CRUDE HERBS USAGE AMONG PATIENTS WITH HYPERTENSION LIVING IN A SUBURBAN SETTING OF MALAYSIA

By

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ABSTRACT

CRUDE HERBS USAGE AMONG PATIENTS WITH HYPERTENSION LIVING IN A SUBURBAN SETTING OF MALAYSIA

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Hypertension is a worrying health condition with three out of ten Malaysian adults being diagnosed with hypertension in 2019. Study objectives were to determine the prevalence, predictors and perceptions crude herbs use to manage hypertension among primary care outpatients; to identify the diversity of crude herbs being integrated in managing hypertension; to compare the health-related quality of life of hypertension patients who are taking crude herbs and who are not taking crude herbs. Firstly, a systematic review on herbs use to manage hypertension was conducted. A cross sectional study was done in a Malaysian government health clinic to determine the prevalence and diversity of crude herbs use. The international complementary and alternative medicine questionnaire (I-CAM-Q) was modified to determined crude herbs use while SF36 assessed HRQOL measurements. A qualitative study was employed and explored the perceptions of patients used crude herbs with conventional medicine. The systematic review showed the prevalence of herbs used ranged

from 6.5% to 69.0%. For quantitative study, 294 participants were recruited; most were female (n=154) and Malays (n=122). Prevalence of crude herbs users was 30.6% with pegaga (*Centella asiatica)* being the most common herb. There are a total of 52 different combinations of known crude herbs that were reported by the patients. Crude herbs use was significantly higher among patients with secondary education, from Malay or Indian ethnic groups, high systolic blood pressure (above 140 mmHg) and experienced falls or muscle pain. For HRQOL domains, no significant difference (p>0.05) was noted between users and non-users of crude herbs. This study identified different types of crude herbs usage gave no significant impact on HRQOL among hypertensive patients on medication. The patients perceived that crude herbs use are traditional, natural and gave no side effects. A guideline and information on evidence-based crude herbs usage targeted to patients on medication is warranted.

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I hereby declare that the dissertation is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UTAR or other institutions.

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Date: 26 January 2023

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LIST OF ABBREVATIONS

WHO	World Health Organisation
NHMS	National Health & Morbidity Survey
CAM	Complementary and Alternative Medicine
CPG	Clinical Practice Guidelines
SBP	Systolic Blood Pressure
DBP	Diastolic Blood Pressure
ACE	Angiotensin Converting Enzyme
NCCAM	National Center for Complementary and Alternative Medicine
HRQOL	Health-Related Quality of Life
NMRR	National Medical Research Register
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
AXIS	Appraisal Tool for Cross-Sectional Studies
KK	Klinik Kesihatan

I-CAM-Q	International Complementary and Alternative Medicine Questionnaire
BM	Bahasa Melayu
IDI	In-depth interview
CJID	*Centella asiatica*, *Justicia gendorussa* and *Imperata cylindrica* concoction
SOD	Superoxide Dismutase
NOX	NADPH Oxidase

CHAPTER 1

INTRODUCTION

1.1 Research Background

Hypertension is a common health condition which can lead to chronic conditions like heart failure, stroke, renal failure and myocardial infarction if not managed and treated in its early stages (Naing et al., 2015; Ab Majid et al., 2018). A total of 7.5 million mortalities worldwide were reported due to hypertension, making it the leading cause death across the globe (WHO, 2019). The overall prevalence of hypertension in Malaysia according to National Health and Morbidity Survey (NHMS) 2019, was 30.0% showing a slight decline from the 30.3% obtained in NHMS 2015 (NHMS, 2019). Among the Malaysian patients, the management of hypertension is still challenging as many diagnosed with hypertension undergo treatment but only one fourth of patients were able to achieve blood pressure control (Ng et al., 2017). This is due to numerous barriers such as lack of physician counselling, non-adherence to medicine and the fear of life-long medication prescription (Devkota et al., 2016).

Self-management practices to control blood pressure and reducing hypertension related complications such cardiovascular diseases has become increasingly common and essential in the overall management of hypertension

(Hu et al., 2013). Self-management for hypertension management is an active and robust method which required attitude, determination, knowledge, commitment, discipline, self-efficacy, empowerment and self-regulation. It encompasses various practices including lifestyle modifications such as increased physical activity and reducing alcohol consumption (Hu et al., 2013). Recently, patients have started to practice Complementary and Alternative Medicine (CAM) as one of the forms of self-management to control hypertension (Rahmawati and Bajorek, 2017). In previous studies, the prevalence of hypertension patients using CAM ranged from 19.5% to 85.7% (Ali-Shtayeh et al., 2013; Osamor and Owumi 2010, Mahfudz and Chan, 2005; Lulebo et al., 2017; Kretchy Owusu-Daaku and Danquah, 2014). A type of CAM under the category of biological based therapies is crude herbs which defined as the raw plant before it is processed or dried (Saeed et al., 2018). According to a survey by the Ministry of Health Malaysia, crude herbs were estimated to have among Malaysians utilizing biological based therapies (Siti et al., 2009). The prevalence of herbs use for hypertension management was 6.5% to 69.0% (Mahfudz and Chan, 2005; Tajadini et al., 2013; Bahar et al., 2013; Amira and Okubadejo, 2007; Olisa and Oyelola, 2009; Ali-Shtayeh et al., 2013; Gohar et al., 2008; Hu et al., 2013; James et al., 2018; Kretchy, Owusu-Daaku and Danquah, 2014; Peltzer, 2004; Peltzer and Pengpid, 2019; Wazaify et al., 2013).

The reasons behind why patients decide to utilize crude herbs have not been completely understood. Some patients, especially from developing

countries have deep rooted believes in the healing potential of plants as they describe these plants to have no side effects unlike conventional medicines (Ali-Shtayeh et al, 2013; Lulebo et al., 2017). Other factors include low cost, ease of accessibility and long history of medicinal plants usage (Humidat and Khamaysa, 2014). Patients from Iraq have also taken herbal products as a support for standard conventional treatment, to reduce symptoms of the disease and as part of Arabic culture and tradition (Ibrahim et al., 2017). The reasons for taking crude herbs may vary depending on the cultural and religious backgrounds of the study population. Hence, it is important to understand why Malaysian patients resort to taking crude herbs to manage hypertension.

Hypertension patients often do not disclose information on their usage of crude herbs to their physician due to the fear of being admonished. This is dangerous as patients are unaware that the concurrent use of herbs and conventional medicine which may lead to unwanted herb-drug interactions (Azizah et al., 2021). Furthermore, the use of herbs may cause patients to be non-compliant with their prescribed medicine. This may hinder the efforts of both patient and physician to manage hypertension and impact the patient's health-related quality of life in a negative way.

1.2 Significance of Study

Malaysia is blessed with an array of natural resources and tropical forests due to its ideal geographical location. With around 23,00 documented

herbs, Malaysia can be considered among the major bio-diverse countries in the world (Hashim et al., 2016). Despite this fact, scarce amount of information exists on the practices of herbs use by patients to manage a certain disease or condition such as hypertension. Certain forms of CAM modalities have been shown to have antihypertensive properties but proven scientific evidence on the effectiveness of other CAM such as crude herbs are still lacking (Mateti and Vooradi, 2016). Globally and in Malaysia, researchers have examined the use of CAM in general to manage hypertension among patients, but not much focus was given to crude herbs. Furthermore, investigations on patients' practice of using crude herbs with conventional medicine for chronic disease management were still lacking. This is despite crude herbs use being widespread and instilled in cultural practices of Malaysians.

Previous studies have also recommended that more studies in different settings should be conducted on the use of alternative therapies to treat hypertension as the use of nonconventional treatments was notable in numerous developed and developing countries. Hence, this study employs a quantitative and qualitative approach to evaluate the self-management practices involving the usage of crude herbs among adult hypertension patients in Malaysia and its impact on the patient's health-related quality of life. The findings of this study would help researchers and healthcare staff to improve communication on crude herbs use for hypertension with patients. Furthermore, the diversity of crude herbs used by patients while on hypertension treatment would pave the way for future studies on the effectiveness of concurrent use on blood pressure control.

In addition, identifying the perception of patients on their use could help in developing education programmes based on patients' needs regarding crude herbs use in hypertension management.

1.3 Research Objectives

This study was performed with the following objectives:

- To determine the prevalence, predictors and perception of crude herbs usage in managing hypertension among primary care outpatients.
- To identify the diversity of crude herbs being integrated in managing hypertension.
- To compare the health-related quality of life of hypertension patients who are taking crude herbs and who are not taking crude herbs.

CHAPTER 2

LITERATURE REVIEW

2.1 Hypertension

2.1.1 Overview of Hypertension

Hypertension, or raised blood pressure is whereby persistent increased blood pressure occurs in blood vessels (WHO, 2019). Hypertension may result from an low physical activity, unhealthy diet, high consumption of alcohol, tobacco use and family history of hypertension (CDC, 2019). Based on the clinical practice guidelines (CPG) by the Ministry of Health Malaysia, hypertension is when the systolic blood pressure (SBP) is equal or greater than 140 mmHg and/or diastolic blood pressure (DBP) is equal or greater than 90 mmHg (CPG, 2018). The classification of hypertension based on the CPG 2018 is presented in Table 2.1.

Table 2.1: Blood Pressure Levels Classification (adapted from CPG, 2018)

Classification	Systolic Blood Pressure (mmHg)		Diastolic Blood Pressure (mmHg)
Optimal	<120	and	<80
Normal	120-129	and/or	80-84
At Risk	130-139	and/or	85-89

Continued Table 2.1: **Blood Pressure Levels Classification in Adults**

Classification	Systolic Blood Pressure (mmHg)		Diastolic Blood Pressure (mmHg)
Hypertension			
Stage 1 (Mild)	140-159	and/or	90-99
Stage 2 (Moderate)	160-179	and/or	100-109
Stage 3 (Severe)	≥180	and/or	≥110

2.1.2 Prevalence and Impact of Hypertension

According to CDC, 75 million people living in the United States presented with high blood pressure which equals to around one of three adults (Merai et al., 2016). In terms of prevalence of hypertension, there was an increase in prevalence of hypertension with age and this disease was more prevalent in rural areas based on the NHMS studies performed in 2006, 2011 and 2015 (CPG, 2018). In 2019, the prevalence of hypertension among adults in Malaysia stood at 30% indicating the three in 10 adults were hypertensive patients (NHMS, 2019). Hypertension is the most prominent risk factor for cardiovascular conditions (Kjeldsen, 2018). According to the World Health Organization, 74% of deaths in Malaysia were attributed to non-communicable diseases and out of that, 35% of mortalities were due to cardiovascular diseases (WHO, 2018). Hypertension is dubbed as a “silent killer” as patients normally show no noticeable symptoms (American Heart Association, 2019). Thus, the management of hypertension must take center stage to prevent severe life-

threatening health conditions such as stroke, myocardial infarction, or aortic aneurysms (NHS, 2019).

2.1.3 Management of Hypertension

The maintenance and regulation of blood pressure involves several physiological mechanisms which include, atrial natriuretic peptide, arterial baroreceptors, renin–angiotensin–aldosterone system, mineralocorticoid, glucocorticoid and endothelin. These systems regulate the systemic circulation through sodium and water content regulation, vasodilation and vasoconstriction. A dysfunction in these processes may lead to hypertension (Clinical Pharmacist, 2015). The management of hypertension involves interventions which target these systems to maintain a normal systolic and diastolic blood pressure.

Currently the health care professionals manage hypertension using various methods which are combination of both conventional and non-conventional were being practiced for hypertension management. As for conventional therapy, classes of drugs like beta blockers, angiotensin converting enzyme (ACE) inhibitors, alpha blockers, thiazides and calcium channel blockers are frequently prescribed to patients with hypertension to lower their blood pressure (Wright, Musini and Gill, 2018). Guidelines on hypertension management like the 2017 ACC/AHA guidelines also exist to highlight the evaluation, detection, treatment and prevention of increased blood pressure among adults (Carey, 2018).

Besides the use of conventional medicine, several non-conventional therapies can function as adjunctive treatment to assist in maximizing therapeutic efficacy of hypertension management. Alterations in diet such as reduced sodium chloride intake and additional physical activity leading to weight loss were shown to manage hypertension effectively (Medscape, 2019). Interestingly, CAM therapies to control hypertension have also garnered the attention of patients leading to a rise in its usage (Osamor and Owumi, 2010; Mateti and Vooradi, 2016; Asfaw Erku and Basazn Mekuria, 2016; Lulebo et al., 2017). However, not all forms of CAM treatments have their effectiveness in managing hypertension proven by scientific research. Hence, the usage of CAM in the management of hypertension must be further examined.

2.2 Complementary and Alternative Medicine (CAM) for Hypertension

2.2.1 Types of CAM

The term Complementary and Alternative Medicine (CAM) refers to a collection of diverse healthcare and medical products, systems and practices which do not come under the category of conventional Western medications (Ching et al., 2013). The National Center for Complementary and Integrative Health (NCCIH) divided complementary health interventions into two groups; natural products and mind and body practices (NCCIH, 2019). Mind and body practices comprises of a diverse and large group of techniques or procedures taught or administered by a teacher or a trained practitioner. These techniques

encompass meditation, yoga and chiropractic and osteopathic manipulation. Natural products on the other hand, consists of a diversity of products namely probiotics, vitamins and mineral and herbs (NCCIH, 2019; Patterson and Arthur, 2009; Siti et al., 2009; Ali-Shtayeh et al., 2013). Saeed et al. (2018) presented the types of CAM is five different categories based on the classification by National Center for Complementary and Alternative Medicine (NCCAM) as indicated in Table 2.2.

Table 2.2: Classifications of CAM Therapies (adapted from Saeed, et al., 2018)

Classifications	CAM therapies
Biological based therapies	• Herbs and other botanicals, minerals, amino acids, substances like organ tissues, enzymes and metabolites, vitamins, and dietary supplements
Alternative medical systems	• Naturopathic medicine • Ayurvedic medicine • Homeopathic medicine • Traditional Chinese medicine
Body based and manipulative methods	• Massage • Chiropractic • Osteopathic
Energy therapies	Reiki, pulse fields, therapeutic touch, magnetic fields, qigong
Mind-body interventions	Mental healing, meditation, prayer and creative outlets like music, dance or art.

In Malaysia, the ministry of health traditional and complementary medicine division recognizes seven fields which include traditional Malay medicine, chiropractice, homeopathy, traditional Indian medicine, traditional Chinese medicine and osteopathy (Ministry of Health Malaysia, 2021).

2.2.2 Integrative Health

According to the National Centre for Complementary and Integrative health, complementary medicine is defined as a non-mainstream practive which is used in tandem with conventional therapies. On the other hand, integrative Health is the approach of bringing CAM together with conventional medicine in a coordinated manner (Ng et al., 2022).

2.2.3 CAM used for The Management of Hypertension

As hypertension may not be managed adequately by conventional prescribed medicines in certain cases, researchers have begun to focus their studies on several CAM therapies (Kretzer, 2011). There is evidence which highlight that mind-body practice such as Yoga is effective in controlling blood pressure due to relaxation which reduces stress by disrupting the fight-or-flight stress response (McCaffrey et al., 2005). Furthermore, level 1 evidence for the utilization of Qigong, slow breathing techniques, meditation and dark chocolate in hypertension management exists. Qigong, slow breathing techniques and meditation helped reduce the activity of sympathetic nervous system while dark chocolate improved endothelial function. A systematic review by Nahas (2008), concluded that the use of these interventions for hypertension can be considered for patients interested in CAM modalities. Although several CAM therapies have significant benefits when it comes to hypertension management, more evidence are needed to justify the patient's use of CAM to ensure the maintenance of their well-being and health (Mateti and Vooradi, 2016).

2.2.4 Crude Herbs in Hypertension Management

Crude herbs is a type of CAM modality under the category of biological-based therapies. It is defined as the raw plant, before it is processed or dried (Saeed et al., 2018). Crude herbs could be taken raw, or minimally processed in the form of infusion or blanching. Herbs that were cooked, extracted, or finished product in the form of pills such as herbal medicine were not classified as crude herbs. Previous laboratory-based findings have indicated that crude herb extracts possess anti-hypertensive properties.

According to Moghadam, Imenshahidi and Mohajeri (2013), extracts of celery (*Apium graveolens)* seed showed evidence of hypotensive effect due to the presence of hydrophobic constituents. In addition, Chinese Hawthorn (*Crataegus pinnatifida*) has been utilized as a decoction for hypertension treatment in China with studies showing the presence of oligomeric procyanidins and flavonoids, both potent antioxidants which have advantageous effects on the heart (Tabassum and Ahmad, 2011). A study by Ried and Fakler (2014), also pointed out that garlic (*Allium sativum*) extracts may lower blood pressure as polysulfides in garlic can upregulate H_2S production to promote vasodilation.

Despite the potential benefits of certain crude herbs in reducing blood pressure being proven by laboratory studies, limited evidence on the potential side effects, toxicities and interactions with conventional medicine makes the

effectiveness of using crude herbs in the management of hypertension are still ambiguous and unclear. NCCIH provides multiple brief fact sheets on their website and mobile application (HerbList) regarding the background, uses and safety of several plants such as aloe vera, bitter orange and ginkgo (NCCIH, 2019). However, the information provided is limited and does not include numerous other herbs being used by hypertension patients. Even so, patients are still adamant on taking crude herbs to lower their blood pressure which could potentially act as a double edge sword in the scheme of hypertension management. Hence, it is imperative that population-based studies be conducted to shed light on the various crude herbs being used among hypertension patients.

2.3 Health Related Quality of Life (HRQOL) and Hypertension

2.3.1 Overview of Health-Related Quality of Life (HRQOL)

The World Health Organization described quality of life as the perception of an individual on their life position with regards to culture and value systems they live in and relation to their concerns, expectations, standards and goals. This concept is affected by the person's physiological state, social relationships, physical health, their relationship to salient environmental features and personal beliefs (WHO, 2019).

Recently, health-related quality of life (HRQOL) in clinical and health research is becoming an emerging concept (Xu et al., 2016; Nurhayati and Widowati, 2016). In addition, HRQOL may function as an indicator to assess

treatment outcomes for hypertension, thus making it an important outcome in studies linked to hypertension (Khaw, Hassan and Latifah, 2011; Nurhayati and Widowati, 2016).

2.3.2 HRQOL of Patients Taking CAM

Based on a systematic review by Trevisol et al. (2011), hypertension patients were found to have lower quality of life measures when compared with non-hypertensive individuals. This may be due to certain adverse effects of antihypertensive drugs or the severity of the disease (Cavalcante et al., 2017). Therefore, patients with hypertension would seek for alternative treatment methods or self-medication in order to improve their depreciating quality of life. There has been limited evidence on the effect of crude herbs use on health-related quality of life. However, certain studies have shown that some complementary therapies have positive effects on both blood pressure and the quality of life of individuals.

Researchers found that a short yoga program for home practice among patients had a positive impact on self-rated quality of life and aided reduction of blood pressure (Priya et al., 2017). However, another study showed that hypertension patients consuming products based on herbs were found to possess less or middle levels of quality of life compared to good quality of life (Nurhayati and Widowati, 2016). It is essential that a proper treatment regime which can maintain the quality of life of patients should be recommended more regularly

(Khaw, Hassan and Latifah, 2011). Hence, in this study, it would be interesting to examine the quality of life of patients on two different treatment methods which are those only on conventional medicine and those taking conventional medicine with crude herbs.

2.4 Systematic Review

A systematic review on population-based studies regarding herbs use to manage hypertension among patients who attended healthcare facilities was performed to gather and analyse findings from previous literature. The methodology of the systematic review would be described in Chapter 3 while the findings and implications would be elaborated below.

2.4.1 Characteristics of Included Studies

The study characteristics were detailed in Appendix A (Table A.1). 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.

2.4.2 Prevalence and Diversity of Herbs Used

Thirteen studies reported the overall prevalence of herbs usage by hypertension patients in their studies and this ranged from 6.5% to 69.0% as indicated in Figure 2 (Mahfudz and Chan, 2005; Tajadini et al., 2013; Bahar et al., 2013; Amira and Okubadejo, 2007; Olisa and Oyelola, 2009; Ali-Shtayeh et al., 2013; Gohar et al., 2008; Hu et al., 2013; James et al., 2018; Kretchy, Owusu-Daaku and Danquah, 2014; Peltzer, 2004; Peltzer and Pengpid, 2019; Wazaify et al., 2013). Three studies only reported the prevalence of individual herbs used as shown in Table 2.3.

For the types of herbs, the five main herbs with the highest frequency of use reported from each study were presented in Table 2.3. The most common herb reported was *Allium sativum,* commonly known as garlic which was reported in nine studies (Ching et al., 2013; Tajadini et al., 2013; Akansel et al., 2007; Bahar et al., 2013; Amira and Okubadejo, 2007; Olisa and Oyelola, 2009; Ali-Shtayeh et al., 2013; James et al., 2018; Kretchy, Owusu-Daaku and Danquah, 2014). The second most reported herb used by patients with hypentension was *Vernonia amygdalina* or bitter leaves which were mentioned in four studies (Amira and Okubadejo, 2007; Olisa and Oyelola, 2009; James et al., 2018; Kretchy, Owusu-Daaku and Danquah, 2014). 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 europeea*) (Ali-Shtayeh et al., 2013). 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) (Bahar et al., 2013). The third study reported that most herbs were self-prepared (*Azadirachta indica* and *Allium sativa*) (Olisa and Oyelola, 2009).

