

SYSTEMATIC ARTICLE

The Practice of Herbs Integration Among Patients With Hypertension Attending Primary Care Facilities: A Systematic Review

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ABSTRACT

Introduction: The practice of integrating herbs among patients with hypertension to manage their condition has become more evident across many countries. This systematic review was conducted primarily to determine the prevalence and diversity of herbs used by patients with hypertension attending primary care facilities. **Data Sources:** Studies were obtained from five electronic databases (September 2019) and references of included studies. **Review Methods:** Studies performed on patients with hypertension attending outpatient clinics and hospitals that reported prevalence or diversity of herbs were included. Two independent researchers performed screening, quality appraisal and data extraction. **Results:** Sixteen studies were included in this review. The prevalence of herbs used ranged from 6.5% to 69.0%. The two most common herbs reported were *Allium sativum* and *Vernonia amygdalina*. The main reasons patients' took herbs were to reduce blood pressure, to relieve symptoms of the disease and perception that allopathic medicine was a failure. Age, education level, presence of other family members with hypertension and gender were significantly associated ($p < 0.05$) with the use of herbs. **Conclusion:** Patients with hypertension who attend outpatient clinics tend to use herbs to complement their allopathic medicine. Further evaluation in the form of randomized controlled trials should be conducted to determine the effectiveness of herbs and herbal medicine in improving hypertension among patients.

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INTRODUCTION

Hypertension is an alarming public health condition. Worldwide, a total of 1.28 billion adults in the age category between 30-79 years old were reported to have hypertension (1). The prevalence was reported to increase over the years, with significant increase in the low- and middle-income countries (2). This is alarming as hypertension raises the risks of developing other chronic ailments such as cardiovascular and kidney disease (3). Population ageing, unhealthy diet and sedentary lifestyle has been reported to reasons for the increase in hypertension (2).

Evidence-based treatment for hypertension is vital in reducing cardiovascular related mortality and morbidity. The antihypertensive medication with lifestyle modifications was reported to be effective

in treating hypertension (4). However, evidence which show growing use of herbs for hypertension treatment by patients alongside the standard medication is becoming more evident. A previous systematic review by Liwa et al. reported that the prevalence of traditional herbal medicine used by patients with hypertension ranged from 25-65% with an average of 38.6% (5). A recent systematic review by Nur Azizah et al. also found that 262 out of 7302 hypertension patients used herbal medicines and antihypertensive drugs simultaneously (6).

The use of herbs such as *Crocus sativus* L. and *Nigella sativa* L. in controlling high blood pressure has increased over the years (7, 8). Findings from studies conducted on these herbs suggest that despite their ability to reduce blood pressure, its effectiveness in treating hypertension remains to be proven (7, 8). Thus, this warrants a need for a systematic evaluation of the use of herbs by patients with hypertension on a broader scale which includes patients from various cultures and background.

BACKGROUND AND AIMS

Herbs are a type of complementary and alternative medicine (CAM) categorized as biological based therapies. Studies reported that one of the most common reasons patients take herbs are due to their deep rooted believes in the effectiveness of plants and as part of their tradition and culture (9). Ibrahim et al reported that Iraqi patients took herbs as a complement to conventional medicine due to Arabic tradition and culture (10). In Malaysia, the local community often consumes ulam, traditional Malay vegetables for various health conditions including hypertension (11). However, the use of herbs on its own or concurrently with allopathic medicine may cause side effects or adverse effects to the patients (12).

Previously, a few systematic reviews on use of herbs by hypertension were conducted. Liwa et al. conducted a systematic review on the usage of herbs to treat hypertension among patients. However, this review was only limited to studies performed in Sub-Saharan Africa (5). Other recent reviews by de Fatima Mantovani et al., and Grant et al., focused on complementary and alternative medicine (CAM) with little emphasis placed on herbs (13, 14). However, these reviews pointed out that phytotherapy and biological based therapies which may also refer to herbs were the most common types of CAM used (13, 14). A systematic review that summarizes and evaluates the use of raw herbs is lacking specifically among primary care patients. By understanding the patients' patterns of herb use and the reasons for using them, healthcare professionals will be able to act appropriately in the management of patients with hypertension to avoid unnecessary complication from the disease. Hence, this systematic review was conducted with the aimed to provide an overview of the prevalence and diversity of herbs integrated by patients with hypertension who attended healthcare facilities. It also aimed to present the reasons why patients take herbs, associated factors of herbs use and possible adverse effects of taking herb. This knowledge would be a good stepping stone towards the integration of CAM such as herbs into conventional care in order for healthcare systems to adopt a more holistic approach in providing treatment options for chronic diseases like hypertension.

