EVALUATION ON THE USE OF COMPLEMENTARY AND ALTERNATIVE MEDICINE AMONG HYPERTENSIVE PATIENTS IN BAGHDAD, IRAQ: A MIXED METHODS APPROACH

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by

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DEDICATION

To whom without her I would never being able to continue the way… to my mother

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LIST OF ABBREVIATIONS

AMS	Alternative Medical System
BBT	Biological Based Therapies
CAM	Complementary and Alternative Medicines
CAMGHP	Complementary and Alternative Medicine Guide for Hypertensive Patient
HTN	Hypertension
HTN-RK	Hypertension-Related Knowledge
HBM	Health Belief Model
HRQoL	Health Related Quality of Life
IBD	Inflammatory Bowel Disease
JNC	Joint National Committee
MBBT	Manipulative Body-Based Therapies
MBT	Mind-Body Therapies
MOH	Ministry of Health
NCCIH	National Centre for Complementary and Integrative Health
QoL	Quality of life
SIP	Syndicate of Iraqi Pharmacists
TTM	Transtheoretical Model
TPB	Theory of Planned Behavior

GLOSSARY OF KEY TERMS

Alternative medical system	A system of theories and practices that sit outside the standard pharmacological treatment.
Attitudes	A learned predisposition to think, feel and act in a particular way towards a given objects or class of objects.
Biological-based therapies	The use of substances found in nature for healing purposes and promoting the health.
Complementary and alternative medicines	A group of diverse medical and healthcare systems, practices, and products that are not currently part of conventional medicines.
Health-related quality of life	a subjective outcome that reflects the person's perceptions of his or her health status
Hypertension	A condition in which blood pressure is elevated to an extent where benefit is obtained from blood pressure lowering.
Manipulative body-based therapies	A technique of manipulation or movement of parts of the body.
Mind-body based therapies	This technique based on the principle that the mind has the greatest effect on body's activities.
National Centre for Complementary and Integrative Health	The main body of US federal government responsible for the scientific researches on CAM.
Patient education	A planned and organized learning experiences aimed to assist controlled adoption of behaviors, skills, or beliefs advantageous to health
Self-care	The capability of people, families, and communities to take part in health promotion and protection, disease prevention, and dealing with illness and disability either with or without the support of a health care provider.
The Joint National Committee	A board for the prevention, detection, evaluation, and treatment of high blood pressure.

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PENILAIAN PENGGUNAAN PERUBATAN KOMPLIMENTARI DAN ALTERNATIF DALAM KALANGAN PESAKIT HIPERTENSI DI BAGHDAD, IRAQ: SATU PENDEKATAN KAEDAH GABUNGAN

ABSTRAK

Kepentingan yang semakin meningkat dengan perubatan komplementer dan alternatif (CAM) adalah jelas dalam kalangan pesakit dengan hipertensi (HTN). Kajian ini bertujuan untuk mengkaji penggunaan bagi terapy CAM oleh pesakit hipertensi; sikap terhadap CAM dan ke arah mendedahkannya kepada doktor sebelum dan selepas program pendidikan; kesan pengetahuan berkaitan dengan hipertensi (HTN-RK) dan kualiti hidup yang berkaitan dengan kesihatan (HRQoL) terhadap penggunaan CAM. Teknik metodologi bercampur diterima. Yang pertama adalah teknik kualitatif melalui temu bual dengan 20 pesakit yang menggunakan panduan wawancara separa berstruktur. Kaedah pensampelan purposif digunakan untuk pengambilan pesakit. Yang kedua ialah reka bentuk kuantitatif di mana kajian rentas kerangka telah dijalankan di dua hospital pengajaran utama di Baghdad. Kaedah pensampelan mudah digunakan untuk merekrut 400 pesakit dan soal selidik yang telah disahkan digunakan untuk pengumpulan data. Tambahan pula, program pendidikan tentang CAM telah dilaksanakan. Keputusan fasa kualitatif mengesan bahawa 14 pesakit menggunakan CAM untuk mengawal tekanan darah. Tiga tema utama dikenal pasti dengan CAM; faedah yang dirasakan; dan komunikasi dengan doktor. Amalan ini memberi sokongan kepada rawatan farmakologi dan disokong oleh kesan sosial, rawatan kos rendah; kesan keagamaan, dan perspektif budaya. Analisis kuantitatif menunjukkan bahawa 65.5% responden menggunakan CAM

dalam pengurusan HTN. Penggunaan ini dikaitkan dengan tahap pendidikan (P< 0.001); status perkahwinan (P= 0.007), dan tempoh HTN (P= 0.045). Sesetengah kesan buruk yang dilaporkan telah dilaporkan kerana amalan ini. Pengguna CAM dilihat mempunyai sikap yang lebih baik berbanding rakan sejawatannya (P< 0.001). Sikap ini dikaitkan dengan jantina (P< 0.001) dan tahap pendidikan (P< 0.001). Komunikasi dengan pesakit dengan doktor sangat miskin (11.5%), dan sikap yang kurang baik untuk mendedahkan CAM kepada profesional kesihatan telah diperhatikan. Peningkatan yang signifikan dalam sikap terhadap CAM (P< 0.001) dan sikap terhadap pendedahan kepada profesional kesihatan (P< 0.001) dikesan selepas campur tangan pendidikan. Status kesihatan yang paling dilaporkan pada ukuran EQ-5D adalah 12233. Pengguna CAM melaporkan status kesihatan yang lebih rendah daripada bukan pengguna (P< 0.001). Selain itu, tahap pengetahuan berkaitan dengan hipertensi HTN-RK tidak mencukupi di kalangan responden, dan ia adalah yang paling rendah di kalangan pengguna CAM (P< 0.001). Model ramalan mengesan tahap pendidikan (OR= 26.8, P< 0.001) dan HTN-RK (OR= 0.29, P< 0.001) adalah satu-satunya peramal menggunakan CAM oleh pesakit hipertensi. Kesimpulannya, CAM menjadi lazim di kalangan pesakit hipertensi di Iraq disebabkan sikap yang menggalakkan dan kurangnya mendedahkan amalan ini kepada doktor. Sesetengah ciri pesakit; dan juga, HTN-RK dikaitkan dengan penggunaan pesakit CAM. Pakar-pakar kesihatan mesti menyedari amalan ini dan memberi nasihat kepada pesakit mereka mengenai penggunaan CAM secara bersamaan dengan rawatan yang ditetapkan. Campur tangan pendidikan tentang CAM adalah penting untuk meningkatkan sikap pesakit terhadap CAM; serta mengelakkan risiko yang tidak perlu dikaitkan dengannya.