Table 2.3. 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

Continued Table 2.3. 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 (%)
Ali-shtayeh, et al., 2013	62.1% used herbs	*Allium sativum*, garlic	33.1
		Hibiscus sabdariffa, roselle	17.6
		Olea europaea, olives	16.7
		Crataegus aronia. hawthorn	12.9
		Anisum vulgarea, anise	9.4
Amira and Okubadejo, 2007	37.8% used herbs and dietary supplements	*Allium sativum*, garlic	69.3
		Native herbs	25
		Ginger	23.9
		Vernonia amygdolina, 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
		Moringa oleifera	30
		Garlic	27.3
		Bitter leaf	3.7
		Lemon grass	1.1

Continued Table 2.3. 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 (%)
Kretchy, Owusu-Daaku and Danquah, 2014	12.8% used biological based therapies (herbs)	Herbal mixtures	17.65
		Bitter leaves + dandylion + moringa	13.73
		Garlic + dandylion	11.76
		Garlic	9.8
		Danylion + moringa	9.8
Mahfudz and Chan, 2005	15.3% used herbal medicine	*Morinda citrifolia*, mengkudu	NR
		Centella asiatica, pegaga	
		Andrographic paniculata, hempedu bumi	
		Carica papaya, papaya	
		Boswellia serrata, arthrid	
Olisa and Oyelola, 2009	25% used herbal medicine	*Azadirachta indica*	12.5
		Allium sativa	9.62
		Aloe vera	7.69
		Tamrindus indica	7.69
		Hyenia thebacia	7.69
Peltzer, 2004	26% used herbs	NR	
Peltzer and Pengpid, 2019	32% used herbal medicine	*Carthamus tinctorius*	NR
Ching, et al., 2013	NR	Bitter gourd	34.4
		Garlic	17
		Misai kucing	14.6
		Ular hempedu	8.5
		Basil leaf	1.7

Continued Table 2.3. 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 (%)
Tajadini, 2015	29.4% used herbal medicine	Green tea	49.1
		Althaea officinalis	35.6
		Carthamus tinctorius	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	*Hibiscus sabdariffa*, roselle	NR
		Zingiber officinale, ginger	
		Olea europaea	
		Crataegus aronia	
		Cinnamomum zeylanicum	

*NR: Not reported

2.4.3 Reasons and Associated Factor for Herbs Use

The reasons of herbs usage and its associated factors among hypertension patients were extracted and detailed in Table 2.4. 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 (Ali-Shtayeh et al., 2013). A second study also mentioned age ($p=0.05$) as an associated factor (Olisa and Oyelola, 2009). Gender ($p=0.005$) also showed significant association with herbs use in one of the studies (Tajadini et al., 2013) while education level ($p<0.01$) was a significant factor in another study (Mahfudz and Chan, 2005).

Table 2.4. Reasons and associated factors for using herbs.

Secondary Outcomes	Findings	Main Author, Year
Reasons for using herbs	- relieve symptoms of disease (48.9%) - slow down progression of disease (37.6%) - cure of disease (31.5%) - reduce side effects of medication (13.1%)	Ali-Shtayeh, 2013
	- perception on the failure of allopathic medicine (31.73%) - allopathic medicine's high cost (23.08%) - cultural practices/herbal knowledge (20.19%) - poor accessibility to health care services (19.23%) - safety concerns about allopathic medicines (9.62%)	Olisa, 2009
	- to decrease blood pressure (93.8%) - as adjuvant therapy (88.3%) - for diabetes (21.6%)	Tajadini, 2015

Continued Table 2.4. Reasons and associated factors for using herbs.

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)	Ali-Shtayeh , 2013
	- 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

2.4.4 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%) (Ali-Shtayeh et al., 2013), friends or neighbours (63.5%) (Bahar et al., 2013), traditional medicine practitioner (70.4%) (James et al., 2018), and family members and friends (41.5%) (Tajadini et al., 2013). 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 (James et al., 2018). 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 (Olisa and Oyelola, 2009) Three studies which reported the disclosure of herbs use for hypertension indicated that 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% (Olisa and Oyelola, 2009; Ali-Shtayeh et al., 2013; James et al., 2018).

2.4.5 Implications of Findings from Systematic Review

This systematic review is the first to focus on the prevalence and diversity of herbs used among outpatients with hypertension attending 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 (Harris et al., 2012; Bishop et al., 2010). 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 et al. (2012), reported that 22% to 68% of cardiovascular disease patients used biological based therapies. The attributions for wide range in the prevalence were due to different definitions of herbs (Ali-Shtayeh et al., 2013; James et al., 2018) varied culture and socio-economic background of patients across developed and developing countries, and diversity of herbs across temperate and tropical countries. 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 use with their prescribed medications.

Patients with hypertension who are attending outpatient clinics or hospitals do choose to use herbs to manage hypertension. These patients are likely taking antihypertensive drugs in conjunction with herbs which put them at risk towards unwanted herb-drug interactions (Hu et al., 2005). Previous investigations have shown that grapefruit juice may increase calcium channel blockers in the blood which could aggravate hypertension, or cause liver toxicity (Tachjian, Maria and Jahangir, 2010). Despite this, patients perceived that taking antihypertensive drugs alone is not helping them with their chronic disease. Moreover, many patients were prolonged on medication because of their unmanaged high blood pressure and prefer to take herbs as a result. 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 (Xiong et al., 2015; Ch'ng et al., 2017; Onyema-iloh et al., 2018). 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 (Driscoll et al., 2019). These studies highlight experimental and cultural influences over herbs use 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 (Bahar et al., 2013; Olisa and Oyelola, 2009; Ali-Shtayeh et al., 2013). Different preparation methods such as boiling, frying or steaming may increase or decrease phytochemical contents of the herbs (Gunathilake, Ranaweera and Rupasinghe, 2018) In addition, studies showed 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 (Skibola and Smith, 2000). 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 (Olisa and Oyelola, 2009) Therefore, patients should be advised against substituting drugs with herbs or taking both concomitantly as their safety and efficacy has yet to be proven (Isari et al., 2019). It was 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. Patients indeed 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.

In a nutshell, this review found that the use of herbs as one of the main modalities of CAM among patients with hypertension who were 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. 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.

CHAPTER 3

METHODOLOGY

3.1 Outline of Methodology and Conceptual Framework

This study was performed in three phases; Phase I (Systematic Review), Phase 2 (Quantitative Study and Qualitative Study). Ethical approval was obtained from the Medical Research and Ethics Committee (NMRR), UTAR scientific and Ethical Review Committee (SERC) and Klinik Kesihatan Kampar (KK Kampar). A conceptual framework was created from previous literature and the current research hypothesis as depicted in Figure 3.1.

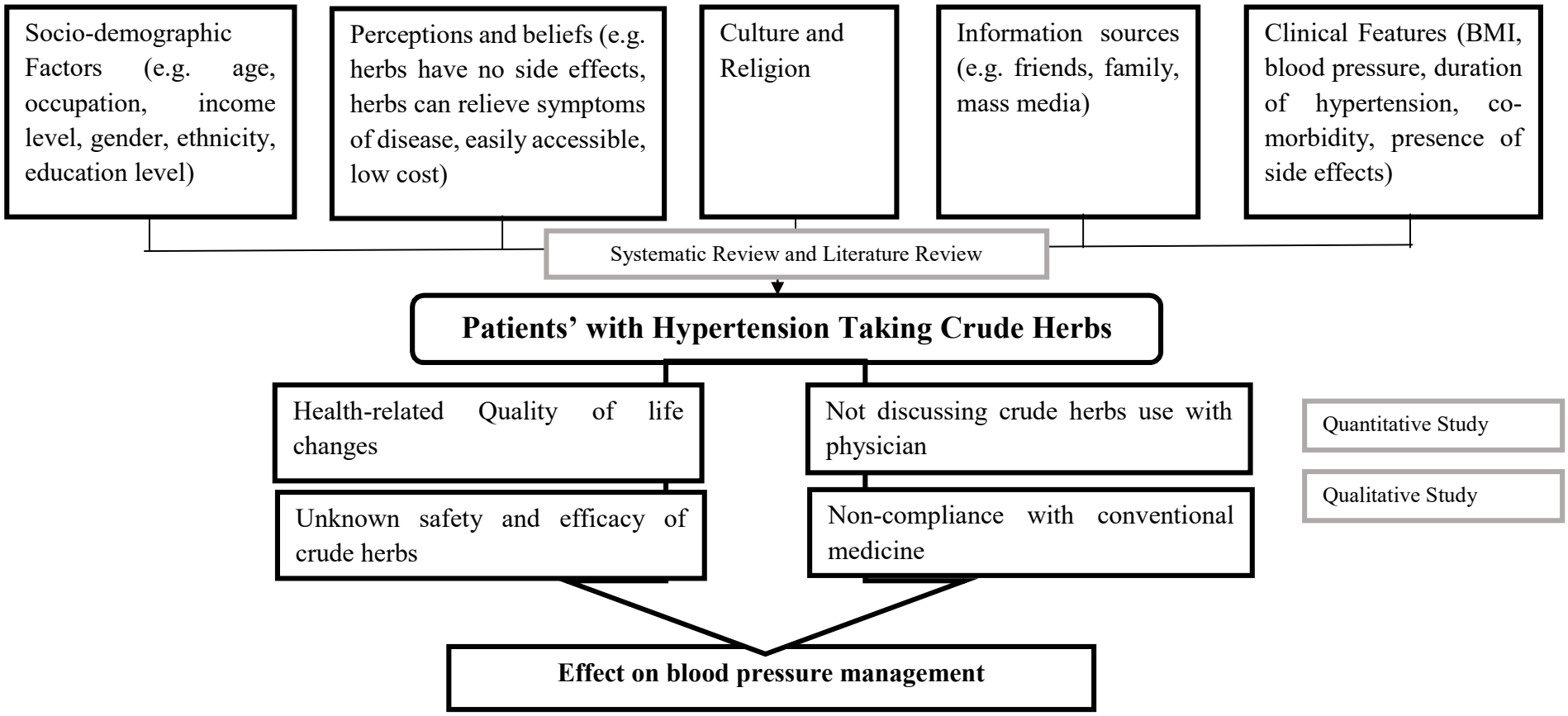

Figure 3.1: Conceptual Framework for this study

3.2 Systematic Review

3.2.1 Protocol and Registration

This was a systematic review reporting the prevalence of herbs used in patients with hypertension. The descriptive approach used for the articles was cross-sectional studies performed in a healthcare facility. The studies would report the prevalence, types of herbs used, reasons for use and side effects experienced by the patients. This review was conducted based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement (Moher, et al., 2009). The review protocol was registered under PROSPERO (ID: CRD42020142139) as detailed in Appendix D.

3.2.2 Eligibility Criteria

Cross-sectional studies that reported the prevalence of herbs used among patients with hypertension attending hospitals or clinics were included in this review. 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, systematic reviews, meta-analyses, conference proceedings, and non-English were excluded.

3.2.3 Information Sources and Search Strategy

The literature review was conducted using 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 Appendix B (Table A.2). 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.

3.2.4 Study Selection and Quality Assessment

The references extracted from the databases were screened in terms of title and abstract by two researchers. Any disagreement on the inclusion would be reviewed by the third researcher and resolved on discrepancy. Subsequently,

the same process was employed in the full text assessment to decide whether the articles can be included in this review.

The selected studies were assessed using AXIS (Appraisal 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 (Downes et al., 2006). The AXIS functions to cumulatively assess individual characteristics of a study and does not use a numerical scale to create a score for quality assessment (Wong, McAuley and Trinth, 2018). This tool was pilot tested 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 Appendix C (Table A.3). The assessment was performed independently by two different reviewers' and discrepancies were solved by consensus with a third reviewer.

3.2.5 Data extraction

Data extraction was done 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.

3.2.6 Data 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 conducted as there was high heterogeneity of the included studies.

3.2.7 Article Yield

A total of 5810 articles were extracted from the five databases and nine additional articles were identified from reference mining and expert recommendation (Figure 3.2). 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.

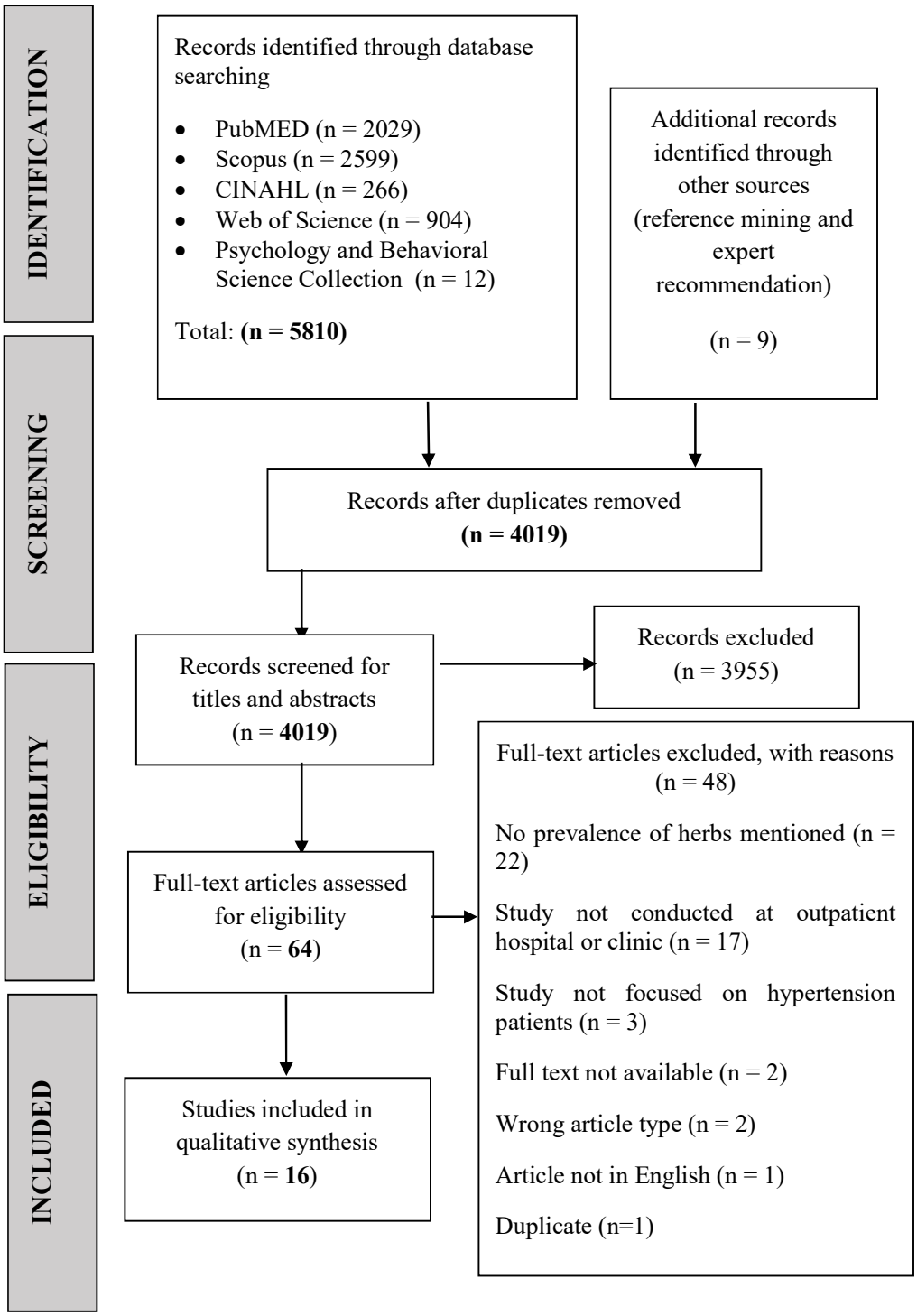

Figure 3.2. Prisma Framework

3.3 Quantitative Survey

3.3.1 Study Site

Phase 2 of this research was performed in KK Kampar, which is a primary health clinic situated in the Kampar district. This clinic is one of the four government primary care clinics in the Kampar district with the other three being Klinik Kesihatan Malim Nawar, Klinik Kesihatan Gopeng and Klinik Kesihatan Kota Bharu (Jabatan Kesihatan Negeri Perak, 2014). KK Kampar is situated in Kampung Baharin Pinji, which is a strategic location as people from different towns such as Kampar and Mambang Diawan may attend this clinic for routine medical checks, follow-ups and treatment.

3.3.2 Study Population

Patients attending KK Kampar were recruited to take part in the study based on the set inclusion criteria. The inclusion criteria was; diagnosed with hypertension by a KK Kampar physician, adults 18 years or older and attended at least three appointments for treatment of hypertension at the clinic. The exclusion criteria for this study were patients who could not communicate in either English or Bahasa Malaysia and mentally disabled or physically impaired. These patients were excluded because it would be difficult for them to understand and complete the questionnaire which may lead to poor quality data.

3.3.3 Study Design

This study used a cross-sectional survey method, which is a type of observational study to measure exposures and outcomes of study subjects at a given time (Setia, 2016). A descriptive comparative design was employed to compare the relationships the outcome and the predictor variables. Study participants will be compared based on the use and non-usage of crude herbs for hypertension. Comparisons among these two groups of participants will be made against health-related quality of life domains.

3.3.4 Sample Size Calculation

The Cochran formula was used to obtain the sample size required. It was calculated based on a previous study conducted in an Ipoh government health clinic situated near the study site whereby the prevalence of crude herbs use stood at 15.3% (Mahfudz and Chan, 2005). A sample size of 311 was obtained after considering a margin of error of 4% and a 95% confidence level.

Sample size = $Z^2p(1-p) / e^2$

where,

Z^2 is 1.96 for 95% confidence interval, p is the prevalence of herbs used from an earlier study (15.3%) and e is the margin of error (4%)

Therefore, 1.96

Sample size $= [(1.96)^2(0.153)\ (1-0.153)] / (0.04)^2$

$= 311$

3.3.5 Data Collection Tool

A semi-structured questionnaire was developed and was the desired data collection tool utilized in this study. A semi-structured questionnaire consists of close-ended questions whereby the participants will choose an answer based on the available options given and open-ended questions which allows participants to give their views and opinions based on the question. The questionnaire composed of eight sections; Section A (Socio-demographic Characteristics), Section B (Disease Details and Hypertension Management), Section C (Lifestyle Changes for Hypertension Management), Section D (Participants' Medical History), Section E (36-Item Short Form Survey Instrument (SF-36)), Section F (International Complementary and Alternative Medicine (I-CAM-Q) adapted for studies among Malaysian Hypertension Patients), Section G (Crude herbs used by Hypertension Patients) and Section H (BMI and Blood Pressure Measurements). This comprehensive questionnaire had self-design questions, and internationally validated questionnaires (SF-36 and I-CAM-Q).

The Short Form-36 (SF-36) is a health-related quality of life questionnaire health survey is commonly employed to evaluate health related

quality of life (HRQOL) (Ware and Sherbourne, 1992). This self-administered questionnaire which has 36 questions, comprises of nine health concepts which includes general health perception, bodily pain, energy or fatigue, physical functioning, role limitations due to physical health issues, role limitations due to emotional or personal problems, emotional well-being and social functioning. of 36 questions and explores (Aydemir, Ozdemir and Koroglu, 2005). The version of SF-36 used in this study included its scoring system was developed by the RAND Corporation (RAND, 2019). This version is readily available at their website and can be used without a license. The SF36 was previous validated in Malaysia and deemed suitable to be used among Malaysian clinical patients (Sararaks et al., 2005)

The International Complementary and Alternative Medicine Questionnaire (I-CAM-Q) was designed by a group of CAM practitioners and researchers attending an international workshop organized by National Research Center in Complementary and Alternative Medicine (NAFKAM). This questionnaire was designed so that a standard method of determining the use of CAM could be used among various study settings and populations. The I-CAM-Q consisted of four sections. The first section involved questions on the types of healthcare providers approached by the patients while the second section queries on the type of alternative therapies given by practicing physicians with a medical degree. The third and fourth section consisted of information on the utilization of dietary supplements and herbal medicine and self-help practices applied by the respondents respectively (Quandt et al., 2009). Since its development, this

questionnaire has been culturally adapted to be used in various study settings such as Cambodia, Japan and Germany (Shumer et al., 2014; Pearson et al., 2018; Re, Schimdt and Guthlin, 2012).

For this study, the I-CAM-Q was adapted for use among Malaysian participants with hypertension. The types of complementary therapies, health care providers and self-care providers were adapted to the Malaysia's culture and health care practices. The adapted I-CAM-Q was then reviewed by two experts in the complementary and alternative medicine field and deemed suitable for use in a Malaysian setting.

The completed questionnaire was reviewed by a research team. The reviewed questionnaire was then translated to Bahasa Melayu (BM) and was evaluated by an expert in the language, a secondary school BM teacher. Any recommendations by the expert were noted down and relevant changes were made to the translated questionnaire. The BM translated questionnaire was then compared with the English questionnaire to ensure no meaning was changed during the translation process. The questionnaire was pilot tested among 10 patients with hypertension who attended KK Kampar for appointments and feedback on the questionnaire was recorded. The final questionnaire for both English and Malay language was attached in Appendix E.