DESIGN

Protocol and Registration

This was a systematic review reporting the prevalence of herbs used in patients with hypertension using a descriptive approach. This review was conducted based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement (15). The review protocol of this review was registered at PROSPERO (ID: CRD42020142139).

SEARCH METHODS

This review included observational studies that reported the prevalence of herbs used among patients with hypertension attending hospitals or clinics. Studies that focused solely on ethnobotany were excluded because it did not survey on patients who were attending hospitals or clinics. For this review, "herbs" was defined as herbal medicine, finished herbal products, herbal materials, herbal preparations of crude herbs in its raw form or minimally processed. The study can either report an overall prevalence or individual prevalence of herbs used.

Articles other than observational studies or conducted on specific population groups such as pregnant women or healthcare workers were excluded. Letters to the editor, meta-analyses, systematic reviews, conference proceedings, and non-English were excluded.

SEARCH OUTCOME AND AUDIT TRAIL

The literature review was undertaken in the following databases over the stated time frames: five databases which included PubMed, Scopus, CINAHL, PSBC and Web of Science and the latest search was conducted on the 18th of September 2019. We used three concepts which were patients, herbs and hypertension to develop keywords and subject headings based on each database for the search. The search strategies were shown in Supplementary Table I. No limitations on the publication year were used for the search. Reference mining and expert recommendation was used to obtain additional articles. E-mails were sent to relevant authors who had experience in the field of herbal medicine to ask for recommendation on the types of articles which may be included for this systematic review.

The references extracted from the databases into ENDNOTE were screened in terms of title and abstract by two researchers (RJ and AL). If there was disagreement about inclusion, the third researcher (CH) reviewed the article and resolved the discrepancy. Subsequently, the same process was employed in the full text assessment to decide whether the articles can be included in this review.

QUALITY APPRAISAL

The selected studies were assessed using the AXIS tool for cross-sectional studies. This tool, consisting of 20 fields was designed to highlights issues present in cross-sectional studies and to assist in the quality assessment of the selected study (16). The AXIS tool functions to cumulatively assess

individual characteristics of a study and does not use a numerical scale to create a score for quality assessment (17). The AXIS tool was pilot tested by RJ and AL to ensure a standard method of assessing the articles was agreed on. Articles would be qualitatively graded according to their quality (good, satisfactory, poor) as described in Supplementary Table II. The assessment was performed independently by two different reviewers (RJ and AL) and discrepancies were solved by consensus with CH. The purpose of the quality assessment was only to present the quality of the studies but not as a threshold to select the studies for inclusion in the review as meta-analysis was not planned to be done. As for the impact on the overall conclusion, the other articles with good and satisfactory qualities also showed similar trends of herb use among hypertension patients who were attending healthcare facilities.

DATA ABSTRACTION

Data extraction was performed using a self-designed data extraction sheet using Microsoft Excel. Two independent reviewers performed data extraction and any discrepancies were solved by consensus. The data extracted included study characteristics and participant details such as author, year, country, setting, study design, primary mode of data collection, sampling technique, response rate, number of participants, mean age, female gender frequency and mean duration of disease. The prevalence of herbs used and diversity of herbs, which were the primary outcomes of this review were extracted into the data extraction form. Secondary outcomes for this review were the reasons why patients took herbs and associated factors of herbs use. Furthermore, the main source of recommendation for herbs use, side effects, disclosure of herbs usage with health-care staff and preparation method of herbs were also extracted

SYNTHESIS

Data was presented using descriptive statistics and measure of central tendency. Prevalence of herbs used was compiled and presented at 95% confidence levels. Meta-analysis was not performed due to the high heterogeneity of the included studies.