EVALUATION ON THE USE OF COMPLEMENTARY AND ALTERNATIVE MEDICINE AMONG HYPERTENSIVE PATIENTS IN BAGHDAD, IRAQ: A MIXED METHODS APPROACH

ABSTRACT

The growing interest with complementary and alternative medicine (CAM) is evident among patients with hypertension (HTN). This study aimed to investigate the use and seeking behavior of CAM by hypertensive patients; attitudes towards CAM and towards disclosing it to the doctors before and after an education program; the effect of hypertension-related knowledge (HTN-RK) and health-related quality of life (HRQoL) on patients' use of CAM. A mixed methodological technique was adopted. The first was a qualitative technique through interviews with 20 patients using semi-structured interview guide. A purposive sampling method was used for patient's recruitment. The second was a quantitative design where a cross-sectional study was conducted at two major teaching hospitals in Baghdad. A convenience sampling method was used to recruit 400 patients and a validated questionnaire was used for gathering of data. Further, an educative program about CAM was implemented. Results of the qualitative phase detected that 14 patients were using CAM to control the blood pressure. Three major themes were identified familiarity with CAM; perceived benefits; and communication with the physicians. This practice was supportive to the pharmacological treatment and underpinned by the social effect, low cost treatment; religious effects, and cultural perspectives. The quantitative analysis showed that 65.5% of respondents used CAM in the management of HTN. This use was significantly associated with the education level

(P< 0.001); marital status (P= 0.007), and the duration of HTN (P= 0.045). The most reported reason of using CAM was to support the standard treatment and this practice was recommended by other hypertensive patients. The mean annual expenditure on CAM was US $ 319. Some perceived adverse effects were reported due to this practice. CAM users were noticed to have a higher favorable attitude than their counterparts (P< 0.001). This attitude was associated with the gender (P< 0.001) and the education level (P<0.001). Patient's communication with the doctor was very poor (11.5), and poor attitude towards disclosing CAM to the health professionals was noted. Significant improvements in attitudes towards CAM (P< 0.001) and attitudes towards disclosing it to the health professionals (P< 0.001) were detected after the educative intervention. The most reported health status on EQ-5D measure was 12233. CAM-users reported a lower health status than non-users (P< 0.001). Furthermore, the level of hypertension-related knowledge (HTN-RK) was inadequate among the respondents, and it was the lowest among users of CAM (P< 0.001). A prediction model detected that the education level (OR=26.8, P< 0.001) and HTN-RK (OR=0.29, P< 0.001) were the only predictors of using CAM by hypertensive patients. In conclusion, CAM was prevalent among Iraqi hypertensive patients due to favorable attitudes towards it and lack of disclosing this practice to the doctors. Some of patient's characteristics; as well as, HTN-RK were associated with patient's use of CAM. Health professionals must be aware of this practice and counsel their patients regarding the concomitant use of CAM with the prescribed treatment. The educative intervention about CAM is important to improve patients' attitudes towards CAM; as well as, prevent the unnecessary risk associated with it.

CHAPTER 1 - INTRODUCTION TO THE STUDY

1.1 Background of the study

Complementary and alternative medicine (CAM) is a domain of treatment linked to some health practices and beliefs that fall outside the field of conventional medicine (Zollman and Vickers, 1999). For years, CAM represents a traditional treatment under the category of natural therapies in different parts of the world (WHO, 2013b). In modern era, CAM continues to attract patient's attention and plays an incomprehensible role in the treatment of different ailments. Recent studies have detected a growing interest with CAM in the management of hypertension (HTN) even in countries where the Western medicines are predominant (Hu et al., 2013b, Kretchy et al., 2014). Although the reasons of using CAM are not fully understood; some theories have been reported in the scientific literatures.

Notably, it was found that patients with chronic diseases are more likely to select CAM to cure from their illness (Astin, 1998, Thorne et al., 2002, Mollaoğlu and Aciyurt, 2013). This was due to either unfavorable health outcome or dissatisfaction with the provided health care (Astin, 1998, Saydah and Eberhardt, 2006). Evidence suggests that the failure of the conventional medicine to effectively treat many chronic diseases and their symptoms leads the patients to apply CAM (Boon et al., 2000, Bishop and Lewith, 2010). In addition, a consideration of poor health status may push the patient to choose CAM as a way of healing from illness or decreasing the associated pain (Bausell et al., 2001, Lee et al., 2004, Hlbocky et al., 2007).

The use of CAM has also been linked with specific attitudes towards this practice. Researchers have found that those who perceive CAM to be consistent with their

concepts of health and illness would theoretically be more likely to use it (O'Callaghan and Jordan, 2003, McFadden et al., 2010, Grzywacz et al., 2012). Patients may find CAM attractive because it is consonant with their values, religious, health philosophies, and beliefs regarding the nature and natural products (Furnham and Forey, 1994, Astin, 1998). Added to this, users of CAM perceive that a combination of it with the standard medicine would result in better treatment effect (Mollaoğlu and Aciyurt, 2013).