3.3.6 Sampling and Selection of Participants

The convenience sampling technique was employed for this survey. The general practitioners in charge of the primary care clinics were briefed about the participant selection procedure, which included the inclusion and exclusion criteria. Patients who fulfilled the set criteria would be recommended to take part in the survey by the doctors. The doctor would then complete a form regarding the complications faced by each of the patients and pass it to the researcher.

3.3.7 Data Collection Method

Prior to answering the questionnaire, participants would have to fill in a consent for and have their anthropometric measurements (blood pressure, height, weight) taken. A face-to-face interview is then performed to assist the participants to complete the semi-structured questionnaire. A pilot study which included 10 participants was conducted in the beginning of the survey. This was to ensure the questionnaire was suitable and of high-quality allowing data collection to proceed effectively.

3.3.8 Ethical Approval

Ethical approval from Klinik Kesihatan Kampar (Appendix F), Universiti Tunku Abdul Rahman Scientific and Ethical Review Committee (U/SERC/207/2019) (Appendix G) and National Medical Research Register (NMRR-17-2591-38273) (Appendix H) was obtained for this study.

3.3.9 Data Analysis

The data obtained from the survey was analysed using SPSS version 25. The collected data was first keyed into SPSS version 25, cleaned and then processed prior to data analysis. The means, standard deviation, percentages and frequency were presented as part of the descriptive statistics. The association between patients socio-demography, medical history, lifestyle modifications and basic measurements and their crude herbs use practice were determined using the Chi-square test. Due to limited samples for 'others' group, the association between crude herbs use and race was studied using the Fishers exact test. The multiple logistic regression analysis was done to find the predictors of crude herbs use among the patients with hypertension. The impact of the factors including monthly income, education level, systolic blood pressure, falls and comorbidities were compared across gender and race groups to identify possible groups with higher usage. Interaction effect of race and gender was also studied. The distribution for HRQOL domains among users of crude herbs and the non-users were compared used the Mann-Whitney U test. A p-value of less that 0.05 was set as the critical value for statistical significance.

3.4 Qualitative Study

3.4.1 Participants for In-depth Interviews (IDI)

In-depth interviews (IDI) were performed to explore the reasons behind use of herbs by patients with hypertension and their perspective on the effectiveness of herbs in managing high blood pressure. In addition, participants were encouraged to share their self-management practices using herbs. During the interviews, the participants were encouraged to elaborate on issues related to the research objectives through open-ended questions. The qualitative study was done among herb users who were patients diagnosed with hypertension and had attended a primary care facility for at least three prior appointments. Purposive sampling was employed to obtain hypertension patient's who have taken crude herbs with conventional medication and were of Malay or Indian ethnic groups. Sampling was also carried out based on the results obtained from the quantitative study. The participants were required to fill in a consent form and socio-demographic information. Ethical approval was obtained from Universiti Tunku Abdul Rahman.

3.4.2 Interview Guide

Using the findings from systematic review, quantitative study and opinion from experts, a semi-structured interview guide was created for the interviews. This guide contained the objectives of the qualitative study and questions that would answer the objectives. The guide was then translated to

Bahasa Melayu by an expert and reviewed by the research team. The interview guide was detailed in Appendix I (Table A.7).

3.4.3 IDI Data Collection

The interviews were performed from January 2021 to August 2021. The interviews were conducted either face-to-face, through telephone call or WhatsApp messaging depending on the availability of the participant. The duration of IDIs were 20 to 30 minutes and was conducted by at least two researchers. The interviewer would frequently probe the participants for extra information using the interview guide as a reference to allow participants to further express their views and ideas. The interviews were conducted in two languages; English and Bahasa Melayu and was recorded using a smartphone. The interviews were stopped once data saturation had been achieved.

3.4.4 Transcribing Interviews

The interview recordings were transfer and stored in a personal computer and were played back using VLC media player. The recordings were then transcribed verbatim and crosschecked among researchers to assure the quality and accuracy. Transcripts were exported to QDA Miner lite which is an easy-to-use software developed by Provalis Research for qualitative data analysis. It is used for coding, organizing, annotating, analyzing and retrieving collections of images and documents (Provalis Research, 2022). The transcripts were then analysed using a thematic approach. For the transcripts in Bahasa Melayu, they

were analysed and selected quotes were translated to English and checked by a native speaker for accuracy.

3.4.5 Qualitative Data Analysis

Data was analyzed after several interviews before the researchers proceeded to the subsequent transcripts. Each transcript was first read independently by two researchers to understand and outline an overall framework. Codes were then assigned to phrases, sentences or paragraphs which conveyed a certain meaning. Parts of the transcripts with similar meaning were assigned the same code while parts with new meaning were assigned with a new code. Any discrepancies in coding between researchers were resolved through consensus. The codes were assigned until no new codes emerged. The codes were then grouped into themes. Data from the systematic review, quantitative study and qualitative study was then triangulated regarding of self-management using crude herbs among adult patients with hypertension (Loganathan et al., 2015).

CHAPTER 4

RESULTS

4.1 Prevalence, Socio-demographic Details and Basic Measurements

A total of 306 patients were approached of which, and 294 participants were successfully recruited into this cross-sectional study. This amounted to a 94.5% response rate estimated as the number of responses obtained over calculated sample size. The main reason for not participating given by patients was lack of time. The prevalence of patients with hypertension using crude herbs was 30.6% (n=90). This means that 30.6% of participants chose to complement crude herbs with their current treatment received from KK Kampar. The most frequent age group was 60 to 69 age category (n=114, 38.8%). Mostly were Malay (n=122, 41.5%), and Chinese (n=115, 39.1%). Majority of the respondents had no monthly income (n=178, 60.5%), and while most obtained secondary education and higher (n=151, 51.4%). About 114 (38.8%) patients were housewives, while 101 (34.4%) were retired. Over half of the patients had hypertension for at least 5 years (n=165, 56.1%) while 117 (39.8%) patients presented with uncontrolled hypertension (systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg). Most patients had normal or underweight body mass index (n=125, 42.5%) (Table 4.1).

Table 4.1: Sociodemographic details and basic measurements of patients

Variables	Total (n=294)		Taking crude herbs				Chi-square (χ^2); *p*-value
			Yes (n=90)		No (n=204)		
	n	%	n	%	n	%	
Age groups							
<60	101	34.4	38	37.6	63	62.4	3.561; 0.059
≥60	193	63.6	52	26.9	141	73.1	
Gender							
Male	140	47.6	34	24.3	106	75.7	5.036; 0.025*
Female	154	52.4	56	36.4	98	63.6	
Race							
Malay	122	41.5	59	48.4	63	51.6	49.963; 0.000*[a]
Chinese	115	39.1	10	8.7	105	91.3	
Indian	48	16.3	17	35.4	31	64.6	
Others	9	3.1	4	44.4	5	55.6	
Monthly Income							
No income	178	60.5	43	24.2	135	75.8	8.876; 0.012*
<RM 3000	98	33.3	40	40.8	58	59.2	
>RM 3000	18	6.1	7	38.9	11	61.1	
Education level							
No formal education	37	12.6	11	29.7	26	70.3	11.985;
Primary education	106	36.1	20	18.9	86	81.1	0.002*
Secondary education or higher	151	51.4	59	39.1	92	60.9	
Employment status							
Working Full time	58	19.7	19	32.8	39	67.2	3.588; 0.309
Working Part time	19	6.5	6	31.6	13	68.4	
Housewife	116	39.5	40	35.1	74	64.9	

Unemployed	2	0.7	1	50	1	50
Retired	101	34.4	24	23.8	77	76.2

Continued Table 4.1: Sociodemographic details and basic measurements of patients

Variables	**Total (n=294)**		**Taking crude herbs**				**Chi-square (χ^2); *p*-value**
			Yes (n=90)		**No (n=204)**		
	n	%	n	%	n	%	
Systolic Blood Pressure							
<140 mmHg	185	62.9	47	25.4	138	74.6	6.369; 0.012*
≥140 mmHg	109	37.0	43	39.4	66	60.6	
Diastolic Blood Pressure							
<80 mmHg	147	50.0	39	26.5	108	73.5	2.320; 0.314
80 – 89 mmHg	100	34.0	35	35.0	65	65.0	
≥90 mmHg	47	16.0	16	34.0	31	66.0	
Body Mass Index							
< 24.9 kg/m^2	125	42.5	37	29.6	88	70.4	3.835; 0.147
25 – 29.9 kg/m^2	101	34.4	26	25.7	75	74.3	
≥30 kg/m^2	68	23.1	27	39.7	41	60.3	

*significant association, a – Fishers exact test was used.

4.2 Lifestyle Modifications

The lifestyle modifications practice by patients attending KK Kampar were shown in Table 4.2. The three highest reported lifestyle changes included reducing sodium intake (n=168, 57.1%), healthy eating (n=123, 41.8%) and

regular physical activity (n=115, 39.1%). No statistically significant associations were noted between the use of crude herbs and lifestyle modifications practiced.

Table 4.2: Lifestyle modifications by patients

Lifestyle Modifications	Total		Taking crude herbs				Chi-square, p-value
			Yes		No		
	n	%	n	%	N	%	
Trying to reduce body weight	26	8.8	10	38.5	16	61.5	0.827, 0.363
Maintaining healthy body weight	12	4.1	5	41.7	7	58.3	-
Reduce sodium (salt) intake	168	57.1	55	32.7	113	67.3	0.834, 0.361
Reduce/stop alcohol consumption	7	2.4	3	42.9	4	57.1	-
Regular physical activity (at least 90 minutes a week)	115	39.1	41	35.7	74	64.3	2.259, 0.133
Healthy eating (as advised by doctor)	123	41.8	38	30.9	85	69.1	0.008, 0.929
Reduce/stop smoking	15	5.1	3	20.0	12	80.0	-
Stress management	4	1.4	3	75.0	1	15.0	-
Increased dietary potassium intake	10	3.4	3	30.0	7	70.0	-

*'-' indicates that Chi-square analysis was not performed due to insufficient data

4.3 Medical History

Table 4.3 outlines the participants medical history whereby the most common comorbidities reported were dyslipidemia (n=182, 61.9%), diabetes mellitus type-II (n=90, 30.6%), obesity (n=68, 23.1%), migraine (n=53, 18.0%)

and muscle pain (n=45, 15.3%). In terms of the number of comorbidities diagnosed for each participant, 47 (16.0%) had no other comorbidities, 84 (28.6%) had one comorbid, 83 (28.2%) had two comorbidities and 80 (27.2%) had three or more comorbidities. For associated factors between medical history and crude herbs use, muscle pain (χ^2=4.786, p=0.029), falls (χ^2=10.754, p=0.001) and the number of comorbidities (χ^2=13.386, p=0.004) showed a significant association. The findings suggested that patients with medical conditions such as muscle pain and falls had a higher prevalence of crude herbs use. In addition, patients who had three or more comorbidities also showed higher prevalence of using crude herbs.

Table 4.3: Medical history of patients

Medical History	**Total**		**Taking crude herbs**				**Chi-square, p-value**
			Yes		**No**		
	n	%	n	%	n	%	
Asthma	19	6.5	4	21.1	15	78.9	0.874, 0.350
Cancer	5	1.7	3	60.0	2	40.0	-
Cardiovascular disease	28	9.5	12	42.9	16	57.1	2.185 0.139
Diabetes Mellitus Type-II	90	30.6	34	37.8	56	62.2	3.135, 0.077
Dyslipidaemia	182	61.9	62	34.1	120	65.9	2.683, 0.101
Hyperuricaemia	5	1.7	4	80.0	1	20.0	-
Kidney disease	2	0.7	1	50.0	1	50.0	-
Liver disease	4	1.4	1	25.0	3	75.0	-
Migraine	53	18.0	18	34.0	35	66.0	0.342, 0.559
Muscle pain	45	15.3	20	44.4	25	55.6	4.786,

							0.029*

Continued Table 4.3: Medical history of patients

Medical History	Total		Taking crude herbs				Chi-square, p-value
			Yes		No		
	n	%	n	%	n	%	
Obesity	68	23.1	27	30.0	41	20.1	3.444, 0.063
Parkinson	1	0.3	0	0.0	1	100	-
Peptic ulcer	2	0.7	1	50.0	1	50.0	-
Stroke	4	1.4	3	75.0	1	25.0	-
Thyroid disease	2	0.7	1	50.0	1	50.0	-
Urinary tract infection	4	1.4	2	50.0	2	50.0	-
Falls	23	7.8	14	60.9	9	39.1	10.754, 0.001*
Osteoporosis	1	0.3	0	0.0	1	100	-
Number of comorbidities							
None	47	16.0	6	12.8	41	87.2	13.386, 0.004*
1	84	28.6	21	25.0	63	75.0	
2	83	28.2	31	37.3	52	62.7	
3 or more	80	27.2	32	40.0	48	60.0	

*'-' indicates that Chi-square analysis was not performed due to insufficient data

4.4 Predictors of Crude Herbs Use

The association between factors (BMI, sociodemographic details, blood pressure measurement) and the patient's use of crude herbs were determined using the chi-square test as shown in Table 4.1, 4.2 and 4.3. The associated factors determined were as follows; race (Malay and Indian and others) ($\chi 2$= 49.963, p=0.000); gender (female) ($\chi 2$=5.036, p=0.025); education level (secondary education) ($\chi 2$=11.985, p=0.002) and ($\chi 2$= 49.963, p=0.000); monthly income (no income) ($\chi 2$=8.876, p=0.012). Besides, another associated factor was systolic blood pressure ($\chi 2$=6.369, p=0.039). In terms of medical history, the number of comorbidities (χ^2=13.386, p=0.004), had falls (χ^2=10.754, p=0.001) and muscle pain (χ^2=4.786, p=0.029) were shown to be significantly associated with usage of crude herbs. However, no significant associations were identified for age groups, employment status, duration of hypertension, diastolic blood pressure and body mass index (Table 4.1).

As depicted in Table 4.4, the significant associated factors were included in multivariate logistic regression analysis to find the predictors of crude herbs usage among patients. Firstly, having muscle pains (OR: 2.227, 95% C.I.: 1.035-4.792) and experienced falls (OR: 3.011, 95% C.I.: 1.110-8.169) were noted to be predictors of crude herbs use. For race, those who were Malay (OR: 8.646, 95% C.I.: 4.011-18.637) and those who were Indian (OR: 4.433, 95% C.I.: 1.757-11.183) showed higher odds of using crude herbs as compared to patients who were Chinese. In addition, higher odds of using crude herbs were noted among the patients with secondary education or higher secondary education or

higher (OR: 2.783, 95% C.I.: 1.433-5.402) as compared with patients that have only primary education. As for systolic blood pressure readings, higher odds of taking crude herbs was identified among those who had an SBP reading or 140 mmHg or more (OR: 2.389, 95 % C.I.: 1.311-4.353) as compared with patients having a SBP reading of less than 140 mmHg.

Table 4.4: Predictors of crude herbs use

Variable	*p*-value	OR	95% C.I.	
			Lower	Upper
Falls				
Yes	0.030	3.011	1.110	8.169
No[a]				
Muscle Pain				
Yes	0.041	2.227	1.035	4.792
No[a]				
Ethnicity				
Malay	0.000	8.646	4.011	18.637
Chinese[a]				
Indian	0.002	4.433	1.757	11.183
Others	0.069	4.651	0.0886	24.415
Education level				
No formal education	0.193	1.906	0.722	5.030
Primary education[a]				
Secondary education or higher	0.002	2.783	1.433	5.402
Systolic Blood Pressure				
<140 mmHg[a]				
≥140 mmHg	0.004	2.389	1.311	4.353

[a]reference category

4.5 Interaction between factors

The impact of the factors which included monthly income, education level, systolic blood pressure, falls and comorbidities were compared across gender and race groups to identify possible groups with higher usage of herbs. Interaction effect of race and gender was also studied. The cross tabulation shown in the Appendix I (Table A.4) had highlighted the following: Herb use is higher among females, Malays and Indians, higher income group, higher education group, high systolic blood pressure, had falls and higher comorbidities. Higher use among people with high income was seen across both gender and all races. Having 3 or more comorbidities, fall and muscle pain also showed increased use in all races and both genders. However, higher use of crude herbs among higher education was only seen among women. For race, only Malays showed obvious increase in use with education. Higher use among higher systolic blood pressure was only noted among women. Men with higher systolic blood pressure did not have higher herb use. No such variation was seen across race groups. People of all races with high systolic blood pressure used herbs. Gender and race cross analysis showed that higher use among women was noted in Malays and Indian. However, in Chinese community, men used more herbs than women.

4.6 Diversity of Crude Herbs Use

4.6.1 Types of Crude Herbs, Parts and Preparation Methods Used by Patients

The prevalence of crude herbs use is 30.6% (n=90). Table 4.5 showed the number of users for each herb, preparation methods, parts, frequency of use, current use and helpfulness in managing blood pressure among the patients attending KK Kampar. This study found that users took 52 different combinations of known crude herbs. From this, twenty-one were used by three or more users. pegaga, *Centella asiatica* (n=28. 31.11%), peria, *Momordica charantia* (n=23, 25.56), betik, *Carica papaya* (n=17, 18.89%), timun, *Cucumis sativus* (n=16, 17.78%) and petai, *Parkia speciosa* (n=10, 11.11%) were the five most commonly used herbs by patients. Additionally, findings for the types of CAM practiced by patients (Table A.5) and the health complications experienced (Table A.6) was attached in Appendix J.

Table 4.5: Diversity of crude herbs used by patients

Scientific Name (Local Name of Herbs)	Number of Users (n), percentage (%)	Part of Herbs (n)	Preparation Methods (n)	Current Users of Herbs	Frequency of Use (n)	Helpful in managing blood pressure (n)
Centella asiatica (pegaga)	28, 31.11%	Leaves or shoots (26), fruits (1), blended into juice (1)	Raw (24), blended into juice (3), infusion (1)	25	Often (17), sometimes (8), rarely (3)	Helpful (17), not helpful (11)
Momordica charantia (peria)	23, 25.56%	Fruit (23)	Raw (22), Blended into juice (1)	22	Often (19), sometimes (3), rarely (1)	Helpful (12), not helpful (11)
Carica papaya (betik)	17, 18.89%	Leaves (17)	Raw (13), steamed (3), infusion (1)	16	Often (9), sometimes (7), rarely (1)	Helpful (12), not helpful (5)
Cucumis sativus (timun)	16, 17.78%	Fruit (16)	Raw (15), Blended into juice (1)	16	Often (13), Sometimes (3)	Helpful (5), Not helpful (11)
Parkia speciosa (petai)	10, 11.11%	Seeds (10)	Raw (1)	10	Often (3), Sometimes (7)	Helpful (3), not helpful (7)

Continued Table 4.5: Diversity of crude herbs used by patients

Scientific Name (Local Name of Herbs)	Number of Users (n), percentage (%)	Part of Herbs (n)	Preparation Methods (n)	Current Users of Herbs	Frequency of Use (n)	Helpful in managing blood pressure (n)
Moringa oleifera (murungai)	9, 10.00%	Leaves (8) Fruit (1)	Infusion (6) Boiled (1) Raw (1) Blended into juice (1)	9	Often (7) Sometimes (2)	Helpful (9)
Cosmos caudatus (ulam raja)	8, 8.89%	Leaves (8)	Raw (8)	8	Often (7), Sometimes (1)	Helpful (2), not helpful (6)
Momordica charantia and *Malus domestica* (peria & epal hijau)	7, 7.78%	Fruit (7)	Blended into juice (7)	7	Often (5), Sometimes (2)	Helpful (4), Not helpful (3)
Oenanthe javanica (selom)	4, 4.44%	Leaves (4)	Raw (4)	4	Often (3), Sometimes (1)	Helpful (3), not helpful (1)
Psophocarpus tetragonolobus (kacang botol)	4, 4.44%	Beans (4)	Raw (4)	4	Often (3) Sometimes (1)	Helpful (2) Not helpful (2)

Continued Table 4.5: Diversity of crude herbs used by patients

Scientific Name (Local Name of Herbs)	Number of Users (n), percentage (%)	Part of Herbs (n)	Preparation Methods (n)	Current Users of Herbs	Frequency of Use (n)	Helpful in managing blood pressure (n)
Melicope ptelefolia (tenggek burung)	4, 4.44%	Leaves or shoots (4)	Raw (4)	4	Often (4)	Helpful (3), Not helpful (1)
Anacardium occidentale (gajus)	4, 4.44%	Leaves or shoots (4)	Raw (3) Steamed (1)	4	Often (4)	Helpful (4)
Malus domestica (epal hijau)	4, 4.44%	Fruit (4)	Blended into juice (3), raw (1)	4	Often (3), Sometimes (1)	Helpful (2), Not helpful (2)
Daucus carota subsp. Sativus (lobak merah)	4, 4.44%	Fruit (4)	Blended into Juice (2), raw (2)	4	Often (1) Sometimes (3)	Helpful (1), Not helpful (3)
Apium graveolens (saderi)	3, 3.33%	Leaves or shoots (3)	Raw (1) Infusion (1) Boiled (1)	3	Often (3)	Helpful (3)