RESULTS

Study Characteristics

A total of 5810 articles were extracted from the five databases and nine additional articles were identified from reference mining and expert recommendation (Figure 1). Duplicates were then removed yielding a remainder of 4019 articles. After title and abstract screening, there were 64 articles left where the full texts were subsequently assessed for eligibility. Finally, 16 studies met the inclusion criteria and were selected for qualitative synthesis and

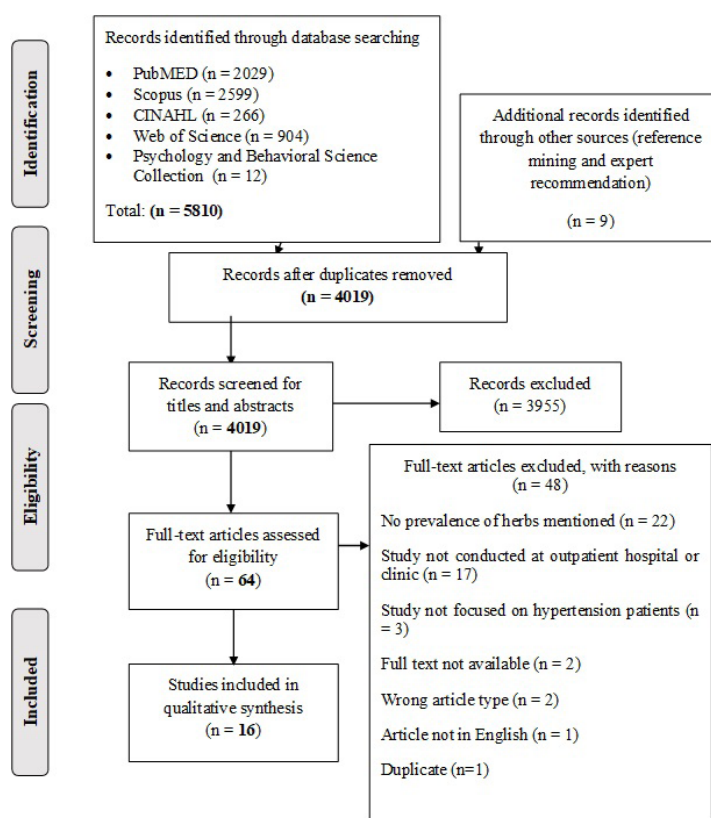


Figure 1 : Flow chart indicating identification, screening and evaluating of articles for this systematic review. The prisma flow diagram indicates the process of selection for relevant articles with data related to the review's objectives. The bolded figures show the number of articles in each stage of the selection process.

quality evaluation as shown. After quality assessment, most of the included studies had satisfactory (n=5) or good (n=8) quality while three studies had poor quality. All 16 studies were included despite some having poor quality as it contains relevant information which is in line with the objectives for this review.

Study characteristics and references were shown in Table I. Most were conducted in Asia (n=8) and Africa (n=5) while there were only three studies conducted in Europe. The number of participants for each study ranged from 72 to 4575 accumulating to a total of 10 029 patients. The mean age of the participants ranged from 55.1 ± 2.4 to 62.9 ± 9.8 as reported by ten studies. Among the 15 studies that reported gender frequency, 13 were predominantly female with a frequency ranging from 40.3% to 72.0% with an average of 60.48%. The mean duration of hypertension experienced by participants had a range 7.6 to 10.8 years as reported across 7 studies. A total of ten studies used face-to-face interviews as their primary mode of data collection. About 4 studies used random sampling to recruit participants.