Dissatisfaction with patient-doctor communication was also proposed to influence patient's decision in seeking CAM. Usually, patients were found to be reluctant in consulting their doctors about this behavior due to expectations of doctor's rejection and poor interest with CAM (Ali-Shtayeh et al., 2013, Kretchy et al., 2014). The other determinants of CAM use include the demographic characteristics of the patient. Studies have detected a higher prevalence of CAM use among women, person with average age and higher educational status (Bausell et al., 2001, Yeh et al., 2006). Despite the growing interest with CAM among hypertensive patients in different parts of the world; a comprehensive understanding of the motives to pursue this practice in the control of blood pressure is poorly investigated.

It is striking to know that information about evaluated efficacy, safety or comprehensive policy of CAM is still limited. Moreover, preparation methods and the required doses of CAM are yet vague. A herb containing variety of substances (mostly unknown) may include some unwanted effects (Bielory, 2002). A treatment method using a mechanical procedure may lead to injuries; as well as, a healer without adequate education may be a cause of treatment failure (Niggemann and Grüber, 2003). For chronic condition such as HTN, the proper management are closely related with adherence to the standard treatment guideline (Allu et al., 2010). However; the

concomitant use of CAM with hypotensive drugs may negatively affect the health outcome (Kretchy et al., 2014). Therefor; it is imperative to investigate the trend of CAM use in HTN and understand the motives that lead the patient to pursue and maintain this practice.

This study aimed:

i. To determine the use and seeking behavior of CAM among hypertensive patients; as well as, find the effect of demographic characteristics.
ii. To assess hypertensive patients' attitudes towards CAM before and after the educative intervention;
iii. To evaluate patient-doctor communication about CAM in terms of disclosure rate and attitudes towards it before and after the educative intervention;
iv. To evaluate the effect of health-related quality of life (HRQoL) of hypertensive patients, and hypertension-related knowledge (HTN-RK) in the context of CAM.

1.2 Justification of the study

Within the area of research, studies evaluating the use of CAM among hypertensive patients are very limited. Previous literatures have investigated the use of CAM among cancer patients (Boon et al., 2000, Broom et al., 2009, Farooqui et al., 2013, King et al., 2015). The most available information from the previous studies is confined with the prevalence and reasons of using CAM; as well as, the effect of socio-demographic characteristics.

Notably, previous investigations have reported the occurrence of adverse reactions, toxicity, and mechanical injuries due to the use of CAM (Ernst and White, 1997,

Peuker et al., 1999). Up to the knowledge, information on patients' perceptions of the adverse effects associated with the use of CAM is not available. Therefore; the adverse reactions resulted from the concomitant use of CAM with hypotensive pharmacological treatment need to be investigated.

Few studies have addressed issues regarding patients' motives and attitudes towards CAM. Very little is known on how hypertensive patients perceive CAM; nor what attitudes they possess towards it. In this regard, cultural and religious characteristics have been reported to have an effect on individual's expectations towards CAM (Eisenberg et al., 1998, Huber et al., 2004). Literatures from Middle East still lacking data on how hypertensive patients perceive CAM therapy according to the religious and cultural factors. In addition, there is a lack of information on believes in the natural product; as well as, the perceived effectiveness of it over the conventional medicine.

Patient-doctor communication on HTN also affects patients' treatment seeking behavior (Malik et al., 2014). However, this issue is poorly explored in the context of using CAM in the control of high blood pressure. Evaluation of Health-Related Quality of Life (HRQoL) of hypertensive patients in general and in the context of CAM would help to provide better opportunities to improve the patient's health status. Moreover, HTN-Related knowledge (HTN-RK) has often investigated in the medical texts and linked with the effective management of HTN. Up to this date, data on HTN-RK from Iraq is still not available. In addition, none of the previous studies have detected the effect of HTN-RK in the selection of CAM. Furthermore, patient's education programs about CAM for patients with chronic diseases are scarce. Incorporating educative interventions about CAM for hypertensive patients are necessary.

1.3 Country profile

Iraq is a country of Arab region with a population of 34 million people (Fathelrahman A et al., 2016). Demographic indicators of the country are presented in Table 1.1. In ancient times Iraq was known as Mesopotamia, the center, of ancient Babylonian and Sumerian 6th millennium BC. During that **t**ime, early records of drug therapy were recorded on cuneiform clay tablets (Roux, 1992). Some of these therapies are still in use to this date (Borchardt, 2002). The capital city Baghdad witnessed the emergence of the first apothecary in the world 754 AC (Duffin and Li, 1995). By the advent of the twentieth century, specifically in 1923, the first act was launched to regulate the health system in the country.

In the fifties of the last century, Iraq witnessed a great development and prosperity in its health and economic situation because of its oil wealth. Sadly, it sustained a tragic decline through three dark periods. The Iraq-Iran war (1981-1988); the Gulf war and the imposed embargo by United Nations (1991-1998); and the US-led invasion (2003-2011) to change the regime in Iraq (WHO, 2006). In consequence, Iraq suffered a tremendous loss of human resources; collapse in security; deadly sectarian violence; killing and kidnapping of scientific personnel. All led to the fled of more than 3 million of Iraqis to the other countries (Sansom, 2004). The health system was not excluded from those influences that have swept the country.

The health system in Iraq is regulated by the Ministry of Health (MOH). The MOH is the main body responsible of providing health care and treatment services at a low cost to the population through its public constructs. These include 173 public hospitals, 66 teaching hospitals, 2538 primary health centers (SIP, 2013). The health care system in Iraq has been on a centralized, curative and hospital-oriented model. The current

structure of public health care is not based on cost-effective interventions that would ensure maximum health gains for available resources. Neither is it capable of responding effectively and efficiently to the complex and growing health needs of the population (WHO, 2006). The health status of Iraq's population has suffered major blows due to decades of war and economic sanctions. This has resulted in a severe drop in Iraq's gross domestic product and consequently its public expenditure on health (WHO, 2015b). Health services have deteriorated, and the sector has faced continuous shortages in drugs and other supplies. Moreover, the current ongoing conflict and poor security situation has further damaged the country's health infrastructure. Many health professionals have fled for safety to neighbouring countries and abroad and the population's access to basic health services has become increasingly impaired.