Continued Table 4.5: Diversity of crude herbs used by patients

Scientific Name (Local Name of Herbs)	Number of Users (n), percentage (%)	Part of Herbs (n)	Preparation Methods (n)	Current Users of Herbs	Frequency of Use (n)	Helpful in managing blood pressure (n)
Clinacanthus nutans (belalai gajah)	3, 3.33%	Leaves (3)	Raw (3)	3	Sometimes (2), rarely (1)	Helpful (2), not helpful (1)
Manihot esculenta (ubi kayu)	3, 3.33%	Leaves (3)	Raw (2) Steamed (1)	3	Often (3)	Helpful (1), not helpful (2)
Brassica oleracea (kubis)	3, 3.33%	Leaves (3)	Raw (3)	1	Often (2), Sometimes (1)	Helpful (1), Not helpful (2)
Mentha arvensis (pudina)	3, 3.33%	Leaves (3)	Infusion (3)	3	Often (1), Sometimes (2)	Helpful (1), Not sure (2)
Cuminum cyminum (jintan putih)	3, 3.33%	Seeds (3)	Infusion (3)	3	Often (2), Sometimes (1)	Helpful (3)
Lactuca sativa (salad)	3, 3.33%	Leaves (3)	Raw (3)	3	Often (3)	Helpful (3)

Continued Table 4.5: Diversity of crude herbs used by patients

Scientific Name (Local Name of Herbs)	Number of Users (n), percentage (%)	Part of Herbs (n)	Preparation Methods (n)	Current Users of Herbs	Frequency of Use (n)	Helpful in managing blood pressure (n)
Citrus aurantiifolia (limau nipis)	2, 2.22%	Fruit (2)	Blended into juice (2)	2	Sometimes (2)	Helpful (1), Not helpful (1)
Phaleria macrocarpa (mahkota dewa)	2, 2.22%	Fruit (1) Leaves (1)	Raw (1) Infusion (1)	2	Sometimes (2)	Helpful (2)
Mangifera indica (manga)	2, 2.22%	Leaves (1) Fruits (1)	Raw (2)	2	Sometimes (2)	Helpful (2)
Eurycoma longifolia (tongkat ali)	2, 2.22%	Roots (2)	Boiled (1), infusion (1)	2	Sometimes (1), rarely (1)	Helpful (2)
Psidium guajava (jambu batu)	2, 2.22%	Leaves (2)	Boiled (1), infusion (1)	2	Sometimes (2)	Helpful (2)
Orthosiphon aristatus (misai kucing)	2, 2.22%	Leaves (1), Leaves and root (1)	Boiled (2)	2	Sometimes (1), rarely (1)	Helpful (2)
Tamarindus indica (asam jawa)	2, 2.22%	Fruit (1), Leaves (1)	Infusion (2),	2	Often (2)	Helpful (2)

Continued Table 4.5: Diversity of crude herbs used by patients

Scientific Name (Local Name of Herbs)	Number of Users (n), percentage (%)	Part of Herbs (n)	Preparation Methods (n)	Current Users of Herbs	Frequency of Use (n)	Helpful in managing blood pressure (n)
Piper sarmentosum (daun kaduk)	1, 1.11%	Leaves (1)	Raw (1)	1	Sometimes (1)	Helpful (1)
Morinda citrifolia (mengkudu)	1, 1.11%	Fruit (1)	Raw (1)	1	Sometimes (1)	Helpful (1)
Brassica chinensis (sawi putih)	1, 1.11%	Leaves (1)	Raw (1)	1	Often (1)	Helpful (1)
Musa paradisiaca (pisang)	1, 1.11%	Flower (1)	Steamed (1)	1	Often (1)	Helpful (1)
Prunus avium (ceri)	1, 1.11%	Leaves (1)	Steamed (1)	1	Sometimes (1)	Helpful (1)
Andrographis paniculata (hempedu bumi)	1, 1.11%	Leaves (1)	Steamed (1)	1	Sometimes (1)	Helpful (1)
Mitragyna speciosa (ketum)	1, 1.11%	Leaves (1)	Raw (1)	0	Rarely (1)	Not Helpful (1)
*Phyllanthus acidus (*gooseberry*)*	1, 1.11%	Fruit (1)	Raw (1)	1	Sometimes (1)	Helpful (1)
Diplazium esculentum (sayur paku)	1, 1.11%	Leaves (1)	Raw (1)	1	Sometimes (1)	Helpful (1)

Continued Table 4.5: Diversity of crude herbs used by patients

Scientific Name (Local Name of Herbs)	Number of Users (n), percentage (%)	Part of Herbs (n)	Preparation Methods (n)	Current Users of Herbs	Frequency of Use (n)	Helpful in managing blood pressure (n)
Allium sativum (bawang putih)	1, 1.11%	Bulb (1)	Raw (1)	1	Often (1)	Not Helpful (1)
Murraya koenigii (daun kari)	1, 1.11%	Leaves (1)	Raw (1)	1	Often (1),	Not helpful (1)
Chrysanthemum morifolium (bunga kekwa)	1, 1.11%	Flowers (1)	Infusion (1)	1	Rarely (1)	Not helpful (1)
Solanum torvum (terung pipit)	1, 1.11%	Fruit (1)	Raw (1)	1	Often (1)	Not helpful (1)
Coriandrum sativum (daun ketumbar)	1, 1.11%	Leaves (1)	Infusion (1)	1	Often (1)	Helpful (1)
Solanum lycopersicum (tomato)	1, 1.11%	Fruit (1)	Raw (1)	1	Often (1)	Helpful (1)
Vigna unguiculata (asparagus)	1, 1.11%	Fruit (1)	Raw (1)	1	Sometimes (1)	Not helpful (1)
Citrus limon (limau)	1, 1.11%	Fruit (1)	Infusion (1)	1	Often (1)	Not helpful (1)
Actinidia deliciosa (kiwi)	1, 1.11%	Fruit (1)	Raw (1)	1	Often (1)	Not helpful (1)

Continued Table 4.5: Diversity of crude herbs used by patients

Scientific Name (Local Name of Herbs)	Number of Users (n), percentage (%)	Part of Herbs (n)	Preparation Methods (n)	Current Users of Herbs	Frequency of Use (n)	Helpful in managing blood pressure (n)
Vitis vinifera (anggur)	1, 1.11%	Fruit (1)	Raw (1)	1	Often (1)	Not helpful (1)
Citrus reticulata (mandarin)	1, 1.11%	Fruit (1)	Raw (1)	1	Rarely (1)	Helpful (1)
Trigonella foenum-graecum (fenugreek)	1, 1.11%	Leaves (1)	Infusion (1)	1	Often (1)	Helpful (1)
Abelmoschus esculentus (bendi)	1, 1.11%	Fruit (1)	Infusion (1)	1	Often (1)	Helpful (1)
Malus domestica and Cucumis sativus (epal hijau & timun)	1, 1.11%	Fruit (1)	Blended into juice (1)	1	Often (1)	Not helpful (1)
Vernonia amygdalina (bitter leaf)	1, 1.11%	Leaves (1)	Infusion (1)	1	Sometimes (1)	Helpful (1)

*Frequency of use: Often (≥ three times a month), Sometimes (once or twice a month), Rarely (less than twice in three months), n: number of users. Helpfulness in managing blood pressure is based on the user's perception of how the crude herbs helped them in hypertension control.

4.6.2 Disclosure of Crude Herbs Use to the Doctor

The participants disclosure on the crude herbs used to their respective doctors is tabulated in Table 4.6. A total of 84 (93.33%) of crude herbs users did not communicate their use of crude herbs with the doctor.

Table 4.6: Disclosure of crude herbs use to the doctor by users of crude herbs (n=90)

Inform doctor on Crude Herbs Use	Frequency	Percentage (%)
Yes	6	6.67
No	84	93.33

The main reasons for not informing were; the doctor did not ask (n=67, 79.76%), felt that eating herbs was normal (n=6, 7.14%) and no particular reason (n=6,7.14%) as shown in Table 4.7.

Table 4.7: Reasons given by patients for not informing doctor's about crude herbs use (n=84)

Reason	Frequency	Percentage (%)
The doctor did not ask	67	79.76
No particular reason	6	7.14
Felt that eating herbs was normal	6	7.14
Unsure about the herbs effects	5	5.95
Feared that the doctor might scold them	2	2.38
Did not feel the need to tell the doctor	2	2.38

4.6.3 Reasons for Taking Crude Herbs

Table 4.8 described several reasons which led crude herbs users to consume herbs. The main reasons given were as follows. Most users viewed that crude herbs were easily accessible to them (n=52, 57.78%). A number of users mentioned cultural reasons (n=51, 56.67%) and traditional beliefs (n=31,34.44%) for their crude herbs use. Besides, some users stated that herbs were appetizing (10%, n =9) while others felt that they only consumed herbs after listening to advice from family or friends (6.67%, n=6).

Table 4.8: Reasons behind patients use of crude herbs (n=90)

Reason	Frequency	Percentage (%)
Easily accessible	52	57.78
Cultural reasons	51	56.67
Traditional beliefs	31	34.44
Appetizing	9	10.00
Listen to friends or family's advice	6	6.67
Help to further reduce blood pressure	4	4.44
To maintain good health	2	2.22
Religious beliefs	2	2.22
Worried about their health	2	2.22
To cleanse the body	1	1.11
Dissatisfied with allopathic medication	1	1.11
As prevention for diseases	1	1.11

4.6.4 Sources of Recommendation for Herbs Use

As for sources of recommendation, crude herbs users cited family (83.3%, n=75) as the main source as shown in Table 4.9. The next two sources included friends (48.9%, n=44) and internet (12.2%, n=11). This that crude herbs users may have taken crude herbs after being persuaded by their close contacts, namely their friends and family members.

Table 4.9: Sources of recommendation for crude herbs use (n=90)

Source of Recommendation	Frequency	Percentage
Family	75	83.3
Friends	44	48.9
Internet	11	12.2
Newspaper	10	11.1
Television	7	7.8
Book	5	5.6
Store clerk	1	1.1
Pharmacist	1	1.1

4.7 Health-related Quality of Life Measurements

The HRQOL domain scores of the participants were estimated. The highest mean score was recorded for the social functioning domain had the (91.72 ± 17.13) while lowest score was recorded for the health change (41.07 ± 17.05) (Table 4.10). Crude herb users had higher mean score for physical functioning, social functioning, role limitations due to emotional problems, general health, energy or fatigue and health change domains. In contrast, the pain, emotional well-being and role limitations due to physical health domains were higher among the non-users of crude herbs. The HRQOL domain with the highest mean score was social functioning among crude herbs users (93.24 ± 14.84) and non-users (91.05 ± 18.05). The HRQOL domain, health change was similarly the lowest scoring domain among both the crude herbs users (47.40 ± 18.60) and non-users (46.89 ± 16.37).

Table 4.10: Health-related quality of life domains of patients attending Klinik Kesihatan Kampar

HRQOL domains	**Patients' HRQOL scores**	**Taking crude herbs**		**Mann-Whitney U value**	**p-value**
		Yes	No		
	(N = 294)	(N = 90)	(N = 204)		
	Mean ± SD	Mean ± SD	Mean ± SD		
Physical Functioning	78.62 ± 22.50	81.17 ± 20.57	77.50 ± 23.25	8626.5	-0.831, 0.406

Continued Table 4.10: Health-related quality of life domains of patients attending Klinik Kesihatan Kampar

HRQOL domains	Patients' HRQOL scores (N = 294) Mean ± SD	Taking crude herbs		Mann-Whitney U value	p-value
		Yes (N = 90) Mean ± SD	No (N = 204) Mean ± SD		
Role limitations due to physical health	65.56 ± 41.70	65.00 ± 43.51	65.81 ± 40.98	9177.5	-0.004, 0.997
Role limitations due to emotional problems	72.52 ± 37.97	73.65 ± 35.94	72.01 ± 38.90	9097.0	-0.143, 0.887
Energy/fatigue	60.62 ± 17.17	62.94 ± 13.46	59.59 ± 18.50	8271.5	-1.359, 0.174
Emotional well-being	78.07 ± 13.48	76.17 ± 15.05	78.90 ± 12.67	8282.5	-1.344, 0.179
Social functioning	91.72 ± 17.14	93.24 ± 14.84	91.05 ± 18.05	8780.5	-0.785, 0.433
Pain	84.38 ± 19.89	83.74 ± 20.40	84.67 ± 19.70	8840.0	-0.531, 0.595
General health	60.36 ± 13.15	60.83 ± 14.64	60.15 ± 12.48	8490.0	-1.038, 0.299
Health change	47.05 ± 17.05	47.40 ± 18.60	46.89 ± 16.37	9107.0	-0.125, 0.900

The Mann-Whitney's U test found no significant difference ($p>0.05$) between crude herbs users and non-users for all HRQOL domains as depicted in Figure 4.1.

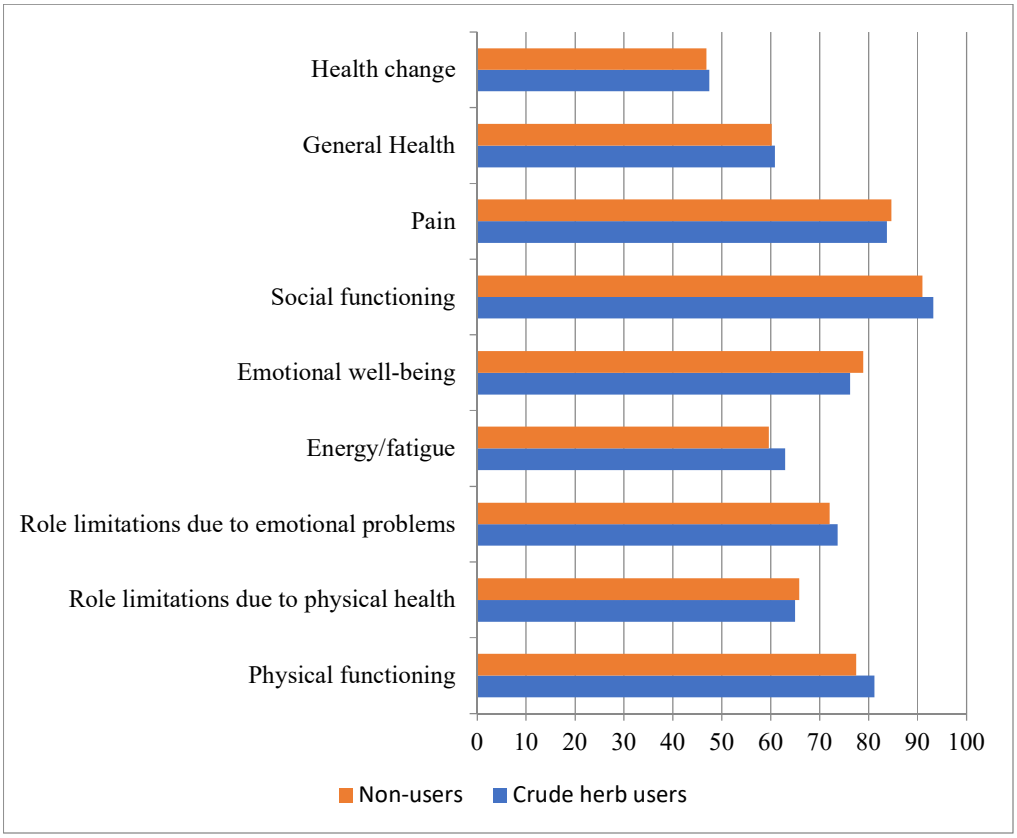

Figure 4.1: Mean scores of health-related quality of life domains for crude herb users and non-users

4.8 Patients' Perception on Herbs Use

The perception of herbs usage with conventional medicine was determined through qualitative interview. In-depth interviews were performed to explore the crude herbs users view on the concurrent use of crude herbs with conventional treatment.

4.8.1 Sociodemographic Details

The sociodemographic details of participants were detailed in Table 4.11. The age of the eight participants ranged from 48 to 71. There were six female participants and most of the participants did not have monthly income (n=3). A majority of them obtained secondary education (n=5), were unemployed (n-3) and were married (n=5).

Table 4.11 Sociodemographic details of in-depth-interview participants

Patient Id	Age (years)	Gender	Monthly Income	Employment status	Education level	Marital Status
A1	71	Female	No income	Unemployed	Primary	Widow
A2	51	Female	No income	Unemployed	Secondary	Married
A3	54	Male	Less than RM2500	Full-time	Secondary	Married
A4	61	Female	RM2500 to RM5000	Part-time	Tertiary	Widow
A5	57	Female	More than RM5000	Full-time	Tertiary	Married
A6	62	Male	Less than RM2500	Retired	Secondary	Married
A7	56	Female	No income	Retired	Secondary	Married
A8	48	Female	Less than RM2500	Unemployed	Secondary	Married

4.8.2 Thematic Analysis

Qualitative data analysis using QDA miner lite was performed and the main theme, subthemes and key issues were highlighted in Table 4.12.

Table 4.12: Overview of themes, subthemes and key issues among crude herbs users

Main theme	Subthemes	Key Issues
Perception of herbs use with conventional medicine	Herbs complement conventional medicine	▪ Herbs taken alongside conventional medication ▪ Wanted to reduce hypertension medication ▪ Herbs help reduce blood pressure readings
	Traditional ways	▪ Taking herbs considered as traditional ▪ Passed down from generation to generation
	Natural and less side effects	▪ Herbs had no negative impact to user ▪ Herbs have no side effects when consumed moderately
	Side effects of taking herbs	▪ Herbs brings down sugar levels
	For general wellbeing	▪ Remove toxins from body ▪ For general health purposes ▪ Improve overall condition ▪ Reduces cold symptoms

Perception of herbs use with conventional medicine

The crude herbs users with hypertension shared various perceptions of herbs use with conventional medicine. Below are the key issues raised by the users regarding their views on crude herbs usage:

- Herbs complement conventional medicine
- Traditional ways
- Natural and less side effects
- Self-management of other chronic diseases
- For general wellbeing

Herbs complement conventional medicine

Crude herbs users shared various perceptions on the ways herbs can complement conventional medicine. These perceptions will be vital to understanding why patients would seek crude herbs while being on conventional treatment.

Herbs taken alongside conventional medication

Some users took herbs together with conventional medication. In particular, one participant felt that despite drinking herbs, they still consumed their prescribed medicine daily.

"*I drink the herbs a little, but I still take medicine, that I follow. I take it in the morning. In the morning I take my medication*" – A2 – 51 years old; Indian female.

Another participant shared that they were afraid of stopping consumption of conventional medicine when asked if they would skip taking doctors medication although they were taking herbs.

"*No, I never do that. No, because I'm quite afraid. Because of the, you know the fact that I was diagnosed with, I mean because I've had that mild stroke incident. So, I wouldn't dare do that*" – A5 – 57 years old; Full-time working female

Wanted to reduce hypertension medication

A working female stated that by taking herbs with conventional medication, her hypertension medication dosage might be reduced by the doctor if her hypertension condition had improved.

"Eventually I mean, if err if the doctors find that my hypertension is better, probably they may decrease my dosage. So, I think that it is okay to take the herb together with the, with the hypertension medicine" – A5 – 57 years old; Full-time working female

Herbs help reduce blood pressure readings

A number of crude herbs users who were on hypertension medication mentioned that their blood pressure readings improved after consuming herbs. One user particularly mentioned that she did not take crude herbs on a regular basis but it did help reduce her blood sugar and improve hypertension condition

"I mean like I have checked, my sugar level after taking the Nithya Kalyani or the err, the err okra. You know, soaked overnight and I find that ya, it does improve the blood sugar reading and hypertension as well" – A5 – 57 years old; Indian Female.

Another participant shared that she took herbs when she had high pressure. After trying, she felt that her blood pressure readings had improved

"Last time, when I did not have anything, I just drink it.. err one week once, like after eating heavy, heavy food such as chicken or curry we cook, then I drink the herbs. But after I had high blood pressure, I started taking this (herbs), I think something that I haven't tried before. After trying I felt okay! I take this all the time, this herbal drink." – A2 – 51 years old; Indian Female

Traditional ways

Taking herbs considered as traditional

Some participants viewed that taking herbs was considered as traditional.

"*Not to say that, papaya leaves can be eaten as well as can be taken as a drink, what I mean is, I boil the yellow shoots and take it for health, it is like a traditional way*" – A1- 71 years old; Malay Female.

Passed down from generation to generation

Crude herbs users expressed that the practice of taking herbs had been passed down from generation to generation.

"These herbs, like for people like me, have been taking it from one generation to another generation" – A1- 71 years old; Malay Female.

Natural and less side effects

Herbs had no negative impact to user

One participant felt that taking herbs did not bring about any negative impacts to her, prompting her to try it out.

"*Well I've felt like it, if it doesn't really bring about a negative impact on me why not I try it. You know if it (herbs) can make it (blood pressure) better. If it can improve my overall health condition, I thought you know, why not give it a try*" – A5 – 57 years old, Full-time working female.

The same participant added that, herbs might help, thus out of curiosity she took it. She also felt that the herbs did affect the impact of the doctor's medication. In addition, she stated that she might get better after giving herbs a try.

"You know because people say these herbs can help. So, out of curiosity I just try because they say that it doesn't affect the medication that you're taking. So, I feel like it's okay. No harm I try. Maybe I can get better" – A5 – 57 years old, Full-time working female.

Herbs have no side effects when consumed moderately

Another participant explained that they felt encouraged to take herbs as it is natural and does not give side effects when taken in moderate amount.

"I am encouraged to use herbs as they are natural and less prone to side effects if consumed in moderately" – A1 – 61 years old; Indian female

Side effects of taking herbs

Herbs brings down sugar levels

A participant highlighted that taking bitter gourd blended with green apple reduced her blood sugar levels. However, she had reduced the consumption of these herbs as she felt it reduced her sugar levels too much.