Table I : Basic study characteristics and study methodology of included studies

Author, year	Country	Setting	Study Design	Primary Mode of Data Collection	Sampling Technique	Number of subjects	Mean age	Female Gender Frequency (%)	Mean disease duration
Akansel et al., 2017	Turkey	University hospital	Descriptive	Self-administered survey	Non-random sampling	127	59.3 ± 11.97	67.7	10.37 ± 9.17
Ali-shtayeh et al., 2013	Palestine	Government hospitals, military and refugee clinics	Cross-sectional	Face-to-face interviews	Non-random sampling	4575	NR	56.5	NR
Amira and Okubadejo, 2007	Nigeria	University hospital	Descriptive	Face-to-face interviews	Non-random sampling	225	55.1 ± 12.4	60.0	10.8 ± 8.5
Bahar et al., 2013	Turkey	Primary care centers	Descriptive	Face-to-face interviews	Non-random sampling	193	61.04 ± 11.89	72.0	8.28 ± 7.92
Gohar et al., 2008	United Kingdom	University hospital	Cross-sectional	Self-administered survey	Non-random sampling	153	57.3 ± 16	46.3	10.1 ± 10.2
Hu et al., 2013	China	Outpatient clinics	Cross-sectional	Self-administered survey	Non-random sampling	318	62.9 ± 9.8	71.7	8.2 ± 7.1
James et al., 2018	Sierra Leone	University hospitals	Cross-sectional	Face-to-face interviews	Non-random sampling	260	NR	63.5	NR
Kretchy, Owusu-Daaku and Danquah, 2014	Ghana	Government clinic	Cross-sectional	Self-administered survey	Random sampling	400	NR	62.5	NR
Mahfudz and Chan, 2005	Malaysia	Government hospital	Cross-sectional	Self-administered survey	Random sampling	124	NR	40.3	8.4
Olisa and Oyelola, 2009	Nigeria	Rural hospital	Cross-sectional	Face-to-face interviews	Random sampling	480	60.33 ± 16.33	NR	NR
Peltzer, 2004	South Africa	Seven district hospitals	Cross-sectional	Face-to-face interviews	Non-random sampling	100	60.7	67.0	NR
Peltzer and Pengpid, 2019	Thailand	Government clinic	Cross-sectional	Face-to-face interviews	Non-random sampling	1396	NR	60.8	NR
Ching et al., 2013	Malaysia	Subspecialty clinic	Cross-sectional	Self-administered survey	Random sampling	294	56.3 ± 10	61.6	NR
Tajadini et al., 2015	Iran	Outpatient clinic	Cross-sectional	Face-to-face interviews	Non-random sampling	612	61.0 ± 10	59.6	NR

Toprak and Demir, 2007	Iran	University hospital	Cross-sectional	Face-to-face interviews	Non-random sampling	72	56.5 ± 8.4	58.3	7.6 ± 6
Wazaify et al., 2013	Jordan	Community healthcare centers	Cross-sectional	Face-to-face interviews	Non-random sampling	700	NR	59.1	NR

Table II : Prevalence and Main Types of Herbs used in selected studies

Author, Year	Overall Prevalence/definition of herbs	Main Types of Herbs	
		Name of Herbs	Frequency among herbs users (%)
Akansel et al., 2017	NR	Herbal medicine	18.2
		Lemon juice	83
		Garlic	35
		Herbal tea	8
Ali-shtayeh et al., 2013	62.1% used herbs	<i>Allium sativum</i> , garlic	33.1
		<i>Hibiscus sabdariffa</i> , roselle	17.6
		<i>Olea europaea</i> , olives	16.7
		<i>Crataegus aronia</i> . hawthorn	12.9
		<i>Anisum vulgarea</i> , anise	9.4
Amira and Okubadejo, 2007	37.8% used herbs and dietary supplements	<i>Allium sativum</i> , garlic	69.3
		Native herbs	25
		Ginger	23.9
		<i>Vernonia amygdolina</i> , bitter leaf	9.1
		Aloe vera	4.5
Bahar et al., 2013	51.3% used herbs	Lemon juice	33.6
		Lemon and garlic mixture	25.2
		Garlic	15.0
		Mixture of lemon and parsley/lavender flowers/ sour pomegranate /airan/ soda/olive tree leaves	14.0
		Thyme	3.7
Gohar et al., 2008	6.5% used herbal medicine	NR	NR
Hu et al., 2013	18.5% used herbal medicine	NR	NR
James et al., 2018	56.9% used herbal medicine	Honey	33.3
		<i>Moringa oleifera</i>	30
		Garlic	27.3
		Bitter leaf	3.7
		Lemon grass	1.1