Table 1.1: The demographic indicators of Iraq

Category	Indicator
Total population	34,207,248
Total male	17,419,724
Total female	16,787524
Life expectancy at birth (years)	69.6
Total median age (years)	21.1
Annual population growth rate	3.4
Urban population (% of total population)	66
Crude birth rate/1000 of the population	38.1
Crude death rate/ 1000 of the population	3.9
Literacy (% of total population)	78.2
Religions (% of total population)	Muslim 97, Christian and others 3
Language (officials)	Arabic, Kurdish

1.4 Definition and classification of hypertension

It is difficult to find a specific definition for HTN since there is no clear cut off value between normal and high blood pressure (WHO, 1996). However, several operational definitions have been proposed over years. The earliest notion held that HTN is not regarded to a distinct threshold of blood pressure rather it is a factor of associated cardiovascular risk (Evans and Rose, 1971). Consequently the following definition was suggested "The level of blood pressure at which detection and treatment do more good than harm" (Evans and Rose, 1971). Scientists have focused also on the value of diastolic blood pressure in the manifestation of HTN. However, researchers in this area have confirmed that systolic blood pressure should be considered as it is strongly associated with cardiovascular risk (Miall et al., 1987). Based on this evidence, a systolic blood pressure of 140 mm Hg or above, or a diastolic blood pressure of 90 mm Hg or above was the definition of HTN (Mashiba et al., 1993). Following that, a category of pre-hypertension with blood pressure standard of 120/80 mm Hg to 139/89 mm Hg was promulgated by the Joint National Committee (JNC) (Armstrong, 2014). Together with the fact that blood pressure is variable and the value of it differs according to the age and ethnic groups (Greene and Harris, 2008). Classification of blood pressure is presented in Table 1.2.

It became of importance in the detection of HTN to do repeated measures of blood pressure level over several weeks (Greene and Harris, 2008). This has made it clear that HTN cannot be categorized according to a distinct blood pressure thresholds (Giles et al., 2009). As a result, the following definition was suggested "a condition in which blood pressure is elevated to an extent where benefit is obtained from blood

pressure lowering" (Walker, 2011). This later definition is adopted nowadays by large-segment of scientific papers; as well as, it will be applied also in this thesis.

Table 1.2: Classification of blood pressure

Category	SBP mm Hg	DBP mmHg
Normal	<120	<80
Prehypertension	120-139	80-90
Hypertension, stage 1	140-159	90-99
Hypertension, stage 2	≥160	≥100

SBP: systolic blood pressure, DBP: diastolic blood pressure
Source: (Armstrong, 2014)

The identifiable risk factors of HTN include stroke, heart attacks, and renal failure (Kearney et al., 2005). These relative risks could be prevented if a moderate reduction in blood pressure is achieved (WHO, 1996). It is classified as either primary (accounts of 90-95%) due to unidentifiable medical illness or secondary that resulted from a known factor (Walker, 2011). Genetic and some other factors were found to increase the likelihood of primary (essential) HTN (Beevers et al., 2001). Risk factors for primary and secondary HTN are presented in Table 1.3.

Table 1.3: Risk factors for hypertension

Primary HTN (90-95%)	Secondary HTN (5-10%)
• Genetic effect • High salt intake • Fatty food • Smoking • High intake of alcohol • Poor life style	• Renal disease • Endocrine disease • Vascular causes • Drugs (steroids, cyclosporine, NSAIDs, and oral contraceptive)

Source: The pathophysiology of hypertension (Beevers et al., 2001), HTN: hypertension

1.5 Global epidemiology of hypertension

The global prevalence of adults diagnosed with HTN is approximately 40% (WHO, 2013a). This prevalence varies by different regions of the world, with the highest incidence (46%) in Africa and the lowest (35%) in America (WHO, 2013a). This non-communicable disease is expected to increase by 29% in 2025 due to the growth of population, aging, unhealthy food, poor physical activity, obesity, excessive intake of alcohol, and continuous stress (Kearney et al., 2005). In addition, it has been included in the list of the most chronic diseases that resulted in morbidity and mortality worldwide (James et al., 2014). The annual heart disease and stroke deaths due to HTN are at least 45% and 51% of total deaths respectively (WHO, 2013a).

In Iraq, the prevalence of HTN for adults is 38.5% (MOH, 2012a). Similar to the global data; it is the most identifiable risk factor of heart diseases that shape the highest mortality rate in the country (MOH, 2012b). Non-communicable diseases were estimated to account of 61.6% of all deaths in Iraq; and 33.2% of this percentage is due to cardiovascular diseases (WHO, 2015b). Before the year 2003, the control of chronic diseases in Iraq has received a good attention and most of the pharmacological

treatment were supplied free of cost to all registered patients through MOH public clinics (Fathelrahman et al., 2016). Some good strategies by MOH were adopted for optimal management of chronic diseases like HTN and diabetes, like increasing public awareness about communicable and non-communicable diseases. Sadly, today's health system in Iraq is suffering a lot because of the devastation and the destruction that took place in the country after the 2003 U.S. led invasion. The continuous public exposure to the stress and violence of the current situation in the country may hinder the policies formulated by Iraqi MOH for the proper control of chronic diseases. In addition, this may affect the behavior of Iraqi patients in seeking a treatment and push them to pursue some cultural self-treatment practices. Consequently, this will make the control of blood pressure a difficult task.