"Lately I'm eating a lot of bitter gourd. I blend bitter gourd with green apple, however I become hypo soon after that. I eat and drink in the morning. The other night, I started to tremble. It (blood sugar) reduced very fast. That's why, now I drink it less because if I take it every night, I cannot sleep because it reduces a lot my blood sugar, I become hypo" – A7 – 56 years old; Malay Female

For general wellbeing

Remove toxins from body

One herbs user elaborated that by taking herbs it helped to get rid of toxins in the body.

"*For these herbs, it's easy to remove toxins from my body. My belly is not bloated, I have good appetite, and easy to pass motion. That's why I'm drinking these herbs*" – A2 – 51 years old; Indian Female

For general health purposes

Another view of the participant was the herbs was taken for general health purposes and stated that it helped give her appetite to eat.

"I feel there is some effect, but not like taking medication, it's just that the papaya leaves helps only, like it helps with appetite. Sometimes, we take the

medication or drink papaya leaves, it just feels the same, just that the papaya leaves are for overall health as well" – A1 – 71 years old; Malay Female

When asked the purpose of taking herbs, one participant in particular gave a simple response stating that it was good and brings good health.

"The herbs is really good, it helps me for my health" – A3 – 53 years old; Indian Male

Reduces cold symptoms

A female participant stated that taking herbs can also help with the cold.

"If we have cold, the cold can be healed" – A2 – 51 years old; Indian Female

Overall, the participants expressed that they took crude herbs for reasons beneficial to their blood pressure management and general wellbeing. They also perceived crude herbs as natural and do not contribute to much side effects. Most importantly, they relayed that taking crude herbs were complementary to their uptake of current hypertension medication provided by their doctor.

Chapter 5

DISCUSSION

5.1 Summary of Study Findings

From the systematic review, the prevalence of herbs used across the included studies showed a range of 6.5% to 69.0%. In addition, the herbs reportedly used by the included studies were diverse. As for the quantitative study, the number of participants in this study was 294, which was slightly lower than the sample size calculated. Thus, the confidence level reduced to 94.38%. However, as it is still close to 95% and larger than 90%, the confidence level is not affected. Data collection which was due to complete in March 2020 was affected by the COVID-19 outbreak in Malaysia, leading to a reduced number of participants. In this study, 30.6% of the participants took crude herbs. This indicates that although receiving treatment for hypertension, the recruited patients practiced taking crude herbs to self-manage their blood pressure. Besides, having secondary education, being Malay or Indian, experiencing falls, having muscle pain and with a systolic blood pressure of 140 mmHg or more were predictors of crude herbs use. There was no significant association between lifestyle modifications and crude herbs use. Crude herbs users had higher scores in most domains which include role limitations due to emotional problems, physical functioning, energy or fatigue, general health, social functioning, and health change domains. However, no significant association

for all the HRQOL domains between users and non-users of crude herbs was noted. The three main crude herbs used by patients were *C. asiatica*, *M. charantia* and *C. papaya*. About 93.3% of crude herbs users did not notify their physician on their crude herbs practices with the main reason being not queried by their physician on this matter. The main reason why patients took crude herbs was that it was easily accessible and the main source of recommendation of crude herbs was their family members. Based on the qualitative study, the subthemes related to the perception on crude herbs use were herbs complement conventional medicine, traditional ways, natural and less side effects, experienced side effects when taking herbs and for general wellbeing.

5.2 Associated Factors and Predictors of Crude Herbs Use

5.2.1 Sociodemographic Factors

For sociodemographic factors, being female, Malay or Indian race, having no monthly income and secondary education level were all significantly associated with crude herbs use. This was a contrast to similar studies conducted in Sierra Leone (James et al., 2018), Uganda (Musinguzi and Nuwaha, 2013) and Nigeria (Amira and Okubadejo, 2007) which found that no significant association was found between sociodemographic factors and crude herbs use. There were also studies performed in Palestine (Ali-Shtayeh et al., 2013) and Nigeria (Olisa and Oyelola, 2009) which found that older age was significantly associated with crude herbs use. However, age did not show significant association with crude herb use in this present study. These differences observed

may be due to various sample characteristics where some studies were performed in rural hospitals whereas others at university or government hospitals in urban or sub-urban centres. In addition, the participants in the present study had a narrow age range which could be another factor why no significant association was seen with age.

Although being female showed significant association after bivariate analysis, it was not determined to be a predictor after multivariate logistic regression analysis with the other variables being controlled. This finding resonated with a study by Pearson et al. (2018), who conducted a study on the use of herbal medicines among primary care centres outpatients in Cambodia. Furthermore, a study performed in an outpatient clinic in Iran and among the worker population in Thailand showed that the use of herbs was associated with female gender (Tajadini, 2015; Kanjanahattakij et al., 2019). Moreover, females who were middle aged and elderly would more likely be housewives who had time to cultivate herbs in their premises.

The findings from this study showed that Malay and Indian or other race patients had higher rate of using crude herbs. This may be attributed to religious and cultural factors as more Indians and Malays take crude herbs as compared to the Chinese. For Malays, consuming “ulam” has been a cultural norm while Chinese tend to take herbs in decoction form such as herbal tea and herbal mixtures. Ulam consists of traditional plants which are normally consumed as a

meal, either blanched or raw (Bachok et al., 2014). In the aspect of religion, a study conducted in Sepang, Malaysia found that one of the predictors of herb use among type 2 diabetes mellitus patients was being Muslim (Ching et al., 2013). All Malays in Malaysia virtually embrace Islamic religion. Another Middle Eastern study highlighted that the practice of medicinal herbs use was due to Islamic culture and belief whereby Muslims believe that herbs may be used as a treatment method for various health ailments (Al-Hadid et al., 2020). On the other hand, the local Indian community of Malaysia is accustomed with herbs use for treating disease, celebrating festivals, cooking and well-being; these customs could be traced to ancient times (Ohn Mar et al., 2017).

Another predictor for crude herbs use was having obtained secondary education and higher. This finding was similar to another survey done in Malaysia which indicated that higher educated patients were associated with use of crude herbs (Mahdfuz and Chan, 2005). This finding is in tandem with previous studies on CAM conducted in Turkey (Mollaoğlu and Aciyurt, 2013) and China (Chung et al., 2009). As Malaysia is still a developing country. Patients with higher education background may be keen to seek for knowledge on alternative methods to control their hypertension in natural ways thus spurring them to use crude herbs. In contrast, a survey performed in Palestine mentioned that crude herbs use was significantly associated with lower education background (Ali-Shtayeh et al., 2013). This may be due to patients relying on their deep-rooted beliefs in traditional herbal therapies that has been passed down for generations (Ali-Shtayeh et al., 2013).

5.2.2 Medical History

Bivariate analysis indicated that patients experiencing muscle pain, had falls in the past 6 months and have three or more comorbidities were significantly associated with use of crude herbs. However, the predictors for crude herbs use were only those who experienced falls in the last 6 months and having muscle pain. A previous qualitative study among elderly people who had falls found that several subjects practiced self-care by taking traditional medicine as they felt this treatment was effective (Loganathan, Ng and Low, 2016). A review performed by Meamarbashi (2017), showed that herbs like garlic and saffron have been utilized for the prevention and treatment of muscle soreness. The finding that patients with muscle pain and experienced falls were found to have higher rates of crude herbs use might imply that these patients may have taken herbs to manage multiple diseases other than their pre-existing hypertensive condition.

5.2.3 Systolic Blood Pressure

In addition, another important finding from this study was those with higher systolic pressure showed significantly higher odds of using crude herbs as compared to those with lesser systolic blood pressure levels. This may imply that patients' who could not lower their systolic blood pressure to the desired levels would take herbs. Several randomized control trials have shown that herbal medicine could reduce systolic blood pressure when combined with

antihypertensive drugs. A study by Ardalani et al. (2016), discovered that the group of subjects on *Rhus coriaria* powdered capsules and captopril showed significant reduction in systolic blood pressure from baseline when compared with the group on placebo and captopril. However, another trial performed in Indonesia showed that the group taking *Nigella sativa* extracts with antihypertensive medication did not show a significant reduction in systolic blood pressure when compared against the group taking placebo and antihypertensive medication (Rizka et al., 2017). These studies indicate that only some herbs may work well when paired with antihypertensive drugs. Not to mention, the crude herbs taken in the present study vastly differed from the clinical trials performed previously. Therefore, the antihypertensive properties of the common crude herbs used in this current study and its effects when taken with antihypertensive drugs should be further examined. Herb-drug interactions which may bring adverse and side effects to patients should be taken into consideration.

5.2.4 Interaction between Factors

The interaction between factors was studied and only two noteworthy interactions were noted. Firstly, when gender was analysed with race, in contrast with the other groups, Chinese males took more herbs than females. However, the number of samples for this group was low and could not be further studied. Future studies should explore this further. Besides, Malays showed a significant rate of increase in herb use with education level. This trend was similar for other races but the number of samples were limited.

5.3 Prevalence and Diversity of Crude Herbs Use

5.3.1 Prevalence of Crude Herbs Use

For this study around one third of hypertension patients from Klinik Kesihatan Kampar took crude herbs while receiving conventional treatment. The prevalence in the current study doubled the prevalence of herbal users in an earlier study performed in a primary care facility in Ipoh, Malaysia (Mahdfuz and Chan, 2005). Ipoh is the capital of Perak and is the considered an urban setting whereas Kampar is a developing semi-rural location. This finding was similar to a study performed in Sierra Leone, whereby the prevalence of herbs among more rural communities were higher than in urban centers (James et al., 2018). It is known that the use of herbs was higher in the rural community unlike among the urban residents (James et al., 2018). Moreover, patients in sub-urban locations were able to plant and cultivate herbs around their premises. Additionally, elderly patients with lower income status who tend to reside in sub-urban locations prefer crude herbs as supplements were too pricy (Tengku Mohamad, 2019). When compared with other countries, the prevalence obtained in this study was lesser than studies performed in South Africa (Peltzer, 2004), Nigeria (Olisa and Oyelola, 2009), Ghana (Kretchy, Owusu-Daaku and Danquah, 2014) and China (Hu et al., 2013). Whereas, the prevalence was higher than surveys from Turkey (Bahar et al., 2013), Palestine (Ali-Shtayeh et al., 2013), Jordan (Al-Hadid, et al., 2020) and Cambodia (Pearson, et al, 2018). The variation in prevalence seen could be down to a few factors such as different cultural practices of different ethnicities, alternate definitions of herbs used in

other studies and the diversity and availability of herbs species across locations with different climate.

5.3.2 Types of Crude Herbs

Crude herbs are part of CAM under the category of biological based therapies. In this study, crude herbs were taken together with conventional treatment by patients of Klinik Kesihatan Kampar. The crude herbs *Centella asiatica, Momordica charantia, Carica papaya, Cucumis sativus* and *Parkia speciosa* were the five main herbs with the highest use in this study. Similarly, two earlier local surveys found that *Centella asiatica*, *Carica papaya* and *Momordica charantia* were among the major herbs taken by hypertensive patients (Ching et al 2013; Mahdfuz and Chan, 2005). This similarity may be attributed to the accessibility and availability of these herbs in a tropical climate. This is further backed by ethnobotanical studies, which indicated that *Centella asiatica* and *Parkia speciosa* were both used as folk medicine by locals in Malaysia (Ong, Mat Zuki and Milow, 2011; Azliza, et al, 2012). Some common crude herbs used for blood pressure control reported in global studies were *Hibiscus sabdariffa*, *Allium sativa, Carthamus tinctorius, Aloe vera* and *Crataegus aronia* (Ali-shtayeh et al., 2013; Bahar et al., 2013; James et al., 2018; Tajadini, 2015; Wazaify, 2013). This was different to the common herbs used by patients with hypertension in the present study. Again, the factor of availability, geographical settings, traditional believes and culture may impact the types of herbs consumed by patients across the globe. The patient's health

seeking behaviour towards the types of herbs they wish to consume could also factor into this observed variation.

Several laboratory studies have shown that some of the main crude herbs used by the current study patient's had antihypertensive properties. One study highlighted that *C. asiatica* fraction had blood pressure lowering effects on phenylephrine-induced hypertensive rats (Harwoko, Pramono and Nugroho, 2014). *C. asiatica* was also used in an Indonesian herbal medicine decoction together with *Justicia gendarussa* and *Imperata cylindrica* known as CJID (*Centella asiatica*, *Justicia gendarussa* and *Imperata cylindrica* decoction). The CJID decoction was shown to reduce systolic blood pressure in spontaneous hypertensive rats by increasing cardiac superoxide dismutase (SOD) and suppressing cardiac-NADPH oxidase (NOX) expression (Sulistyowati et al., 2017). Besides, Khan et al. (2019) found that aqueous extracts of *M. oleifera* leaves stimulates release of endothelium-derived nitric oxide which stimulates vasodilation while Aekthammarat et al. (2020) proved that compounds found in *M. oleifera* could inhibit angiotensin converting enzyme (ACE) activity. Furthermore, methanolic extracts of *C. papaya* leaves inhibited the activity of ACE while its fruit juice exhibited alpha-adrenoceptor activity (Brasil et al., 2014; Eno et al., 2000). Another *in-vitro* study concluded that dichloromethane extracts of *C. caudatus* and *C. papaya* had moderate effects in inhibiting ACE activity (Loh and Hadira, 2011).

Undoubtedly, crude herbs may potentially act as antihypertensive agents as they are found to be rich in phytochemicals as discovered in previous literature. However, when crude herbs were concurrently with antihypertensive drugs, certain herb-drug interactions may occur. For instance, consuming these herbs may antagonize or potentiate the effects of antihypertensive medication which leads to alterations to the pharmacokinetics of a particular drug (Azizah et al., 2021). Some of the main crude herbs used by patients like *M. oleifera*, *C. asiatica* and *M. charantia* were shown to have inhibitory effects towards liver enzymes through *in vitro* studies. First and foremost, aqueous extracts of *M. oleifera* and certain metabolites were found to inhibit CYP1A2 and CYP3A4 respectively (Showande et al., 2018; Fantoukh et al., 2019). Secondly, an investigation by Savai et al. (2015), found that ethanolic extracts and methanolic extracts of *C. asiatica* displayed potent noncompetitive inhibition towards CYP2D6 and CYP3A4 respectively. Thus, they concluded that co-administering these extracts of *C. asiatica* together with drugs which are substrates of CYP2D6 and CYP3A4 may cause unwanted herb-drug interactions (Savai et al., 2015). Another group of researchers led by Pan et al. (2010) found that dichloromethane extracts of *C. asiatica* showed moderate to strong inhibitory effects towards CYP2C19 enzyme. As for *M. charantia*, extracts of this herb was found to inhibit CYP2C9 and CYP1A2 (Appiah-Opong et al., 2008).

There are several classes of antihypertensive drugs that can be used to treat hypertension. This includes, diuretics, alpha blockers, calcium channel

blockers and beta blockers. A number of these drugs are metabolized by cytochrome P450 enzymes. For instance, the calcium-channel blocker, amylodipine is metabolized by CYP3A4 to produce a pyridine derivative (Suchanova, Kostiainen and Ketola, 2008). As previously indicated, herbs such as *C. asiatica* and *M. oleifera* exhibits CYP3A4 inhibitory properties. Therefore, taking certain antihypertensive drugs concurrently with herbs that have cytochrome P450 enzyme inhibitory properties may alter the metabolism of drugs which could cause unwanted adverse effects and herb-drug interactions. Due to patient's wanting to self-manage their hypertension condition, they may consume herbs excessively thus unknowingly exposing themselves to herb-drug interactions. Therefore, the effects of concurrent use of these herbs with antihypertensive drugs should be further probed through *in vivo* studies and clinical trials. Patients and their respective doctors essentially must communicate effectively regarding the use of crude herbs by patients who were currently on a prescribed treatment regime. This practice could hinder any unnecessary effects or interactions and ensures that the patient's hypertensive condition is properly managed.

5.3.3 Disclosure of Crude Herbs Use to Physician

In this study, a high percentage of crude herbs users (93.3%) did not notify their physician on their practice of using crude herbs. This was higher than other previously conducted studies in Jordan; 77.4% (Wazaify et al., 2013), Palestine; 68.1% (Ali-Shtayeh, 2013), Sierra Leone; 85.1% (James et al., 2018), Nigeria; 71.2% (Olisa, 2009). Based on this comparison, it is obvious that a vast

majority of crude herbs users did not want to discuss their use of crude herbs with their physician. The main reason leading to this was that the doctor did not ask them about crude herbs. This was also noted in previous literature which suggested the reasons patients did not disclose the use of complementary and alternative medicine was not being asked by doctor or had the feeling that they would be misunderstood by the doctor (Chao, Wade and Kronenberg, 2008). Additionally, discussions about use of therapies other than conventional ones were rarely initiated by primary care physicians (Jou and Johnson, 2016). Patients were also afraid of being disapproved or admonished by doctors for taking another form of therapy (Jou and Johnson, 2016).

For patients to have the optimum treatment outcome, it is vital that doctors communicate with their patients regarding crude herb use. Doctors must be more aware of the possible barriers and reasons behind a patient's apparent lack of disclosure on this matter. However, physician's comfort towards the self care approaches adopted by patients and their concern with limited scientific evidence on the safety and efficacy of herbs may influence their decision with regards to communicating about herbs with their patients (Shelly et al., 2009). Thus, knowledge related to alternative therapies such as herbs should be integrated in the curriculum of physicians and information on the effectiveness of these therapies should be disseminated among various healthcare practitioners more efficiently. This would allow physicians to advice their patients accordingly.

5.3.4 Reason for Using Crude Herbs

The two main reasons mentioned by crude herbs users for using herbs were cultural factors and ease of accessibility. Earlier studies cited the following reasons for taking herbs; conventional medicine being too pricy; unsatisfied with conventional medicine; family tradition; good experience when using herbs in the past (Liwa et al., 2013; Welz, Emberger-Klein and Menrad, 2018). In the present study patients were not dissatisfied with the conventional therapies given to them, however taking crude herbs was mostly due to their cultural background and ease of obtaining the herbs. Malaysia, which is comprised of multiple ethnicities namely Malay, Indian and Chinese have extensively inherited knowledge and practice regarding traditional herbs (Adnan and Othman, 2012). Rituals, practical experiences and observation which were derived from cultural appropriations and religious beliefs were the basis for the use of herbs in Malaysia (Law and Soon, 2013). Adding to this, it is essential to further explore the reasons why patients took crude herbs through in-depth interviews or focus-group discussions.

5.3.5 Sources of Recommendation

For this study, family and friends were the two main sources of recommendation for crude herbs use among patients with hypertension. This result shared similarities with two studies performed in Iran and Palestine which found that friends and family mainly recommended the use of herbal therapies (Ali-Shtayeh et al., 2013; Tajadini et al., 2015). This indicates that patients have

a strong trust towards the advice of people close to them especially family members. The fact that crude herbs users don't obtain their source of information from a more valid and qualified person is concerning. Although family members have good intentions when recommending these herbs, some of them may still be unaware of the disruptions it might cause towards hypertension management. Preferably, patients should obtain scientifically proven information from healthcare professionals, herbalists or verified websites.

5.4 Health-Related Quality of Life

To this point, studies relating health-related quality of life to the use of herbs among patients with hypertension are limited to none. Patients with chronic conditions like hypertension may attempt to take CAM modalities such as crude herbs to improve their quality of life. This study found that patients scored the highest for social functioning, pain, physical functioning, and emotional well-being. The three lowest score were for the domains general health, energy/fatigue and health change. This finding was mirrored by a previous study performed in an urban area of Malaysia where social functioning was the highest scored domain while general health held the lower score among patients with hypertension (Khaw, Hassan and Latiff, 2011). Social functioning had the highest score probably due to the patient's ability to cope and adapt to their condition (Khaw, Hassan and Latiff, 2011). This means that patient's have been able to carry on with their social lifestyle and interactions despite being diagnosed with hypertension. The HRQOL indices obtained in this present

study among patients with hypertension were higher than a Malaysian study in all domains except role limitations due to emotional problems (Khaw, Hassan and Latiff, 2011). The previous study was performed 10 years earlier in a urban area. The advancement of medical care and the peaceful rural lifestyle could have contributed to the higher HRQOL indices obtained in the current study.

There are no significant differences between crude herbs users and non-users were observed for the nine SF-36. A Malaysian study among cardiovascular disease patients also highlighted that no significant differences in HRQOL were determined between CAM users and non-users (Than, et al., 2019). Furthermore, a previous investigation among breast cancer patients on chemotherapy, found no significant differences for quality of life among CAM users and non users (Chui, et al., 2015). Contrastingly, a study performed in Normal among inflammatory bowel disease patients found statistically significant lower scores for SF-36 among users of CAM as compared to non-users (Opheim et al., 2016). This could be because patient's that took CAM were suffering from severe progression of the disease and wanted to try a different option.

Although no significance in HRQOL indices were observed among users and non-users of crude herbs, the mean score of users were higher for six out of the nine domains which included social functioning, physical functioning, energy/fatigue, role limitations due to emotional problems, health change and

general health. This could imply that the use of crude herbs could have slightly improved the HRQOL among patients with hypertension. This could be justified by a study which concluded that the use of a herbal oil improved the quality of life multiple sclerosis patients (Majdinasab et al, 2018). However, more studies should indeed explore the impact of consuming herbs on the health-related quality of life among hypertension patients.

