7), (0.4), respectively. Contrary to other research, the most common reasons for using CAM were to support standard treatment (61.5%) (Ibrahim et al., 2017), relieve symptoms of disease (48.9%) (Ali-Shtayeh et al., 2013) and dissatisfaction with conventional medicine (27.6%) (Asfaw & Basazn, 2016). Other reported reasons were to slow down the progression of disease, cure disease and reduce side effects of medication (Ali-Shtayeh et al., 2013). Effectiveness of CAM, holistic care and cultural reasons, CAM has little or no side effects (Lulebo et al., 2017). The most common source of information was family/friends (48, 9%), which is consistent with the research in South Africa (68.2%), Palestine family member (49.8%), friend (38.9%) and Iraq (36.6%) (Hughes et al., 2013; Ali-Shtayeh et al., 2013; Ibrahim et al., 2017). In contrast to studies which showed notable percentages for herbalist (10.6% and 29%, respectively) (Ibrahim et al., 2017; Ali-Shtayeh et al., 2013) and pharmacist (21.8%) as a source of recommendation. Current studies showed that herbalist and pharmacist were the lowest percentage (1.8%) which is similar to a study in Jordan (Afifi et al., 2010). 54% of individuals in the current study had CAM-related adverse effects. This is in line with what is found in the northeast of England (45.8%) (Bello et al., 2012).

The majority of participants mostly turned to their relatives and friends for information. Side effects of herbal use were noted by many of our participants, such as headaches, sleep disturbance, flatulence, frequent urination and abdominal pain. This is similar to a study in northeast England (Bello et al., 2012). Less common side effects were skin rash and skin deformity. This differs from an Iraq study in which skin rash was the common side effect (Ibrahim et al., 2017). In addition, they reported pulmonary embolism and syncope as serious side effects of using CAM in a few events (Bello et al., 2012). Other side effects were pneumothorax, cardiac tamponade, spinal injury and hepatitis in acupuncture user (Niggemann & Gruber, 2003). This study's limitation is that it uses cross-sectional design to indicate association between variables but not causal relationships. It is necessary to raise public understanding of the directions and limitations associated with the use of alternative and complementary medicine. Additionally, it is advised that future research compare the outcomes of conventional treatment with those of alternative and complementary treatment.

5. CONCLUSION

Herbal treatments are widely used in Saudi Arabia among hypertensive patients. Participants believed that herbal remedies may be used alongside conventional medications even without the advice of a physician or pharmacist. It is necessary to raise public understanding of the directions and limitations associated with the use of alternative and complementary medicine. It is important to be aware that herbal products are not risk free and that the danger of medication interactions is not presently well studied; thus,

further study in this area is essential, and health care practitioners should advise hypertensive patients to use caution where necessary.

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Author contributions

The authors Walaa Aladhab, Abdullah Bohamad, Sawsan Alhashem, Turki Alhumam and Aisha Bubshait were involved in writing manuscript content. Eman Elsheikh was responsible for manuscript review and editing. All the authors acknowledge and accept full responsibility for the work that was performed.

Ethical Approval

The study was approved by King Faisal University's Ethics Committee. Ethical approval code is KFU-REC-2022-OCT-ETHICS259.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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