1.6 Treatment of hypertension

The management of HTN consists of both pharmacological and non-pharmacological modes (WHO, 1996, Walker, 2011). Evidences approved that treatment of HTN has reduced the incidence of stroke (35-40%), myocardial infarction (20-25%), and heart failure (50%) (WHO, 2013a). A considerable classes of drugs are approved to be effective in the control of blood pressure and prevention of the associated cardiovascular damage (Walker, 2011). These include diuretics, β-blockers (BB), calcium channel blockers (CCB), calcium antagonists (CA), angiotensin converting enzyme inhibitors (ACEI), angiotensin receptor blockers (ARB), α-blockers, centrally acting vasodilators, and direct-acting vasodilators. A summary of hypotensive drugs is seen in Table 1.4. For optimal management of the condition, a drug with minimum side effect is recommended (WHO, 2013a). It should be noted here that details about

hypotensive drugs will not be discussed in this thesis as the pharmacology and therapeutic books are very informative in this regard.

Table 1.4: Summary of hypotensive drugs

Drug class	Examples	Comment
Diuretics	• Thiazide: bendroflumethiazide • Loops: furosemide • K-sparing: spironolactone	• Cheap and effective • Especially for patients with cardiac failure • Especially for resistant hypertension
B-blockers	• Atenolol • Propranolol • Metoprolol • Labetalol • Celiprolol	• Cheap • Adverse effect common • Less effective in cardiovascular events • For patients with ischemic heart disease
Calcium antagonists: dihyropyridine	• Nifedipine • Amlodipine	• Not well tolerated • For elderly patients and those with ischemic heart diseases
Calcium antagonists: rate limiting	• Verapamil • Diltiazem	• Well tolerated and suitable for patients with ischemic heart diseases • Caution needed when used in combination with β-blockers
ACE inhibitors	• Captopril • Enalapril • Lisinopril • Perindopril • Ramipril	• More expensive, cough very common, appropriate for use in younger patients and those with cardiac failure or diabetes
α-blockers	• Prazosin • doxazosin	• more expensive, adverse effects common
Angiotensin receptor blockers	• Losartan • Valsartan • Irbesartan	• More expensive, especially for patients in whom ACE inhibitor is not well tolerated to cough
Centrally acting vasodilators	• Methyldopa • Moxonidine	• Poorly tolerated, used only in severe hypertension or hypertension of pregnancy
Direct-acting vasodilators	• Diazoxide • Minoxidil • Nitroprusside	• Poorly tolerated, used only in severe hypertension

Source: Clinical pharmacy and therapeutics book (Walker, 2011)

For effective prevention and management of HTN; non-pharmacological approach is recommended as the first step in the treatment (Appel et al., 2003). This includes a control of calories and saturated fat intake, weight reduction, physical fitness through aerobic exercise, diet with fruit and vegetables, reduction of dietary sodium, cessation of smoking, and reduction of alcohol intake (Whitworth, 2005, Burnier, 2015). The influence of healthy life style on patient's blood pressure is not less than the effect that resulted from the standard pharmacological treatment (Mashiba et al., 1993, JNC, 2003). Thus, it is vital for hypertensive patient to adhere to the non-pharmacological approach and the recommended life-style changes for optimum control of blood pressure. Despite the benefit of non-pharmacological treatment; many studies have found that the preparedness of hypertensive patients to adhere to the life style changes is not achieved (Mellen et al., 2008, Hu et al., 2013a, Motlagh et al., 2016). This in turn may increase the risk of cardiovascular consequences. One way for the best control of blood pressure is to support patients' self-care and educate the patient about the importance of adopting a healthy life style (Chobanian et al., 2003, Yang et al., 2014). Patient's self-care is "The capability of people, families, and communities to take part in health promotion and protection, disease prevention, and dealing with illness and disability either with or without the support of a health care provider" (Webber et al., 2013). For the benefit of public health, a considerable effort has been done to boost patient's self-care in HTN. Unfortunately, global reports have revealed that the control of this chronic condition is not at the required level (Dorobantu et al., 2010, Cai et al., 2012, Kaur et al., 2012). For many patients, the control of blood pressure continues to be a challenge despite the effective pharmacological and life-style interventions.

1.7 Definition of CAM

The discipline of CAM embraces a wide scope of practices that changing constantly making the definition of it a difficult task. They are not the same as the pharmacological treatment which is also known as conventional treatment or evidence-based medicines. Hence, there is a question "what is complementary and alternative medicines?" surrounding the use of this trend of treatment. The term itself holds two-distinct meanings that differ greatly. Complementary medicine means the therapy that is used together with the pharmacological standard treatment, such as the use of sports in the management of HTN (Kim et al., 2002, NCCIH, 2005). However, alternative medicine is the therapy that is used instead of the pharmacological treatment (Kim et al., 2002, NCCIH, 2005). The term CAM is used in most of the literatures to describe any practice of treatment that fall out of the category of pharmacological standard drugs (Zollman and Vickers, 1999). Several definitions of CAM have been evolved during the last two decades. Eisenberg and his colleagues defined CAM as "medical interventions not taught widely at U.S. medical schools or generally available at U.S. hospitals" (Eisenberg et al., 1993). In an attempt to understand what exactly CAM is?; Zollman and Vickers introduced another definition of CAM as "CAM is a broad domain of healing resources that encompasses all health systems, modalities, and practices and their accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture in a given historical period" (Zollman and Vickers, 1999). Then, the WHO has introduced a more practical definition of CAM embracing the cultural context and stated that CAM is "the sum total of the knowledge, skill, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or

treatment of physical and mental illness" (WHO, 2000). This was later updated by the National Centre for Complementary and Integrative Health (NCCIH) that defined CAM as "a group of diverse medical and healthcare systems, practices, and products that are not currently part of conventional medicines" (NCCIH, 2011). For this study, this later definition is adopted within this thesis.

1.8 Classification of CAM

The practice of CAM includes many groups of diverse therapies that all fall outside the medical school curricula (Fries, 2008). However; a category of one group may overlap with the category of another group thereby brings difficulties in producing a precise theoretical classification. The NCCIH classified CAM therapies into four different overlapping groups (NCCIH, 2011). Each group encompasses a variety of products that have the same concept of therapeutic properties. These groups are presented in Table 1.5.