5.5 Patients' Perception on Herbs Use

Several sub-themes and key issues emerged from the qualitative analysis. One of the sub themes was participants mentioned that herbs were complement to conventional medication. In particular, a participant felt that by using herbs with conventional medication, medication dosage might be reduced while one participant felt that despite drinking herbs, they still consumed their prescribed medicine daily. This was similar to a previous study which found that participants viewed complementary therapies as an additional choice and that they evaluated conventional medication as safe and reliable (Danell, 2015). However, in a different study, participants expressed contrasting statements when it came to use of herbs with conventional medication. A participant mentioned that you should not mix medications as you would not know which treatment helps you feel better. On the other hand, another individual expressed that it is alright to take herbs concurrently but you must know when to do so (Liwa, et al., 2017).

From this study, participants cited taking herbs was part of traditional ways and it was passed down from generation to generation which was similar to the reasons provided in the quantitative study. This finding resonated with previous literature whereby the motivation for the use of herbal medication was attributed to long-standing family traditions and information on "what helps" were passed down across generations (Welz, Emberger-Klein and Menrad, 2018).

The current study highlighted some contrasting perspectives when it came to the safety of using crude herbs. From the interviews, some participants expressed, herbs were natural and had no side effects. This view was similarly shared by focus-group study participants in an earlier study who viewed herbal medicine as more natural, healthier and gave little to no side effects (Welz, Emberger-Klein and Menrad, 2018). However, one study participant elaborated on some side effects of taking herbs as a drop in her sugar level was noted after taking the herbs. According to a review by Ekor (2014), the issues of adverse effects related to herbs consumption continue to increase due to the previous misconception of herbs being "safe" due to them being considered "natural". Hence, despite herbs being perceived as a traditional treatment and natural, the awareness on possible side effects and unwanted interactions among patients should not go unnoticed.

5.6 Limitations of Study

The systematic review had a number of limitations. Firstly, no mean prevalence for herbs could be obtained as 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 included 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.

As for the quantitative study, it employed a cross-sectional study design; therefore, the causal relationships between the predictors and outcome could not be determined. Besides, the effectiveness of using herbs while receiving treatment from the clinic could not be determined. The present study findings also may not represent the entire Malaysians with hypertension, as this study was performed among patients in a suburban government clinic. In addition, language barriers arose as this study was conducted in English and Bahasa

Melayu, limiting the inclusion of individuals who could only communicate in Tamil, Cantonese or Mandarin. Moreover, the "others" group for ethnicity is small, limiting the accuracy of the inference for this group. Despite these limitations, this study explained the pattern of crude herb use among patients with hypertension receiving primary care. To our knowledge, this is the first study to be evaluate the herb use with both quantitative and qualitative approach. This will eventually pave way for future studies in this field on targeted groups of patients.

5.7 Future Recommendations

As patients continue to take crude herbs for self-management of hypertension, future investigations should determine the safety and efficacy of taking both herbs and conventional medication through laboratory investigations, animal studies and clinical trials. Some of the common herbs reported in this present study can be the main focus of investigation. Besides, the communication between patients and healthcare professionals seems to be severely lacking. Education programmes to aid patients make informed decisions should be developed and conducted regularly. Other means of delivering information such as through websites and mobile apps should be prioritized in this age of digitalization. To properly develop education programmes, mobile applications and websites, information on herbs use should be thoroughly examined through systematic and scoping reviews. In addition, qualitative studies on patients and healthcare providers' needs for information,

barriers and facilitators on usage of herbs, safety and effects of different forms of herbs should be performed. The future study can focus on developing an intervention to debunking misinformation on herbs and herb use. This is not just about herb misuse by patients but also missed opportunities to use herbs due to healthcare providers misconception about herbs.

CHAPTER 6

CONCLUSION

All in all, the systematic 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. Similarly in the quantitative study, the practice of using crude herbs among hypertension patients receiving treatment in health clinics was found to be common and diverse. The predictors identified: being Malay or Indian, having muscle pains, having secondary education or higher, experiencing falls, and having a systolic blood pressure of more than 140 mmHg; would allow us to identify the possible group of patients using crude herbs for hypertension. This study identified different types of crude herbs usage give no significant impact on HRQOL among hypertensive patients on medication. The patients perceived that crude herbs use are traditional, natural and gives no side effects. A guideline and information on evidence-based crude herbs usage targeted to patients on medication is warranted. Healthcare workers should practice good communication with patients on this issue to avoid unwanted side effects and

herb-drug interactions. Future investigations on herb-drug interactions, barriers and perceptions of healthcare staff and patients towards the usage of herbs for hypertension and implementation of education programmes to aid both patients and healthcare staff to properly understand the implications of taking crude herbs with conventional medication are most welcomed. The findings from this study could also provide valuable information for the development of education programmes which focus on patients' needs related to crude herbs use for hypertension management.

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APPENDIX A

ADDITIONAL RESULTS FOR SYSTEMATIC REVIEW

A.1 Characteristics of Studies included in Systematic Review

The appendix provides additional results for the systematic review and quantitative study. Table A.1 shows the characteristics of included studies in the systematic review.

Table A.1: Characteristics 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

APPENDIX B

SYSTEMATIC REVIEW SEARCH STRINGS

Table A.2 details the search terms used to obtain articles for systematic review from five databases; PubMED, Scopus, PBSC, CINAHL and Web of Science.

Table A.2: Search Terms for Databases

Database	Search Terms
PubMED	S1: "hypertension"[Mesh] OR hypertensi*[Title/Abstract] OR antihypertensi*[Title/Abstract] OR hypertensive[Title/Abstract] OR "increased blood pressure" [Title/Abstract] OR "high blood pressure" [Title/Abstract] OR "elevated blood pressure" [Title/Abstract] S2: "plants, medicinal"[Mesh] OR herb[Title/Abstract] OR herbs[Title/Abstract] OR herbal*[Title/Abstract] OR ethnomedici*[Title/Abstract] OR ethnopharma*[Title/Abstract] OR ethnobotan*[Title/Abstract] OR "Traditional herbal medicine" [Title/Abstract] OR "Traditional herbal medicines" [Title/Abstract] OR "traditional herb" [Title/Abstract] OR "traditional herbs" [Title/Abstract] OR "traditional plant" [Title/Abstract] OR "traditional plants" [Title/Abstract] OR "Natural herb" [Title/Abstract] OR "natural herbs" [Title/Abstract] OR "Natural plant" [Title/Abstract] OR "natural plants"[Title/Abstract] OR "biological based therapy" [Title/Abstract] OR "biologically based therapy" [Title/Abstract] OR "biological based therapies" [Title/Abstract] OR "biologically based therapies" [Title/Abstract] OR "complementary and alternative medicine" [Title/Abstract] OR "complementary and alternative medicines" [Title/Abstract] OR "complementary therapies"[Mesh] OR "complementary medicine" [Title/Abstract] OR "complementary medicines" [Title/Abstract] OR "native medicine" [Title/Abstract] OR "native medicines" [Title/Abstract] OR "natural remedy" [Title/Abstract] OR "natural remedies"[Title/Abstract] OR "folk medicine" [Title/Abstract] OR "folk medicines" [Title/Abstract] OR "Traditional and Complementary Medicine" [Title/Abstract] OR "local herb" [Title/Abstract] OR "local herbs" [Title/Abstract] OR "alternative medicine" [Title/Abstract] OR "alternative medicines" [Title/Abstract] OR "alternative therapy" [Title/Abstract] OR "alternative therapies" [Title/Abstract] OR "alternative healing agents" [Title/Abstract] S3: "Patients"[Mesh] OR patient[Title/Abstract] OR patients[Title/Abstract] OR subject[Title/Abstract] OR subjects[Title/Abstract] OR outpatient[Title/Abstract] OR outpatients[Title/Abstract] OR "primary care patient" [Title/Abstract] OR "primary care patients"[Title/Abstract] OR "chronic patient" [Title/Abstract] OR "chronic patients" [Title/Abstract]

	S4: S1 AND S2 AND S3
Scopus	((TITLE-ABS-KEY ("medicinal plants" OR herb OR herbs OR herbal* OR ethnomedici* OR ethnopharma* OR ethnobotan* OR "Traditional herbal medicine" OR "Traditional herbal medicines" OR "traditional herb" OR "traditional herbs" OR "traditional plant" OR "traditional plants") OR TITLE-ABS-KEY ("Natural herb" OR "natural herbs" OR "Natural plant" OR "natural plants" OR "biological based therapy" OR "biologically based therapy" OR "biological based therapies" OR "biologically based therapies" OR "complementary and alternative medicine") OR TITLE-ABS-KEY ("complementary and alternative medicines" OR "complementary therapies" OR "complementary medicine" OR "complementary medicines" OR "native medicine" OR "native medicines" OR "natural remedy" OR "natural remedies" OR "folk medicine") OR TITLE-ABS-KEY ("folk medicines" OR "Traditional and Complementary Medicine" OR "local herb" OR "local herbs" OR "alternative medicine" OR "alternative medicines" OR "alternative therapy" OR "alternative therapies" OR "alternative healing agents"))) AND (TITLE-ABS-KEY (patient OR patients OR subject OR subjects OR outpatient OR outpatients OR "primary care patient" OR "primary care patients" OR "chronic patient" OR "chronic patients")) AND (TITLE-ABS-KEY (hypertension OR hypertensi* OR antihypertensi* OR hypertensive OR "increased blood pressure" OR "high blood pressure" OR "elevated blood pressure")
Web of Science	S1: TS=(hypertension OR hypertensi* OR antihypertensi* OR hypertensive OR "increased blood pressure" OR "high blood pressure" OR "elevated blood pressure") S2: TS=("medicinal plants" OR herb OR herbs OR herbal* OR ethnomedici* OR ethnopharma* OR ethnobotan* OR "Traditional herbal medicine" OR "Traditional herbal medicines" OR "traditional herb" OR "traditional herbs" OR "traditional plant" OR "traditional plants" OR "Natural herb" OR "natural herbs" OR "Natural plant" OR "natural plants" OR "biological based therapy" OR "biologically based therapy" OR "biological based therapies" OR "biologically based therapies" OR "complementary and alternative medicine" OR "complementary and alternative medicines" OR "complementary therapies" OR "complementary medicine" OR "complementary medicines" OR "native medicine" OR "native medicines" OR "natural remedy" OR "natural remedies" OR "folk medicine" OR "folk medicines" OR "Traditional and Complementary Medicine" OR "local herb" OR "local herbs" OR "alternative medicine" OR "alternative medicines" OR "alternative therapy" OR "alternative therapies" OR "alternative healing agents") S3: TS=(Patients OR patient OR subject OR subjects OR outpatient OR outpatients OR "primary care patient" OR "primary care patients" OR "chronic patient" OR "chronic patients") S4: S1 AND S2 AND S3
CINAHL	S1: TI (hypertensi* OR antihypertensi* OR hypertensive OR "increased blood pressure" OR "high blood pressure" OR "elevated blood pressure") OR AB (hypertensi* OR antihypertensi* OR hypertensive OR "increased blood pressure" OR "high blood pressure" OR "elevated blood pressure") OR (MH "hypertension")

S2: TI (herb OR herbs OR herbal* OR ethnomedici* OR ethnopharma* OR ethnobotan* OR “Traditional herbal medicine” OR “Traditional herbal medicines” OR “traditional herb” OR “traditional herbs” OR “traditional plant” OR “traditional plants” OR “Natural herb” OR “natural herbs” OR “Natural plant” OR “natural plants” OR “biological based therapy” OR “biologically based therapy” OR “biological based therapies” OR “biologically based therapies” OR “complementary and alternative medicine” OR “complementary and alternative medicines” OR “complementary medicine” OR “complementary medicines” OR “native medicine” OR “native medicines” OR “natural remedy” OR “natural remedies” OR “folk medicine” OR “folk medicines” OR “Traditional and Complementary Medicine” OR “local herb” OR “local herbs” OR “alternative medicine” OR “alternative medicines” OR “alternative therapy” OR “alternative therapies” OR “alternative healing agents”) OR AB (herb OR herbs OR herbal* OR ethnomedici* OR ethnopharma* OR ethnobotan* OR “Traditional herbal medicine” OR “Traditional herbal medicines” OR “traditional herb” OR “traditional herbs” OR “traditional plant” OR “traditional plants” OR “Natural herb” OR “natural herbs” OR “Natural plant” OR “natural plants” OR “biological based therapy” OR “biologically based therapy” OR “biological based therapies” OR “biologically based therapies” OR “complementary and alternative medicine” OR “complementary and alternative medicines” OR (MH "complementary therapies") OR “complementary medicine” OR “complementary medicines” OR “native medicine” OR “native medicines” OR “natural remedy” OR “natural remedies” OR “folk medicine” OR “folk medicines” OR “Traditional and Complementary Medicine” OR “local herb” OR “local herbs” OR “alternative medicine” OR “alternative medicines” OR “alternative therapy” OR “alternative therapies” OR “alternative healing agents”) OR (MH "plants, medicinal") OR (MH "complementary therapies")

S3: TI (patients OR patients OR subject OR subjects OR outpatient OR outpatients OR “primary care patient” OR “primary care patients” OR “chronic patient” OR “chronic patients”) OR AB (patients OR patients OR subject OR subjects OR outpatient OR outpatients OR “primary care patient” OR “primary care patients” OR “chronic patient” OR “chronic patients”) OR (MH "Patients")

S3: S1 AND S2 AND S3

PBSC

S1: (MH "hypertension") OR TI (hypertensi* OR antihypertensi* OR hypertensive OR “increased blood pressure” OR “high blood pressure” OR “elevated blood pressure”) OR AB (hypertensi* OR antihypertensi* OR hypertensive OR “increased blood pressure” OR “high blood pressure” OR “elevated blood pressure”)

1.1.1 S2: (MH "plants, medicinal") OR TI (herb OR herbs OR herbal* OR ethnomedici* OR ethnopharma* OR ethnobotan* OR “Traditional herbal medicine” OR “Traditional herbal medicines” OR “traditional herb” OR “traditional herbs” OR “traditional plant” OR “traditional plants” OR “Natural herb” OR “natural herbs” OR “Natural plant” OR “natural plants” OR “biological based therapy” OR “biologically based therapy” OR “biological based therapies” OR “biologically based therapies” OR “complementary and alternative medicine” OR “complementary and alternative medicines” OR (MH "complementary therapies") OR “complementary medicine” OR “complementary medicines” OR “native medicine” OR “native medicines” OR “natural

remedy” OR “natural remedies” OR “folk medicine” OR “folk medicines” OR “Traditional and Complementary Medicine” OR “local herb” OR “local herbs” OR “alternative medicine” OR “alternative medicines” OR “alternative therapy” OR “alternative therapies” OR “alternative healing agents”) OR AB (herb OR herbs OR herbal* OR ethnomedici* OR ethnopharma* OR ethnobotan* OR “Traditional herbal medicine” OR “Traditional herbal medicines” OR “traditional herb” OR “traditional herbs” OR “traditional plant” OR “traditional plants” OR “Natural herb” OR “natural herbs” OR “Natural plant” OR “natural plants” OR “biological based therapy” OR “biologically based therapy” OR “biological based therapies” OR “biologically based therapies” OR “complementary and alternative medicine” OR “complementary and alternative medicines” OR (MH "complementary therapies") OR “complementary medicine” OR “complementary medicines” OR “native medicine” OR “native medicines” OR “natural remedy” OR “natural remedies” OR “folk medicine” OR “folk medicines” OR “Traditional and Complementary Medicine” OR “local herb” OR “local herbs” OR “alternative medicine” OR “alternative medicines” OR “alternative therapy” OR “alternative therapies” OR “alternative healing agents”)

S3: (MH "Patients") OR TI (patients OR patients OR subject OR subjects OR outpatient OR outpatients OR “primary care patient” OR “primary care patients” OR “chronic patient” OR “chronic patients”) OR AB (patients OR patients OR subject OR subjects OR outpatient OR outpatients OR “primary care patient” OR “primary care patients” OR “chronic patient” OR “chronic patients”)

S4: S1 AND S2 AND S3

APPENDIX C

QUALITY ASSESMENT FOR SYSTEMATIC REVIEW ARTICLES

Table A.3 indicates the quality assessment for systematic review included articles using the AXIS tool.

Table A.3: Quality Assessment using Axis Tool

First Author	Akansel	Ali-Shtayeh	Amira	Bahar	Gohar	Hu	James	Kretchy	Mahfudz	Olisa	Peltzer	Pelzer	Ching	Tajadini	Toprak	Wazaify
Were the aims and objecti of study clear?	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Was the study design appropriate for the stated aim(s)?	No	Yes	Don't Know	Don't Know	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Was the sample size justified?	No	No	No	No	No	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	No	No
Was the target/reference population clearly defined (Is it clear who the researc was about?)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Was the sample frame tak from an appropriate population base so that it closely represented the target/reference populatio under investigation?	Yes	No	Yes	No	Don't Know	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	No	No

Was the selection process likely to select subjects/participants that were representative of the target/reference populatio under investigation?	No	Yes	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No
Were measures undertake address and categorise no responders?	No	No	No	No	Yes	No	No	No	No	Yes	No	Yes	Yes	Yes	No	Yes
Were the risk factor and outcome variables measur appropriate to the aims of study?	No	Yes	yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were the risk factor and outcome variables measur correctly using	No	No	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes

instruments/measurements that had been trialled, pilo or published previously?																
Is it clear what was used t determined statistical significance and/or precisi estimates? (e.g. p-values, confidence intervals)	No	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were the methods (includ statistical methods) sufficiently described to enable them to be repeate	No	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	No
Were the basic data adequately described?	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Does the response rate rai: concerns about non-respoi bias?	No	Don't Kno w	No	Don't Know	No	No	No	No	No	No	Don't Know	No	No	No	Don't Know	No
If appropriate, was information about non-responders described?	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	No	No	Yes
Were the results internally consistent?	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Were the results presented for all the analyses descrit in the methods?	No	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes
Were the authors' discussi and conclusions justified t the results?	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Were the limitations of the study discussed?	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes
Were there any funding sources or conflicts of interest that may affect the authors' interpretation of t results	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Overall quality of paper	P	S	P	S	G	G	G	S	P	G	G	G	G	S	S	S

*P: Poor, S: Satisfactory, G: Goo

APPENDIX D

PROSPERO PROTOCOL

Systematic review

Fields that have an asterisk (*) next to them means that they must be answered. Word limits are provided for each section. You will be unable to submit the form if the word limits are exceeded for any section. Registrant means the person filling out the form.

1. * Review title.

Give the title of the review in English

Crude herbs integration among hypertension patients: a systematic review

2. Original language title.

For reviews in languages other than English, give the title in the original language. This will be displayed with the English language title.

3. * Anticipated or actual start date.

Give the date the systematic review started or is expected to start.

04/06/2019

4. * Anticipated completion date. [1 change]

Give the date by which the review is expected to be completed.

28/04/2020

5. * Stage of review at time of this submission.

This field uses answers to initial screening questions. It cannot be edited until after registration.

Tick the boxes to show which review tasks have been started and which have been completed.

Update this field each time any amendments are made to a published record.

The review has not yet started: No

Review stage	Started	Completed
Preliminary searches	Yes	Yes
Piloting of the study selection process	Yes	Yes
Formal screening of search results against eligibility criteria	Yes	No
Data extraction	No	No
Risk of bias (quality) assessment	No	No
Data analysis	No	No

Provide any other relevant information about the stage of the review here.

6. * Named contact.

The named contact is the guarantor for the accuracy of the information in the register record. This may be any member of the review team.

Annaletchumy Loganathan

Email salutation (e.g. "Dr Smith" or "Joanne") for correspondence:
Dr Anna

7. * Named contact email.

Give the electronic email address of the named contact.

annal@utar.edu.my

8. Named contact address

PLEASE NOTE this information will be published in the PROSPERO record so please do not enter private information, i.e. personal home address

Give the full institutional/organisational postal address for the named contact.

Department of Allied Health Science, Faculty of Science, Jalan Universiti, Bandar Barat, 31900 Kampar, Negeri Perak, Malaysia

9. Named contact phone number.

Give the telephone number for the named contact, including international dialling code.

05-4688888 4511
0126979747

10. * Organisational affiliation of the review.

Full title of the organisational affiliations for this review and website address if available. This field may be completed as 'None' if the review is not affiliated to any organisation.

Universiti Tunku Abdul Rahman

Organisation web address:
http://www.utar.edu.my/main.jsp

11. * Review team members and their organisational affiliations. [1 change]

Give the personal details and the organisational affiliations of each member of the review team. Affiliation refers to groups or organisations to which review team members belong.
NOTE: email and country now MUST be entered for each person, unless you are amending a published record.

Mr Raphael Joe. Universiti Tunku Abdul Rahman
Dr Annaletchumy Loganathan. Universiti Tunku Abdul Rahman
Professor Chirk Jenn Ng. Universiti of Malaya
Dr Chin Hai Teo. Universiti of Malaya

12. * Funding sources/sponsors.

Details of the individuals, organizations, groups, companies or other legal entities who have funded or sponsored the review.

Not applicable

14. Collaborators.

Give the name and affiliation of any individuals or organisations who are working on the review but who are not listed as review team members. **NOTE: email and country must be completed for each person, unless you are amending a published record.**

15. * Review question.