Kretchy, Owusu-Daaku and Danquah, 2014	12.8% used biological based therapies (herbs)	Herbal mixtures	17.65
		Bitter leaves + dandelion + moringa	13.73
		Garlic + dandelion	11.76
		Garlic	9.8
		Dandelion + moringa	9.8
Mahfudz and Chan, 2005	15.3% used herbal medicine	<i>Morinda citrifolia</i> , mengkudu	NR
		<i>Centella asiatica</i> , pegaga	
		<i>Andrographis paniculata</i> , hempedu bumi	
		<i>Carica papaya</i> , papaya	
		<i>Boswellia serrata</i> , arthrid	
Olisa and Oyelola, 2009	25% used herbal medicine	<i>Azadirachta indica</i>	12.5
		<i>Allium sativa</i>	9.62
		<i>Aloe vera</i>	7.69
		<i>Tamrindus indica</i>	7.69
		<i>Hyenia thebacia</i>	7.69
Peltzer, 2004	26% used herbs	NR	
Peltzer and Pengpid, 2019	32% used herbal medicine	<i>Carthamus tinctorius</i>	NR
Ching et al., 2013	NR	Bitter gourd	34.4
		Garlic	17
		Misai kucing	14.6
		Ular hempedu	8.5
		Basil leaf	1.7
Tajadini, 2015	29.4% used herbal medicine	Green tea	49.1
		<i>Althaea officinalis</i>	35.6
		<i>Carthamus tinctorius</i>	12.5
Toprak and Demir, 2007	NR	Yogurt with garlic	27.8
		Sour food	25
		Garden thyme juice	2.8
Wazaify, 2013	69% used herbs	<i>Hibiscus sabdariffa</i> , roselle	NR
		<i>Zingiber officinale</i> , ginger	
		<i>Olea europaea</i>	
		<i>Crataegus aronia</i>	
		<i>Cinnamomum zeylanicum</i>	

*NR: Not reported

Table III : Reasons and Associated Factors for using Herbs

Secondary Outcomes	Findings	Main Author, Year
Reasons for using herbs	- relieve symptoms of disease (48.9%)	Ali-Shtayeh , 2013
	- slow down progression of disease (37.6%)	
	- cure of disease (31.5%)	
	- reduce side effects of medication (13.1%)	
	- perception of allopathic medicine failure (31.73%)	Olisa, 2009
	- allopathic medicine’s high cost (23.08%)	
	- cultural practices/herbal knowledge (20.19%)	
	- poor accessibility to medical facilities (19.23%)	
	- safety concerns about allopathic medicines (9.62%)	
	- to decrease blood pressure (93.8%)	Tajadini, 2015
	- as adjuvant therapy (88.3%)	
	- for diabetes (21.6%)	
	Associated factors of herbs use	- age, above 50 years old (p=0.001)
- education level, less educated (p=0.000)		
- family history of hypertension (p=0.000)		
- education level, have higher education (p=0.01)		Mahfudz, 2005
- age, older respondents (p<0.05)		Olisa, 2009
- gender, female (p=0.005)		Tajadini, 2015

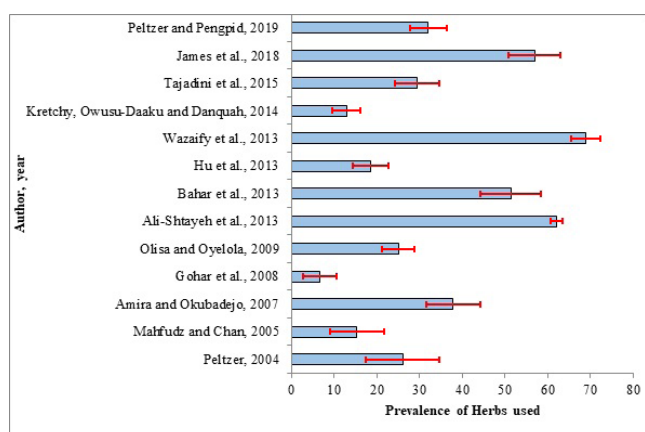


Figure 2 : Prevalence (% ± 95% confidence interval) of herbs used by hypertension patients. The prevalence of herbs used was arranged from the years 2004 up to 2019.

Primary Outcomes

Thirteen studies reported the overall prevalence of herbs used by hypertension patients in their studies and this ranged from 6.5% to 69.0% as indicated in Figure 2 (18, 20, 23-33). Three studies only reported the prevalence of individual herbs used as shown in Table II.