Table 1.5: Classification of CAM

Category	Definition	Examples
Biological Based Therapies (BBT)	The use of substances found in nature for healing purposes and promoting the health.	Herbals, dietary supplements, vitamins and minerals.
Alternative Medical System (AMS)	A system of theories and practices that sit outside the standard pharmacological treatment.	Traditional chines medicine, homeopathy, and cupping or Alhijama in Islamic tradition.
Manipulative Body Based Therapies (MBBT)	A technique of manipulation or movement of parts of the body.	Massage, aromatherapy, and reflexology.
Mind-Body Therapies (MBT)	This technique based on the principle that the mind has the greatest effect on body's activities.	Meditation, biofeedback, hypnosis, and yoga.

Source: National Centre of Complementary and Integrative Health, (NCCIH, 2011)

1.9 The history of CAM in Arab world

The idea of using natural products to treat different elements in Arab countries is not new. Arabic culture; like Greek, Chines and Indian cultures; has a long history in understanding the disease and find probable therapies for the diagnosis and treatment of different ailments (Azaizeh et al., 2010). Traditional remedies used by Arab society arose from historical, cultural, and religious perspectives (Nagamina, 2003). The Arab regions have been characterized through generations by an abundant inventory of traditional medicine (Azaizeh et al., 2006). The traditional medicine in this region of the world consisting mainly of medicinal herbs and some cultural practices. The first evidence of using herbs goes back to the Sumerian civilizations in Iraq (3000-1970 BC) (Al-Douri, 2014). Prescriptions of herbal remedies were found engraved on cuneiform clay tablet; these were uncovered in 1960 (Fathelrahman A et al., 2016).

During the Babylonian period (1970-589 BC), the king Hammurabi has released 285 compulsory rules, one of them specifically indicated the medicine and herbal use; as well as, medical practice (Al-Douri, 2014). In the 8th century, traditional medicine has been flourished and physicians' prescriptions included mainly herbal preparations in their crude form for the cure of the disease. During that time, the first pharmacy in the world appeared in Baghdad (the capital of Iraq nowadays) where herbal preparations were dispensed in the form of oils, teas, syrups, ointments, and powders (Fathelrahman A et al., 2016). Among famous physicians (Hakeem) in the Arab world were Al-Razi (850-923 AD) and Ibin Sina or Avicenna (980-1038 AD) who wrote "Al-Qanoon fil-Tib" (Law of medicine) (Al-Douri, 2014). In addition, the famous botanist and pharmacist was Albetar (1021-1080 AD) (Al-Douri, 2014). Their books and medical articles maintained a considerable importance to the medical teaching in the West until the end of 16th century (Azaizeh et al., 2006).

With the emergence of Islam (the dominant religion of this area) in the 7th century AD (Gordon, 2005); a further knowledge about disease prevention and treatment was added in the Arabian Peninsula (Al-Rumkhani et al., 2005). A complete system of therapy both for the soul and the body was gifted by the God to the prophet Muhammed, the prophet of Islam (Al-Rumkhani et al., 2005). The Quran, the holly book of Islam, has addressed all matters relating to the life and worship. Some versus of the Quran recommend the use of special food such as the date *(and shake towards you the trunk of the palm tree, it will drop on you ripe, fresh dates.* Verse (19:25) Surat Maryam). Another mention was the honey (*then eat from all the fruits and follow the ways of your Lord submissively. There emerges from their bellies a drink, varying in colors, in which there is healing for people,* Verse (16:69) Surat Al-Nahil). Other versus, mentioned that reading Quran resulted in healing of the soul (*O mankind, there*

has to come to you, instruction from your Lord and healing for what is in the breasts and guidance and mercy for the believers, Verse (10:57) Surat Yunus).

With these divine revelations, the prophet Muhammed guided the Muslims to pursue healthy habits that lead to a healthy life (Wakim, 1944). The adoption of the prophet therapy in the Arab world was justified as being in congruence with the faith of Islam. Islamic opinions on the treatment and the prophetic traditions were known later by Muslim society as "Tibb Al-Nabawi" (Al-Rumkhani et al., 2005). One of the most familiar practices of "Tibb Al-Nabawi" is "Alhijama" which is known as cupping in Western countries. By this practice, the blood is drawn from various points in the body through the concept of applying a vacuum above the skin with a special tool or cup. Soon after removing the vacuum, small incisions are made on the skin using a surgical or razor blade to withdraw the unwanted blood from the body. Generally, traditional healer without formal medical education performs this practice (Ibrahim IR et al., 2014). For hundreds of years, Alhijama maintain popularity among Arab society for several conditions like HTN, musculoskeletal pain, heart disease, and skin conditions. Yet, a controversy about the safety and effectiveness of this practice remains in the scientific medical texts. Within this thesis, the scenario of CAM usage will be presented under the patronage of Arab world. Hence, the traditional Arabic practices of healing will be added to the previous classification as a form of alternative medical system.

1.10 Overview of thesis

This thesis explores an important subject related to some hidden patient's self-practices; in this scenario the use of CAM by hypertensive patients. Chapter one is a brief introduction to what this work will address with the sought objectives. It gives a

snap shoot about HTN and its recommended treatment; a brief definitions and classifications of CAM; and the history of CAM among Arab population. Chapter two explores the review of previous literatures on CAM in accordance to the objectives of this study. It discusses the most documented theoretical models that explain patient's behavior in searching treatment; as well as, educational interventions tailored to the patients. Lastly, the chapter will be ended up with statement of the problem and the conceptual framework of this thesis. Chapter three will present in detail the two different methodologies that adopted for this work; in addition, the educational intervention that carried out among the respondents. In chapter four, the qualitative inquiry will be discussed with the concluded themes that conceptualize the variables of the quantitative phase. Chapter five, presents the quantitative results on the prevalence, patterns of use, reasons, and patient's expenditure on CAM. It also explores some adverse effects that perceived to be resulted from the use of CAM. Chapter six discussed the results of patients' attitudes towards CAM; as well as, patient-doctor communication about CAM and attitudes towards disclosure. In chapter seven, the two important measures "HRQoL" and "HTN-RK" will be evaluated and their contribution in the context of CAM will be addressed. Chapter eight presents the outcome after implementing the CAM-education intervention for hypertensive patients, and the effect of educative information on patients' attitudes towards CAM and communication with the physicians. Lastly, chapter nine draws the conclusion of this thesis and the limitations of the adopted methodology. In addition, it outlines in brief some recommendations for the future researches.