State the review question(s) clearly and precisely. It may be appropriate to break very broad questions down into a series of related more specific questions. Questions may be framed or refined using PI(E)COS or similar where relevant.

What is the prevalence, of herbs integration among hypertensive patients?

What are some of the types/diversity of herbs used by hypertension patients to manage their condition?

16. * Searches. [1 change]

State the sources that will be searched (e.g. Medline). Give the search dates, and any restrictions (e.g. language or publication date). Do NOT enter the full search strategy (it may be provided as a link or attachment below.)

The search will be conducted using 5 databases: PubMed, CINAHL, Web of Science, Scopus and Psychology & Behavioral Sciences Collection. Additional references will be obtained using reference mining and Google Scholar.

The search strategy includes terms relevant to the topic and the type of study for this systematic review. The search strategy will be tailored for each database.

17. URL to search strategy.

Upload a file with your search strategy, or an example of a search strategy for a specific database, (including the keywords) in pdf or word format. In doing so you are consenting to the file being made publicly accessible.

Or provide a URL or link to the strategy. Do NOT provide links to your search **results**.

Do not make this file publicly available until the review is complete

18. * Condition or domain being studied.

Give a short description of the disease, condition or healthcare domain being studied in your systematic review.

Hypertension prevalence among the world population has continued to rise over the past few years. This chronic condition could lead to various other conditions such as cardiovascular disease. Despite numerous conventional therapies, the management of this chronic non-communicable disease continues to be a challenge. Recently, there has been increasing evidence on the integration of herbs to manage hypertension among patients especially from developing countries.

19. * Participants/population.

Specify the participants or populations being studied in the review. The preferred format includes details of both inclusion and exclusion criteria.

Inclusion: Adult (aged 18 years and above) diagnosed with hypertension,
Exclusion: Pregnant women

20. * Intervention(s), exposure(s). [1 change]

Give full and clear descriptions or definitions of the interventions or the exposures to be reviewed. The preferred format includes details of both inclusion and exclusion criteria.

This is a review on observational studies regarding the prevalence of herbs used by hypertension patients. The inclusion criteria is patients diagnosed with hypertension and have attended an outpatient clinic for regular appointments.

21. * Comparator(s)/control. [1 change]

Where relevant, give details of the alternatives against which the intervention/exposure will be compared (e.g. another intervention or a non-exposed control group). The preferred format includes details of both inclusion and exclusion criteria.

This review does not involve intervention studies, hence observational studies do not have a comparator or control.

22. * Types of study to be included. [1 change]

Give details of the study designs (e.g. RCT) that are eligible for inclusion in the review. The preferred format includes both inclusion and exclusion criteria. If there are no restrictions on the types of study, this should be stated.

We will include observational studies with available data on prevalence of herbs integration to manage hypertension and the diversity of herbs used by these patients. Studies performed at settings other than outpatient clinics will be rejected.

23. Context.

Give summary details of the setting or other relevant characteristics, which help define the inclusion or exclusion criteria.

Study is conducted at a primary care clinic or hospital among outpatients

24. * Main outcome(s).

Give the pre-specified main (most important) outcomes of the review, including details of how the outcome is defined and measured and when these measurement are made, if these are part of the review inclusion criteria.

The main outcome is the prevalence of herbs integration among patients to manage hypertension

Measures of effect
Not applicable

25. * Additional outcome(s). [1 change]

List the pre-specified additional outcomes of the review, with a similar level of detail to that required for main outcomes. Where there are no additional outcomes please state 'None' or 'Not applicable' as appropriate to the review

Diversity of herbs used by patients to manage hypertension
Associated factors of herbs use among hypertension patients

Measures of effect
Not applicable

26. * Data extraction (selection and coding). [1 change]

Describe how studies will be selected for inclusion. State what data will be extracted or obtained. State how this will be done and recorded.

Data will be collected using a data extraction sheet designed using Microsoft Excel.

Information on the Articles such as title, authors, publication date, journal, and objectives of study will be extracted. In addition, study characteristics such as study design, study setting, study participants characteristics, sample size, and data collection tools will be extracted.

27. * Risk of bias (quality) assessment.

State which characteristics of the studies will be assessed and/or any formal risk of bias/quality assessment tools that will be used.

The cross-sectional studies obtained will be assessed using the AXIS tool. The assessment was performed independently by two different reviewers and discrepancies were solved by consensus.

28. * Strategy for data synthesis. [1 change]

Describe the methods you plan to use to synthesise data. This **must not be generic text** but should be **specific to your review** and describe how the proposed approach will be applied to your data.
If meta-analysis is planned, describe the models to be used, methods to explore statistical heterogeneity, and software package to be used.

A formal narrative synthesis which includes study setting, prevalence, diversity of herbs and associated factors of herbs used among hypertensive patients will be presented.

The prevalence of herbs will be compared according to study setting, study methodology, types of herbs, and background of the study.

Data synthesis will be conducted independently by the first author and the corresponding author. Any discrepancies will be solved with the advice of the remaining authors.

29. * Analysis of subgroups or subsets.

State any planned investigation of 'subgroups'. Be clear and specific about which type of study or participant will be included in each group or covariate investigated. State the planned analytic approach.

Not applicable

30. * Type and method of review. [1 change]

Select the type of review, review method and health area from the lists below.

Type of review

Cost effectiveness	No
Diagnostic	No
Epidemiologic	No
Individual patient data (IPD) meta-analysis	No
Intervention	No
Living systematic review	No
Meta-analysis	No
Methodology	No
Narrative synthesis	Yes
Network meta-analysis	No
Pre-clinical	No
Prevention	No
Prognostic	No
Prospective meta-analysis (PMA)	No

Review of reviews	No
Service delivery	No
Synthesis of qualitative studies	No
Systematic review	Yes
Other	No

Health area of the review

Alcohol/substance misuse/abuse	No
Blood and immune system	No
Cancer	No
Cardiovascular	Yes
Care of the elderly	No
Child health	No
Complementary therapies	Yes
COVID-19	No
Crime and justice	No
Dental	No
Digestive system	No
Ear, nose and throat	No
Education	No
Endocrine and metabolic disorders	No
Eye disorders	No
General interest	No
Genetics	No
Health inequalities/health equity	No
Infections and infestations	No
International development	No
Mental health and behavioural conditions	No
Musculoskeletal	No
Neurological	No
Nursing	No

Obstetrics and gynaecology	No
Oral health	No
Palliative care	No
Perioperative care	No
Physiotherapy	No
Pregnancy and childbirth	No
Public health (including social determinants of health)	No
Rehabilitation	No
Respiratory disorders	No
Service delivery	No
Skin disorders	No
Social care	No
Surgery	No
Tropical Medicine	No
Urological	No
Wounds, injuries and accidents	No
Violence and abuse	No

31. Language.

Select each language individually to add it to the list below, use the bin icon to remove any added in error.

English

There is not an English language summary

32. * Country.

Select the country in which the review is being carried out. For multi-national collaborations select all the countries involved.

Malaysia

33. Other registration details.

Name any other organisation where the systematic review title or protocol is registered (e.g. Campbell, or The Joanna Briggs Institute) together with any unique identification number assigned by them.
If extracted data will be stored and made available through a repository such as the Systematic Review Data Repository (SRDR), details and a link should be included here. If none, leave blank.

34. Reference and/or URL for published protocol.

If the protocol for this review is published provide details (authors, title and journal details, preferably in Vancouver format)

No I do not make this file publicly available until the review is complete

35. Dissemination plans.

Do you intend to publish the review on completion?

Yes

36. Keywords. [1 change]

Give words or phrases that best describe the review. Separate keywords with a semicolon or new line. Keywords help PROSPERO users find your review (keywords do not appear in the public record but are included in searches). Be as specific and precise as possible. Avoid acronyms and abbreviations unless these are in wide use.

Hypertension
Complementary and Alternative Medicine (CAM)
Herbal Medicine
Herbal Products
Herbs
Systematic Review
Observational Studies
Cross-sectional Studies
Prevalence

37. Details of any existing review of the same topic by the same authors.

If you are registering an update of an existing review give details of the earlier versions and include a full bibliographic reference, if available.

38. * Current review status.

Update review status when the review is completed and when it is published.
New registrations must be ongoing so this field is not editable for initial submission.

Review_Ongoing

39. Any additional information.

Provide any other information relevant to the registration of this review.

40. Details of final report/publication(s) or preprints if available.

Leave empty until publication details are available OR you have a link to a preprint (NOTE: this field is not editable for initial submission).
List authors, title and journal details preferably in Vancouver format.

APPENDIX E

DATA COLLECTION TOOLS FOR QUANTITATIVE STUDY

ENGLISH QUESTIONNAIRE

Wholly owned by UTAR Education Foundation
(Co. No. 578227-M)
DU012(A)

QUESTIONNAIRE

UNIVERSITI TUNKU ABDUL RAHMAN
Institute of Postgraduate Studies and Research
Faculty of Science
Master of Science

Title: Crude Herbs Integration into Conventional Care and Its Effect on the Quality Of Life among Patients with Hypertension

Dear Participants,

- I am a Master's of Science student from Universiti Tunku Abdul Rahman (UTAR) Kampar Campus. I am doing a study among hypertension patients in government clinics in the Kinta District.
- The purposes of this study are to describe the crude herbs integration by multiethnic primary care patients attending urban and sub-urban health clinics, and to compare quality of life of the hypertension patients who integrate crude herbs with those who do not integrate crude herbs.

- Please read through and consider the information carefully before deciding to participate. Your participation in this study is voluntary and you may withdraw at any point of time. Please read the personal data protection statement and give your consent before participating in this study.
- The information from this study is solely used for research purpose only and all the information obtained will be kept confidential and will not be revealed to any party.
- This questionnaire would take roughly 30 minutes to be completed, and I would greatly appreciate if you could spare some time to complete this questionnaire.
- There are no correct or wrong answers to questions. You are advised to choose option that best describes you or your opinion.
- If you have further queries, please contact Dr Annaletchumy, Telephone number, 05-4688888 ext 4511, email, annal@utar.edu.my.
- Thank you for your participation and your cooperation would be greatly appreciated

Personal Data Protection Statement

Please be informed that in accordance with Personal Data Protection Act 2010 "PDPA" which come into force on 15 November 2013, Universiti Tunku Abdul Rahman, UTAR is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

Notice:

1. The purposes for which your personal data may be used are inclusive but not limited to:-
    - For assessment of any application to UTAR
    - For processing any benefits and services
    - For communication purposes
    - For advertorial and news
    - For general administration and record purposes
    - For enhancing the value of education
    - For educational and related purposes consequential to UTAR
    - For the purpose of our corporate governance
    - For consideration as a guarantor for UTAR staff/ student applying for his/her scholarship/ study loan
2. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such

other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.

3. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.

4. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Consent:

1. By submitting this form you hereby authorise and consent to us processing (including disclosing) your personal data and any updates of your information, for the purposes and/or for any other purposes related to the purpose.

2. If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to 139ulfil our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.

3. You may access and update your personal data by writing to us at dhr@utar.edu.my

[ ] I have been notified by you and that I hereby understood, consented and agreed per UTAR above notice.

[ ] I disagree, my personal data will not be processed.

Signature: _____

Name: _____ Date:

Section A: Socio Demographic Characteristics

1. Date of birth (day/month/year): _____

Please tick (√) where appropriate

2. Gender
   - ○ Male
   - ○ Female
3. Race
   - ○ Malay
   - ○ Chinese
   - ○ Indian
   - ○ Others (please specify): _____
4. Household income
   - ○ No income
   - ○ Below RM3000
   - ○ RM 3000-RM6000
   - ○ Above RM 6000
5. Education level
   - ○ No formal education
   - ○ Primary education
   - ○ Secondary education
   - ○ Tertiary education
6. Current employment status
   - ○ Employed (Full-time)
   - ○ Employed (Part-time)
   - ○ Housewife/Homemaker
   - ○ Unemployed

○ Retired

Please state previous employment:

Section B: Disease Details and High Blood Pressure (Hypertension) Management

1. For how long have you been diagnosed with high blood pressure?

   _____ years

2. Has your doctor prescribed you with any medicine to lower blood pressure?
   - O Yes
   - O No
3. Are you taking the blood pressure medication given by your doctor?
   - O Yes
   - O No
4. Are you taking crude herbs to manage your high blood pressure?
   - O Yes
   - O No

Section C: Lifestyle Changes for High Blood Pressure Management

1. Are you practicing the following lifestyle changes to manage your high blood pressure? (You may tick more than one)
   - O Trying to reduce body weight
   - O Maintaining a healthy body weight
   - O Reduce sodium (salt) intake
   - O Reduce/stop alcohol consumption
   - O Regular physical activity (at least 90 minutes a week)
   - O Healthy eating (as advised by your doctor)
   - O Reduce/stop smoking
   - O Stress management
   - O Increased dietary potassium intake (fruits, nuts, vegetables and legumes)
   - O Others: _____
   - O Not practicing any lifestyle changes

Section D: Medical History

Besides high blood pressure, were you diagnosed with any other diseases?

No.	Medical History	Yes	No	Not sure
1	Asthma	☐	☐	☐
2	Cancer (Type of cancer:_____)	☐	☐	☐
3	Cardiovascular disease (e.g. *Heart disease*)	☐	☐	☐
4	Diabetes mellitus (*High blood glucose*)	☐	☐	☐
5	Dyslipidemia (*Abnormal amount of lipids (cholesterol/fat) in blood*)	☐	☐	☐
6	Hyperuricaemia *(High level of uric acid in blood)*	☐	☐	☐
7	Kidney disease (*Kidney do not work effectively*)	☐	☐	☐
8	Leukemia	☐	☐	☐
9	Hepatitis, Jaundice, Liver disease	☐	☐	☐
10	Migraine or recurrent headaches	☐	☐	☐
11	Muscle pain (*Due to tension, over work, or muscle injury from exercise*)	☐	☐	☐
12	Obesity (*High body fat. BMI ≥ 30*)	☐	☐	☐
13	Parkinson's disease (*Tremor, muscular rigidity, and slow, imprecise movement*)	☐	☐	☐
14	Peptic ulcer (*Burning stomach pain*)	☐	☐	☐
15	Stroke	☐	☐	☐
16	Thyroid disease	☐	☐	☐
17	Urinary infection (Chronic type: *Infection involving the kidneys, ureters, bladder, or urethra*)	☐	☐	☐
18	Falls/with injury in the past 6 to 12 months (an unexpected event in when a person comes to rest on the ground, floor or lower level).	☐	☐	☐
19	Osteoporosis	☐	☐	☐
20	Others (Please list out):			

Section E: RAND 36-Item Health Survey 1.0 Questionnaire

Choose one option for each questionnaire item. Please tick (√) where appropriate

1. In general, would you say your health is:

○ 1 – Excellent

○ 2 – Very good

○ 3 – Good

○ 4 – Fair

○ 5 – Poor

2. Compared to one year ago, how would you rate your health in general now?

○ 1 – Much better now than one year ago

○ 2 – Somewhat better now than one year ago

○ 3 – About the same

○ 4 – Somewhat worse now than one year ago

○ 5 – Much worse now than one year ago

The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
3. Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports	○ 1	○ 2	○ 3
4. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	○ 1	○ 2	○ 3
5. Lifting or carrying groceries	○ 1	○ 2	○ 3
6. Climbing several flights of stairs	○ 1	○ 2	○ 3
7. Climbing one flight of stairs	○ 1	○ 2	○ 3
8. Bending, kneeling or stooping	○ 1	○ 2	○ 3
9. Walking more than a kilometer	○ 1	○ 2	○ 3
10. Walking several hundred meters	○ 1	○ 2	○ 3
11. Walking one hundred meters	○ 1	○ 2	○ 3
12. Bathing or dressing yourself	○ 1	○ 2	○ 3

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

	Yes	No

13. Cut down the amount of time you spent on work or other activities	○ 1	○ 2
14. Accomplished less than you would like	○ 1	○ 2
15. Were limited in the kind of work or other activities	○ 1	○ 2
16. Had difficulty performing the work or other activities (for example, it took extra effort)	○ 1	○ 2

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)?

	Yes	No
17. Cut down the amount of time you spent on work or other activities	○ 1	○ 2
18. Accomplished less than you would like	○ 1	○ 2
19. Didn't do work or other activities as carefully as usual	○ 1	○ 2

20. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

○ 1 – Not at all
○ 2 – Slightly
○ 3 – Moderately
○ 4 – Quire a bit

○ 5 – Extremely

21. How much bodily pain have you had during the past 4 weeks?

○ 1 – None

○ 2 – Very mild

○ 3 – Mild

○ 4 – Moderate

○ 5 – Severe

○ 6 – Very severe

22. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?

○ 1 – Not at all

○ 2 – A little bit

○ 3 – Moderately

○ 4 – Quire a bit

○ 5 – Extremely

These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks…

	All of the time	Most of the time	A good bit of the time	Some of the time	A little of the time	None of the time

23. Did you feel full of life?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
24. Have you been a very nervous person?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
25. Have you felt so sad and low in mood that nothing could cheer you up?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
26. Have you felt calm and peaceful?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
27. Did you have a lot of energy?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
28. Have you felt downhearted and depressed?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
29. Did you feel worn out?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
30. Have you been a happy person?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
31. Did you feel tired?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6

32. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with you social activities (like visiting with friends, relatives, etc.)?

○ 1 – All of the time

○ 2 – Most of the time

○ 3 – Some of the time

○ 4 – A little of the time

○ 5 – None of the time

How TRUE or FALSE is each of the following statements for you.

	Definitely true	Mostly true	Don't know	Mostly false	Definitely false
33. I seem to get sick a little easier than other people	○ 1	○ 2	○ 3	○ 4	○ 5
34. I am as healthy as anybody I know	○ 1	○ 2	○ 3	○ 4	○ 5
35. I expect my health to get worse	○ 1	○ 2	○ 3	○ 4	○ 5
36. My health is excellent	○ 1	○ 2	○ 3	○ 4	○ 5

Section F: International Complementary and Alternative Medicine (I-CAM-Q) adapted for studies among Malaysian Hypertension Patients

Over the **past 12 months**, have you seen any of the following health care providers for high blood pressure treatment and management?			Number of times you saw this provider in **the last 3 months**	How helpful was it for you to see this provider (Please tick only one)			
	Yes	No		Very Helpful	Somewhat Helpful	Not Helpful	Don't Know
Physician/doctor	☐	☐	_____	☐	☐	☐	☐

Chiropractor	☐	☐	_____	☐	☐	☐	☐
Homeopath provider	☐	☐	_____	☐	☐	☐	☐
Acupuncturist	☐	☐	_____	☐	☐	☐	☐
Herbalist/Naturopath	☐	☐	_____	☐	☐	☐	☐
Spiritual Healer	☐	☐	_____	☐	☐	☐	☐
Chinese Physician	☐	☐	_____	☐	☐	☐	☐
Traditional Malay Medicine Practitioner	☐	☐	_____	☐	☐	☐	☐
Traditional Indian Medicine Practitioner	☐	☐	_____	☐	☐	☐	☐
Others: _____	☐	☐	_____	☐	☐	☐	☐
Others: _____	☐	☐	_____	☐	☐	☐	☐

Visiting health care providers: Health conditions (high blood pressure) can be attended to by a variety of traditional and complementary health care providers.

Self Help Practices for High Blood Pressure Management.

	Number of times you	How helpful was it for you to use this self-help practice for high

Have you used any of the following self-help practices to manage high blood pressure in the last 12 months?			used this self-help practice in **the last 3 months**	blood pressure management (Please tick only one)			
	Yes	No		Very Helpful	Somewhat Helpful	Not Helpful	Don't Know
Siddha home remedy	☐	☐	_____	☐	☐	☐	☐
Yoga	☐	☐	_____	☐	☐	☐	☐
Qigong/ Tai Chi	☐	☐	_____	☐	☐	☐	☐
Meditation	☐	☐	_____	☐	☐	☐	☐
Attended traditional healing ceremony	☐	☐	_____	☐	☐	☐	☐
Praying for own health	☐	☐	_____	☐	☐	☐	☐
Spa therapy	☐	☐	_____	☐	☐	☐	☐
Color vibration therapy	☐	☐	_____	☐	☐	☐	☐
Unani (traditional arab medicine)	☐	☐	_____	☐	☐	☐	☐
Reiki	☐	☐	_____	☐	☐	☐	☐
Phytobiophysics	☐	☐	_____	☐	☐	☐	☐
Pranayama	☐	☐	_____	☐	☐	☐	☐

Crystal therapy	☐	☐	_____	☐	☐	☐	☐
Others : _____	☐	☐	_____	☐	☐	☐	☐
Others: _____	☐	☐	_____	☐	☐	☐	☐

Use of Herbal Medicine and Dietary Supplements, including tablets, capsules and liquids.