For the types of herbs, the five main herbs with the highest frequency of use reported from each study were presented in Table II. The most common herb reported was *Allium sativum*, commonly known as garlic which was reported in nine studies (19, 20, 22-26, 29, 30). The second most reported herb used by patients with hypertension was *Vernonia amygdalina* or bitter leaves which were mentioned in four studies (24, 25, 29, 30). Ginger, lemon, hawthorn, thyme, aloe vera and *Carthamus tinctorius*

were each reported in two studies. The preparation methods of herbs used reported across three studies were varied. In one study, herbs were mostly self-prepared using cooking (*Allium sativum* and *Hibiscus sabdariffa*) or taken raw (*Allium sativum* and *Olea europaea*) (26). In the second study, most of the herbs were taken as a drink or after adding water (sour pomegranate and lemon juice) and chewed or swallowed whole (garlic and flax seed) (23). The third study reported that most herbs were self-prepared (*Azadirachta indica* and *Allium sativa*) (25).

Secondary Outcomes

Reasons and Associated Factors for using Herbs

The reasons herbs and its associated factors among hypertension patients were extracted and detailed in Table II. Three studies also indicated the reasons why patients took herbs while four studies showed the associated factors for herb use. Some common reasons why patients took herbs were to reduce blood pressure, to relieve symptoms of the disease and perceived that allopathic medicine was a failure. Four studies reported the associated factors of herbs use. One study reported that age ($p=0.001$), education level ($p<0.001$) and presence of other family members with hypertension were significantly associated with herbs use (26). A second study also mentioned age ($p=0.05$) as an associated factor (25). Gender ($p=0.005$) also showed significant association with herbs use in one of the studies (20). Education level ($p<0.01$) was also a significant factor in another study (18).

Main Source of Recommendation, Side Effects and Disclosure of Herbs Use to Physician

Based on the four studies that reported sources of recommendation for herb use, the main sources for each study were family members (49.8%) (26), friends or neighbours (63.5%) (23), traditional medicine practitioner (70.4%) (29), and family members and friends (41.5%) (20). In terms of side effects, one study stated that 86.5% of herb users perceived that no side effects were noted when taking herbal medicine (29). In contrast, another study mentioned that 21.0% of participants co-administering allopathic medications and herbal medicines reported adverse effects such as diarrhoea, abdominal discomfort, palpitations, skin reactions, erectile dysfunction and gastroenteritis (25). Three studies which reported the disclosure of herbs use for hypertension indicated that were more than half of the patients did not discuss the use of herbs with their health care provider. The percentage of non-disclosure ranged from 68.1% to 85.1% with a mean of 74.8% (25, 26-29).

DISCUSSION

This systematic review is the first to focus on the prevalence and diversity of herbs integrated among patients with hypertension who are attending

outpatient hospitals or clinics. Previous systematic reviews conducted on prevalence of CAM use among various populations have often cited herbs as the most popular CAM modality (34, 35). Therefore, it is vital that herbs should be given more attention.

The prevalence of herbs used across the included studies showed a range of 6.5% to 69.0%. In a review by Grant and colleagues reported that 22% to 68% of cardiovascular disease patients used biological based therapies (14). The attributions for wide range in the prevalence were due to different definitions of herbs, varied culture and socio-economic background of patients across developed and developing countries, and diversity of herbs across temperate and tropical countries (26, 29). This may explain why there is wide range of herbs use reported by patients. Nonetheless, only limited studies revealed the prevalence of herbs type used among the patients. Studies have shown that, herbs use among patients is common in this new era of modern medicine. Hence, an-evidence based herbs education hub, namely websites, and mobile applications can help those who use herbs to know the herbs which they integrate with their prescribed medications.

Based on the included studies, it is clear that patients with hypertension chose to integrate herbs to manage hypertension although they attended outpatient clinics or hospitals. These patients are likely taking antihypertensive drugs in conjunction with herbs which put them at risk towards unwanted herb-drug interactions (36). Previous investigations have shown that grapefruit juice may increase calcium channel blockers in the blood which could aggravate hypertension, or cause liver toxicity (37). Despite this, patients perceived that taking antihypertensive drugs alone is not helping them with their chronic disease. Some patients have indicated that their use of herbs may be due to the side effects of medication and cultural practices (19, 26). This finding is common among Malay patients, in Malaysia as they prefer to use herbs because they viewed them as part of their culture and religious beliefs (19). Hence, evidence-based herbs use, such as, improving patient-doctor communication and increasing randomised controlled trial study on herbs effectiveness as to facilitate patients to use herbs safely.