CHAPTER TWO - LITERATURE REVIEW

2.1 Introduction

The scenario of this chapter discusses the previous researches on CAM use in the control of blood pressure in different part of the world. It will explore the prevalence, reasons of this practice; as well as, patient-doctor communication with about it. Conceptual models that explain patients' behavior in seeking treatment will be included in this chapter for the adoption of the most suitable model that may explain patient's use of CAM. Consequently, the conceptual framework of this thesis will be the end of this chapter.

2.2 Epidemiology of CAM use among hypertensive patients

Previous studies in this area revealed a specific behavior among hypertensive patients characterized by using CAM to control the blood pressure without medical consultation (Ziyyat et al., 1997, Vora and Mansoor, 2005, Ali-Shtayeh et al., 2013, Nuwaha and Musinguzi, 2013, Kretchy et al., 2014). This non-drug modality of treatment have generally subjected to fewer thorough clinical trials to proof their safety and effectiveness (Brook et al., 2013). The diagnosis of HTN may be frustrating for patients and their families. The situation increases when the patient suffers the complications of the condition or ending with longstanding hypertension. Despite the measurable benefit of the standard therapy in lowering the high blood pressure; a tendency to use CAM for HTN is noticed in the scientific literatures. A study conducted in Singapore to evaluate the prevalence of CAM usage among patients with chronic disease. The highest number of participants were hypertensive patients

(407/488). The rate of CAM use for 1 year was 22.7% (111/488). The most frequently utilized CAM were traditional chines therapy, traditional dietary therapy, and acupuncture (Lee et al., 2004).

In the United States, data revealed that CAM usage among patients with cardiovascular disease was 68% (7336/10572). Among respondents with HTN; MBT (8%) and herbal products (6%) were the most utilized type of CAM to control the blood pressure. The frequently used practices of MBT were meditation, guided imaginary, yoga, hypnosis, and energy healing. Of those who preferred herbal therapy; echinacea (*Echinacea purpurea*), garlic (*Allium sativum*), ginseng (*P ginseng*), ginkgo biloba (*Ginkgo biloba*), glucose amine, and ginger (*Zingiber officinale*) were the most consumed herbs. Added to this; fish oils, omega fatty acids and soy supplements were also used (Yeh et al., 2006).

In Nigeria, a study conducted among hypertensive patients attending an urban tertiary care center. The rate of using CAM was 39.1% (88/225) and herbals were the most utilized type of CAM. Garlic (*Allium sativum*), some native herbs, ginger (*Zingiber officinale*), bitter leaf (*Vernonia amygdalina*), and aloe vera (*Aloe vera*) were the most frequent used herbs. To a less extent, spiritual therapy was also used in the control of blood pressure (Amira and Okubadejo, 2007).

A study from Malaysia which was conducted among 300 hypertensive patients attending out-patient clinic in the capital city Kuala Lumpur in 2018. The finding revealed that CAM was used by 62.6% (184) patients to control the blood pressure. The most utilized types of CAM were bitter ground (34.4%), garlic (17.0%), and Misai Kucing (14.6%). A prediction model detected that being Muslim, non-blue collar, and

having higher diastolic blood pressure were the only predictors of using CAM (Siew-Mooi et al., 2013).

Another study conducted in China, a high rate of CAM use (74.2%; n=236/318) among hypertensive patients was recorded. Interestingly, most kinds of CAM were utilized by the chines patients to control the elevated blood pressure. These were traditional chines medicines, acupuncture, cupping, prayer, relaxation, massage therapy, herbal medicines, probiotics, Omega3, vitamins and dietary supplements (Hu et al., 2013b).

Another study conducted in Turkey in an outpatient clinic of a general hospital to assess the use of CAM. Information from hypertensive patients revealed a prevalence of CAM usage of 63.8% (n=53/83). However, herbal therapy and prayer were the only form of CAM that used to control the blood pressure among Turkish hypertensive patients. Data from this study confirmed the growing interest of CAM among this category of patients around the globe (Mollaoğlu and Aciyurt, 2013).

Information from Africa showed a low tendency to pursue CAM in the management of HTN. In South Africa; a study conducted among 135 African hypertensive patients. It was indicated that the prevalence of using CAM among this patient category is 21%. Herbal preparation in a form of tea mixture or other composition was the only utilized type of CAM (Hughes et al., 2013). From the east of Africa; another study was conducted in Uganda among 258 hypertensive patients. Although the use of CAM was common but a low rate of 28.65% was reported. Herbal remedies was exclusively the most utilized type of CAM (Nuwaha and Musinguzi, 2013). While from the west part of Africa; data from Ghana indicated a prevalence of 19.5% use of CAM by 400 hypertensive African patients. Herbal extracts were also the only form of CAM that is used to control the blood pressure. These herbs were bitter leaves (*Vernonia*

amygdalina), garlic (*Allium sativum*), dandelion (*Taraxacum officinale*), pear leaves (*Pyrus amygdaliformis*), cotton plant (*Gossypium herbaceum*), and some herbal mixtures (Kretchy et al., 2014). The popularity of CAM in the management of HTN seems to be at a lower rate in different part of Africa compared to the rate of using this practice in Asia and America. In addition, CAM therapy in this region of the world is characterized by using only BBT as a form of herbal tea or other plant extract.

By this review, it is evident that treatment with CAM to control the blood pressure became a popular practice not only in the developing countries but also in the developed industrialized countries. Within the context of health care, it is crucial to understand the growing interest of this trend and provide the evidence-based information about CAM not only to the patients, but also to the health professionals, researchers and health policy makers.

2.2.1 The use of CAM among hypertensive patients in Arab region

Since early times, the prevalence of CAM treatment for variety of illness has been recognized among Arab society. As pointed before, CAM therapy has originated from historical, cultural, and religious heritage of this region. Medicinal herbs and "Alhijama" are the most recognized approach of CAM. Herbal remedies are considered as part of Arab culture and are available in local markets either in their crude forms or prepared in a special mixture by a local herbalist who often lacks formal education. These products are not subjected to any regulation and are sold in the markets as dietary supplements (Ibrahim, 2014). Up to the knowledge, only few studies have outlined the use of CAM by patients diagnosed with HTN in the Arab region. In Morocco, ethnobotanic survey revealed a high prevalence (80%) of herbal

use among hypertensive patients. Seventy-three plants were often used in the management of HTN and other cardiac disease. Treatment with medicinal herbs considered as an integral part of the whole Moroccan healthcare system (Eddouks et al., 2002). Another study conducted in Jordan revealed a prevalence of 39.6% of using CAM among 636 hypertensive patients. Notably, "Alhijama" was used more than herbal preparation in the control of blood pressure. A variety of medicinal herbs was used by Jordanian hypertensive patients like roselle (*Hibiscus sabdariffa*), ginger (*Zingiber officinale*), olive leaves (*Olea europaea*), green tea (*Camellia sinesis*), linseed (*Linum usitatissimum*), nigella black seed (*Nigella sativa*), vinegar, and garlic (*Alium sativum*) (Wazaify et al., 2013). From Palestine, data showed a high prevalence (85.7%) of using CAM in the management of HTN. BBT characterized by using 83 types of herbs was the most frequently utilized CAM. Other types of CAM were also used including diet, exercise, prayers, "Alhijama", massage, aromatherapy, acupuncture, and magic (Ali-Shtayeh et al., 2013).

Within the context of Iraq, it was found that the traditional medicine depends on herbal remedies and some local folk practices (Ahmed, 2016). The use of CAM was categorized as an ancient time therapy that grew out of Mesopotamian civilization 6000 B.C (Albayaty, 2011). Plants and animal products provided the fundamental ingredients of medical therapy during that time. Old prescriptions of medicinal herbs were engraved on cuneiform clay tablet by the Sumerians 5000 years ago (Roux, 1992). The diversity in the geographical area and climate of Iraq has resulted in a considerable difference in wild plants (Ahmed, 2016). Unfortunately, studies evaluating the use of traditional medicine by Iraqi society are not adequately documented in the scientific literatures. Despite the paucity of Iraqi data concerning alternative medicine; it is worth mentioning some few studies that been documented

in the scientific medical journals. Al-Douri in her interview with 75 herbalist of Iraq reported that a total of 53 species of plants were found at their shops to treats different diseases (Al-Douri, 2014). The commonly utilized plants in the herbalist's shops were babonage (*Anthemis nobilis)*, darceen (*Cinnamomum zeylancium)*, erksoos (*Glyeyrrhiza glabra)*, helba (*Trigonella Foenumgraceum)*, shaie kogarat (*Hibiscus subdarifa)*, krenfel (*Eugenia caryophyllus Spreng)*, habit helwa (*Foeniculum vulgare)*, yansoon (*Pimpinella anisum*), habit soda (*Nigella sativa)*, erk haar (*Zingiber officinale)*, kurkum (*Curcuma longa)*. Although participated herbalists claimed to have a comprehensive knowledge about phytotherapy; none of them had a license of dispensing herbal products. Around 70% of them do not have a formal level of education. In addition, some of the plants sold in the Iraqi market were imported and stored for an indefinite time.

Another interview was carried out in the Northern part of Iraq with 45 traditional healers. The study revealed that 66 plant species were sold in the market for the treatment of a variety of ailments. The most commonly sold plants by the herbalists for the control of blood pressure were garlic preparations, Cinnamon (*Cinnamomum cassia)*, rosella flowers (*Hibiscus sabdariffa)*, flax leaves (*Linum usitatissimum)*, wild chamomile (*Matricaria chamomilla)*, and ginger (*Zingiber officinale)*. Added to this, inhabitants of this part of Iraq have a strong belief in traditional therapies as a way of good health (Ahmed, 2016)

It is important to mention that the outcomes of those studies conducted in Iraq were confined to an interview with certain traditional healers. This necessitate the need to conduct more comprehensive studies to give a profile of CAM use by Iraqi patients. Despite the considerable amount of modern medicine available in the country; the

traditional medicine still maintained publicity for historical, religious, and cultural reasons. Iraq has an herbal medicine practice act (Act 105, no.89, 1981) which has been launched after establishing the center of herbal medicine affiliated to the MOH. The committee of this center is responsible mainly for the approval of selling herbs to the public; therefor, the herbalist (Al Attar) has to obtain this license first before opening his herbal shop and practicing this job later. According to this law, the applicant to the license must (1) attain at least a primary school degree (with an exception to those who inherited this experience; (2) pass the interview with the committee to show the competence; and (3) have a medical examination that confirm that the applicant is in good health and free from any transmitted disease (A country document of this law is available in Appendix A). Up to this date, the role of this center is restricted to authorize the license only. Other functional body that is accountable for providing the information and promoting in-depth investigations on CAM is not recognized in the country.

2.3 Determinants of using CAM

The reasons beyond self-treatment with CAM have been much discussed in medical literatures. Patient's intension to pursue CAM is a complex process that involve many issues. Various factors have been reported in different studies explaining the growing interest in the trend of CAM. However; the comprehensive model that account for the popularity of this phenomenon is yet not available.