In our study, a diverse type of herbs were used by patients while managing hypertension. In the previous studies, garlic supplements and *Vernonia amygdalina* were reported to significantly lowered blood pressure (39-41). Additionally, a systematic review reported that specific spices and herbs may have the potential to be used to aid the management of hypertension among patients (42). These studies highlight experimental

and cultural influences over herbs integration attitude in managing hypertension in different communities/countries. However, it must be stressed that only verified information regarding herbs should be consumed by patients to prevent misinformation. Hence, government with support from the social media, should take control on releasing only evidence-based herbs use in managing hypertension.

The preparation methods of herbs differed for included studies. However, herbs were mostly self-prepared through cooking, taken raw or as a drink (23, 25, 26). Different preparation methods such as boiling, frying or steaming may increase or decrease phytochemical contents of the herbs (43). In addition, studies did not report on the amount or the number of times patients took herbs for their high blood pressure. Although plants were commonly consumed due to their potent biological features, over consumption of phytochemicals such as flavonoids may potentially contribute to toxic effects. Flavonoids can alter hormone metabolism by inhibiting key enzymes and may be mutagens (44). With that in mind, one of the included studies mentioned that a portion of herb users showed adverse effects such as diarrhea, abdominal discomfort, palpitations, skin reactions, erectile dysfunction and gastroenteritis (25). Therefore, patients should be advised against substituting drugs with herbs or taking both concomitantly as their safety and efficacy has yet to be proven (45).

This review reported that patients take herbs as they feel herbs can control the progression of their disease and its symptoms. This could be due to patients' lack of knowledge to recognize evidence-based herbs, while self-managing their hypertension. In this study, patients expressed that they are facing high expenditure and low confident to use allopathy medicine to manage hypertension. Furthermore, a perception that the patients were overly concerned about their condition exists, reinforcing dependence in the herbs and inadvertently increasing risk of drug-herbs interaction. Worryingly, this review found that an average of 74.8% of patients who take herbs do not notify their physician about their use of herbs. Therefore, patients and their caregivers should be educated about the importance of being compliant with prescribed drugs and they should facilitate reports about their compliance so that hypertension can be managed.

This review had several limitations. Firstly, no average prevalence for herbs could be obtained because the definitions of herbs varied across the included studies. Besides, two full texts of articles were unable to be retrieved and several articles that may have been included were rejected as they were not in English. Hence, this may have led to important

data being excluded in this systematic review. Only studies which were performed in an outpatient clinic or hospital were selected for this review. Studies which included the types of herbs used by hypertension patients such as ethnobotanical studies may contain information on the types of herbs used. Thus, this review may not contain all the possible types of herbs which are used by patients for high blood pressure. Lastly, most studies did not utilize a validated questionnaire hence reducing the validity of the data obtained. Some studies also showed poor quality as they fail to report the method of obtaining sample size, discuss limitations of study and have inconsistent results. Therefore, findings from this review should be interpreted with caution.

CONCLUSION

In conclusion, this review found that the use of herbs as one of the main modalities of CAM among patients with hypertension was evident despite them attending primary care outpatient clinics for treatment purposes. It showed patients with hypertension tend use herbs or herbs-based products to complement their allopathic medicine. It has been identified that a vast diversity of herbs was reported across the 16 studies. Patients were keen to use herbs despite the lack of information about the practice of using herbs. The preliminary review on prevalence of herbs use among hypertension patients suggested that prevalence might increase on the use of herbs and may potentially decrease the actual uptake of evidence-based practice as well. However, certain herbs might complement allopathic medicine which could aid in the overall management of hypertension. Human and animal studies on certain herbs have shown promising results, however herb-drug interactions have also been reported. Hence, a careful balance must be struck between the use of herbs and allopathic medicine with the knowledge of physicians. Further evaluation in the form of randomized controlled trials should be conducted to determine the effectiveness of herbs and herbal medicine in improving the hypertension among patients. Apart from that, this study also allowed further refinement of review on evidence-based herbs use to reduce blood pressure to improve its practice among patients. Eventually, the goal of adopting an integrative approach towards the management of a chronic disease such as hypertension may be within reach.

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