For each category below, please list up to three products you have used in the last 12 months.	Do you **currently** use this product?		Number of times you used this product in **the last 3 months**	How helpful did you find this product in managing high blood pressure (Please tick only one)			
	Yes	No		Very Helpful	Somewhat Helpful	Not Helpful	Don't Know

Crude Herbs							
Please refer to Section G, questions 1 to 4							
Herbal Medicine							
	☐	☐	_____	☐	☐	☐	☐
	☐	☐	_____	☐	☐	☐	☐
	☐	☐	_____	☐	☐	☐	☐
Vitamins, minerals or other supplements							
	☐	☐	_____	☐	☐	☐	☐
	☐	☐	_____	☐	☐	☐	☐
	☐	☐	_____	☐	☐	☐	☐

*For participants who use **crude herbs for high blood pressure management**, please proceed to **Section G** of this questionnaire. For participants who do not use crude herbs, please proceed to **Section H**

Section G: Crude herbs Used by Patients to manage High Blood Pressure

1. Please complete the table below

Crude herbs taken over the **past 12 months**	Herb's part	Preparation methods	Do you currently use this product?	For how long have you been using this product?	Number of times you used this product in **the last 3 months**	How helpful did you find this product in managing high blood pressure (Please tick only one)
			☐			○ Very Helpful ○ Somewhat Helpful ○ Not Helpful ○ Don't Know
			☐			○ Very Helpful ○ Somewhat Helpful ○ Not Helpful ○ Don't Know
			☐			○ Very Helpful ○ Somewhat Helpful ○ Not Helpful ○ Don't Know
			☐			○ Very Helpful ○ Somewhat Helpful ○ Not Helpful ○ Don't Know

			☐			○ Very Helpful ○ Somewhat Helpful ○ Not Helpful ○ Don't Know

2. Is your physician aware of you consuming crude herbs to manage high blood pressure?

○ Yes

○ No (Please give your reason:

---

3. What are your reasons for taking crude herbs to manage high blood pressure? (You may tick **more than one**)

○ Traditional belief on the effectiveness of crude herbs

○ Dissatisfied with conventional medicine

○ Easily accessible

○ Cultural reasons

○ Religious beliefs

○ Worried of the side effects of conventional medicine

○ Others (Please state):

_____

4. How do you get the information on the use of crude herbs? (You may tick **more than one**)

○ Books/Magazines

○ Newspaper

○ Television

○ Internet websites

○ Pharmacists

○ Doctor

- ○ Store clerk/sales assistant
- ○ Specialist in Chinese/Malay/Indian traditional medicine
- ○ Friend/Neighbours
- ○ Family or relatives
- ○ Others (please

  state:_____)

Section H: BMI and Blood Pressure Measurements

1. **Body Mass Index**

   Height : _____ cm

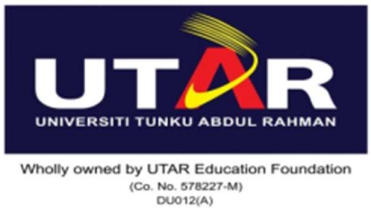
   Weight : _____ kg

   BMI : _____

2. **Arterial blood pressure: _____**

Thank you for participating in this survey

MALAY QUESTIONNAIRE



BORANG SOAL SELIDIK

UNIVERSITI TUNKU ABDUL RAHMAN
Institute of Postgraduate Studies and Research
Faculty of Science
Master of Science

Tajuk: Integrasi Herba Mentah dalam Penjagaan Konvensional dan Kesannya terhadap Kualiti Hidup dalam kalangan Pesakit Hipertensi

Peserta yang dihormati,

- Saya ialah seorang pelajar Sarjana Sains dari Universiti Tunku Abdul Rahman (UTAR) Kampus Kampar. Saya sedang membuat satu kajian dalam kalangan pesakit tekanan darah tinggi di klinik kerajaan tertendu di Daerah Kinta.
- Tujuan kajian ini adalah untuk menggambarkan pengunaan herba oleh pesakit penjagaan utama pelbagai etnik yang datang ke klinik kesihatan bandar dan sub-bandar, dan membandingkan kualiti hidup pesakit tekanan darah tinggi yang mengunakan herba mentah dengan mereka yang tidak menggunakan herba mentah.
- Sila baca dan mempertimbangkan maklumat dengan teliti sebelum membuat keputusan untuk mengambil bahagian dalam kajian ini. Penyertaan anda dalam

kajian ini adalah secara sukarela dan anda boleh menarik diri pada bila-bila masa. Sila baca kenyataan perlindungan data peribadi dan memberikan persetujuan anda sebelum mengambil bahagian dalam kajian ini.

- Maklumat daripada kajian ini adalah semata-mata digunakan untuk tujuan penyelidikan sahaja dan semua maklumat yang diperolehi akan dirahsiakan dan tidak akan didedahkan kepada mana-mana pihak
- Soal selidik ini akan mengambil masa kira-kira 30 minit untuk disiapkan, dan saya amat menghargai jika anda boleh meluangkan masa untuk melengkapkan soal selidik ini.
- Tiada jawapan yang betul atau salah untuk setiap soalan. Anda dinasihatkan untuk memilih pilihan paling tepat yang menggambarkan anda atau pendapat anda.
- Jika anda mempunyai sebarang pertanyaan lanjut, sila hubungi Dr Annaletchumy, Nombor telefon, 05-4688888 ext 4511, e-mel, annal@utar.edu.my.
- Terima kasih atas penyertaan anda dan kerjasama anda amat dihargai

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For assessment of any application to UTAR

For processing any benefits and services

For communication purposes

For advertorial and news

For general administration and record purposes

For enhancing the value of education

For educational and related purposes consequential to UTAR

For the purpose of our corporate governance

For consideration as a guarantor for UTAR staff/ student applying for his/her scholarship/ study loan

Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.

Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.

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Consent:

By submitting this form you hereby authorise and consent to us processing (including disclosing) your personal data and any updates of your information, for the purposes and/or for any other purposes related to the purpose.

If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfill our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.

You may access and update your personal data by writing to us at dhr@utar.edu.my

[ ] I have been notified by you and that I hereby understood, consented and agreed per UTAR above notice.

[ ] I disagree, my personal data will not be processed.

Signature: _____

Name: _____ Date: _____

Bahagian A: Ciri-ciri Socio-Demographi

1. Tarikh Lahir (hari/bulan/tahun): _____

Sila tandakan (√) di pilihan yang sesuai

2. Jantina
   - ○ Lelaki
   - ○ Perempuan
3. Kaum
   - ○ Melayu
   - ○ Cina
   - ○ India
   - ○ Asli
   - ○ Sikh
   - ○ Lain-lain (sila jelaskan): _____

4. Gaji
   - ○ Tiada Pendapatan
   - ○ Bawah RM3000
   - ○ RM 3000-RM6000
   - ○ RM 6000 dan ke atas
5. Tahap Pendidikan
   - ○ Tidak menerima pendidikan formal dari sekolah
   - ○ Sekolah rendah
   - ○ Sekolah menengah
   - ○ Pendidikan tinggi daripada kolej/universiti
6. Status Pekerjaan Terkini
   - ○ Bekerja (Penuh-Masa)
   - ○ Bekerja (Separuh-Masa)
   - ○ Bekerja Sendiri
   - ○ Suri rumah tangga
   - ○ Penganggur
   - ○ Pesara

     Sila nyatakan pekerjaan anda yang terdahulu:

     _____

Bahagian B: Maklumat berkenaan tekanan darah tinggi (Hipertensi) dan Pengurusannya

7. Untuk berapa lama anda telah disahkan menghidap tekanan darah tinggi?

   _____ tahun

8. Adakah doktor anda ditetapkan anda dengan mana-mana ubat tekanan darah tinggi?
   - ○ Ya
   - ○ Tidak

9. Adakah anda mengambil ubat darah tinggi yang ditetapkan oleh doktor anda?
   - ○ Ya
   - ○ Tidak
10. Adakah anda mengambil herba mentah untuk menguruskan tekanan darah tinggi anda?
   - ○ Ya
   - ○ Tidak

Bahagian C: Perubahan Gaya Kehidupan Untuk Pengurusan Hipertensi

11. Adakah anda mengamalkan perubahan gaya hidup berikut untuk menguruskan tekanan darah tinggi anda? (Anda boleh tanda lebih dari satu)
   - ○ Cuba untuk mengurangkan berat badan
   - ○ Mengekalkan berat badan yang sihat
   - ○ Mengurangkan pengambilan natrium (garam)
   - ○ Mengurangkan / menghentikan pengambilan alcohol
   - ○ Bersenam denga kerap (sekurang-kurangnya 90 minit seminggu)
   - ○ Pemakanan sihat (seperti yang dinasihatkan oleh doktor anda)
   - ○ Kurangkan / berhenti merokok
   - ○ Pengurusan stress
   - ○ Peningkatan pengambilan kalium pemakanan (buah-buahan, kacang, sayur-sayuran dan kekacang)

- ○ Lain-lain: _____
- ○ Tidak mengamalkan perubahan gaya hidup

Bahagian D: Latar Belakang Perubatan

12. Selain daripada tekanan darah tinggi, adakah anda disahkan menghidap mana-mana penyakit lain?

No	Sejarah Perubatan	Ya	Tidak	Tidak pasti
1	Asma	☐	☐	☐
2	Kanser (Jenis kanser:_____)	☐	☐	☐
3	Penyakit kardiovaskular (*penyakit jantung*)	☐	☐	☐
4	Kencing Manis/Diabetis	☐	☐	☐
5	Kolesterol / Lemak tinggi	☐	☐	☐
6	Asid Urik tinggi	☐	☐	☐
7	Penyakit buah pinggang	☐	☐	☐
8	Kanser darah/leukemia	☐	☐	☐
9	Hepatitis, Jaundis, Penyakit hati	☐	☐	☐
10	Migrain, Sakit kepala yang berulang-ulang	☐	☐	☐
11	Sakit Otot (*disebabkan oleh ketegangan, kuat kerja, atau kecederaan otot dari senaman*)	☐	☐	☐
12	Obesiti (*Lemak badan tinggi. BMI ≥ 30*)	☐	☐	☐
13	Penyakit Parkinson (*gegaran, ketegaran otot, dan pergerakan yang perlahan*)	☐	☐	☐
14	Ulser peptik (sakit perut)	☐	☐	☐
15	Strok	☐	☐	☐
16	Penyakit tiroid	☐	☐	☐

17	Jangkitan Saluran Kencing (*Jangkitan yang melibatkan buah pinggang, ureter, pundi kencing, atau uretra*)	☐	☐	☐
18	Jatuh/dan cedera dalam tempoh 6 hingga 12 bulan yang lepas (Jatuh tanpa dijangka dan dimana seseorang yang jatuh itu akan mencecah paras lantai atau lebih rendah daripadanya)	☐	☐	☐
19	Osteoporosis	☐	☐	☐
20	Lain-lain (Sila nyatakan):			

Bahagian E: RAND 36-Item Health Survey 1.0 Questionnaire

Pilih satu jawapan untuk setiap soalan berikut. Sila tandakan (√) di mana sesuai.

Secara umum, adakah anda akan mengatakan bahawa kesihatan anda adalah:

○ 1 – Paling baik

○ 2 – Sungguh baik

○ 3 – Baik

○ 4 – Sederhana

○ 5 – Tidak baik

Berbanding dengan setahun yang lalu, bagaimanakah anda menilai kesihatan anda secara umum sekarang?

○ 1 – Jauh lebih baik sekarang daripada setahun yang lalu

○ 2 – Agak lebih baik sekarang daripada setahun yang lalu

○ 3 – Lebih kurang sama dengan setahun yang lalu

○ 4 – Agak teruk sekarang daripada setahun yang lalu

○ 5 – Lebih teruk sekarang daripada setahun yang lalu

Soalan-soalan berikut adalah mengenai aktiviti yang mungkin akan dilakukan oleh anda pada hari biasa. Adakah anda terhad di dalam sebarang aktiviti berikut kerana keadaan kesihatan anda sekarang? Jika ya, sejauh mana?

	Ya, terbatas dengan banyaknya	Ya, terbatas dengan sedikitnya	Tidak, tidak terbatas sama sekali
Aktiviti yang bertenaga dan sihat, seperti berlari, mengangkat barang berat, menyertai sukan yang memerlukan tenaga dan kekuatan	○ 1	○ 2	○ 3
Aktiviti sederhana, seperti mengalihkan meja, menyapu, bermain badminton atau bercucuk tanam	○ 1	○ 2	○ 3
Mengangkat atau membawa barang-barang runcit	○ 1	○ 2	○ 3

Menaiki beberapa larian tangga	○ 1	○ 2	○ 3
Menaiki satu larian tangga	○ 1	○ 2	○ 3
Membengkok, melutut atau membongkok	○ 1	○ 2	○ 3
Berjalan lebih daripada satu kilometer	○ 1	○ 2	○ 3
Berjalan beberapa ratus meter	○ 1	○ 2	○ 3
Berjalan seratus meter	○ 1	○ 2	○ 3
Mandi atau memakai pakaian sendiri	○ 1	○ 2	○ 3

Dalam masa 4 minggu yang lalu, berapa kerapkah anda mengalami sebarang masalah berikut dengan pekerjaan atau aktiviti harian tetap anda yang lain akibat daripada kesihatan fizikal anda?

	Ya	Tidak
Mengurangkan jumlah masa yang dihabiskan oleh anda untuk pekerjaan atau aktiviti lain	○ 1	○ 2
Mencapai kurang daripada yang diingini	○ 1	○ 2
Terbatas dari segi jenis pekerjaan atau aktiviti lain	○ 1	○ 2
Mempunyai kesukaran untuk melakukan pekerjaan atau aktiviti lain (misalnya, ia memerlukan usaha yang lebih)	○ 1	○ 2

Dalam masa 4 minggu yang lalu, berapa kerapkah anda mengalami sebarang masalah berikut dengan pekerjaan atau aktiviti harian tetap anda yang lain akibat daripada sebarang masalah emosi (seperti merasa murung atau bimbang)?

	Ya	Tidak
Mengurangkan jumlah masa yang dihabiskan oleh anda untuk pekerjaan atau aktiviti lain	○ 1	○ 2
Mencapai kurang daripada yang diingini	○ 1	○ 2

Melakukan pekerjaan atau aktiviti lain dengan kurang berhati-hati daripada biasa ○ 1 ○ 2

Dalam masa 4 minggu yang lalu, sejauh manakah kesihatan fizikal atau masalah emosi mengganggu aktiviti sosial biasa anda bersama keluarga, sahabat handai, jiran-tetangga atau kumpulan?

○ 1 – Tidak sama sekali

○ 2 – Sedikit

○ 3 – Sederhana

○ 4 – Agak banyak

○ 5 – Amat sangat

Dalam masa 4 minggu yang lalu, berapa banyakkah kesakitan yang dialami oleh anda?

○ 1 – Tiada

○ 2 – Sedikit sangat

○ 3 – Sedikit

○ 4 – Banyak

○ 5 – Agak banyak

○ 6 – Sungguh banyak

Dalam masa 4 minggu yang lalu, sejauh manakah kesakitan telah mengganggu pekerjaan

○ 1 – Tidak sama sekali

○ 2 – Sedikit

○ 3 – Sederhana

○ 4 – Agak banyak

○ 5 – Amat sangat

Soalan-soalan ini adalah mengenai perasaan dan keadaan anda dalam masa 4 minggu yang lalu. Untuk setiap soalan, sila berikan satu jawapan yang paling hampir dengan keadaan perasaan anda. Dalam masa 4 minggu yang lalu, berapa kerapkah…

	Setiap masa	Kebanyakan masa	Banyak masa	Kadang kala	Sedikit masa	Tiada sama sekali
Adakah anda merasa penuh bersemangat	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
Pernahkah anda merasa sungguh gementar??	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
Pernahkah anda merasa sungguh sedih hingga tiada apa pun yang dapat menceriakan anda?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
Pernahkah anda merasa tenang dan aman?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6

Adakah anda sungguh bertenaga?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
Pernahkah anda merasa sedih dan murung?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
Adakah anda merasa sangat letih?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
Pernahkah anda merasa gembira?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6
Adakah anda merasa letih?	○ 1	○ 2	○ 3	○ 4	○ 5	○ 6

Dalam masa 4 minggu yang lalu, berapa kerapkah kesihatan fizikal atau masalah emosi telah mengganggu aktiviti sosial anda (seperti melawat sahabat-handai, sanak-saudara, dll.)?

○ 1 – Setiap masa

○ 2 – Kebanyakan masa

○ 3 – Kadang-kala

○ 4 – Sedikit masa

○ 5 – Tiada sama sekali

Berapa BENAR atau SALAH <u>setiap</u> penyataan berikut untuk anda?

	Sungguh benar	Kebanyakan-nya benar	Tidak tahu	Kebanyakan-nya tidak benar	Sungguh tidak benar
Saya kelihatan lebih mudah jatuh sakit daripada orang lain	○ 1	○ 2	○ 3	○ 4	○ 5
Saya sihat seperti orang lain yang saya kenali	○ 1	○ 2	○ 3	○ 4	○ 5

Saya menjangkakan kesihatan saya akan menjadi lebih teruk	○ 1	○ 2	○ 3	○ 4	○ 5
Kesihatan saya adalah sungguh baik	○ 1	○ 2	○ 3	○ 4	○ 5

Bahagian F: "International Complementary and Alternative Medicine" (I-CAM-Q) disesuaikan untuk kajian dalam kalangan Pesakit Hipertensi Malaysia

Melawat penyedia penjagaan kesihatan: Keadaan kesihatan (tekanan darah tinggi) boleh dirawati oleh pelbagai pegawai kesihatan tradisional dan komplementari.

Dalam tempoh 12 bulan yang lepas, adakah anda melihat mana-mana penyedia penjagaan kesihatan yang berikut untuk rawatan dan pengurusan tekanan darah tinggi.			Bilangan kekerapan anda melawat penyedia ini dalam 3 bulan lepas	Adakah perjumpaan dengan penyedia tersebut berfaedah kepada anda? (Sila tandakan satu jawapan sahaja)			
	Ya	Tidak		Sangat Berfaedah	Agak Berfaedah	Tidak Berfaedah	Tidak Pasti

Doktor	☐	☐	_____	☐	☐	☐	☐
Chiropractor	☐	☐	_____	☐	☐	☐	☐
Penyedia Homeopath	☐	☐	_____	☐	☐	☐	☐
Penyedia Akupunktur	☐	☐	_____	☐	☐	☐	☐
Saudagar ubat herba	☐	☐	_____	☐	☐	☐	☐
Penyembuh rohani	☐	☐	_____	☐	☐	☐	☐
Penyedia perubatan Cina	☐	☐	_____	☐	☐	☐	☐
Penyedia perubatan Melayu	☐	☐	_____	☐	☐	☐	☐
Penyedia perubatan India	☐	☐	_____	☐	☐	☐	☐
Lain-lain: _____	☐	☐	_____	☐	☐	☐	☐
Lain-lain: _____ _	☐	☐	_____	☐	☐	☐	☐

Amalan Mengurus Tekanan Darah Tinggi dengan sendiri.

Adakah anda pernah menggunakan mana-mana daripada amalan berikut untuk menguruskan tekanan darah tinggi dalam tempoh **12 bulan** yang lepas?			Bilangan kekerapan anda mengamalkan amalan ini dalam tempoh **3 bulan** yang lepas	Adakah amalan tersebut berfaedah kepada anda dalam mengurus tekanan darah tinggi? .(Sila tandakan satu jawapan sahaja)			
	Ya	Tidak		Sangat Berfaedah	Agak Berfaedah	Tidak Berfaedah	Tidak Pasti

Siddha	☐	☐	_____	☐	☐	☐	☐
Yoga	☐	☐	_____	☐	☐	☐	☐
Qigong/ Tai Chi	☐	☐	_____	☐	☐	☐	☐
Meditasi	☐	☐	_____	☐	☐	☐	☐
Menghadiri upacara penyembuhan tradisional	☐	☐	_____	☐	☐	☐	☐
Berdoa untuk kesihatan sendiri	☐	☐	_____	☐	☐	☐	☐
Terapi Spa	☐	☐	_____	☐	☐	☐	☐
Terapi Warna	☐	☐	_____	☐	☐	☐	☐
Unani	☐	☐	_____	☐	☐	☐	☐
Reiki	☐	☐	_____	☐	☐	☐	☐
Phytobiophysics	☐	☐	_____	☐	☐	☐	☐
Pranayama	☐	☐	_____	☐	☐	☐	☐
Terapi kristal	☐	☐	_____	☐	☐	☐	☐
Lain-lain : _____ _	☐	☐	_____	☐	☐	☐	☐
Lain-lain: _____ _	☐	☐	_____	☐	☐	☐	☐

Penggunaan Perubatan Herba dan Suplemen tambahan, termasuk tablet, kapsul dan cecair.

Untuk setiap kategori berikut, sila nyatakan 3 jenis produk yang anda telah gunakan dalam tempoh **12 bulan** yang lepas.	Andakah anda menggunakan produk in sekarang?		Bilangan kekerapan anda menggunakan produk in dalam tempoh 3 bulan yang lepas	Adakah produk ini berfaedah kepada anda dalam mengurus tekanan darah tinggi? (sila tandakan satu jawapan sahaja)			
	Ya	Tidak		Sangat Berfaedah	Agak Berfaedah	Tidak Berfaedah	Tidak Pasti
Herba Mentah							
Sila rujuk bahagian G, soalan 1 higgna 4							
Perubatan Herba							
	☐	☐	_____	☐	☐	☐	☐
	☐	☐	_____	☐	☐	☐	☐
	☐	☐	_____	☐	☐	☐	☐
Vitamin, mineral atau Suplemen							
	☐	☐	_____	☐	☐	☐	☐
	☐	☐	_____	☐	☐	☐	☐
	☐	☐	_____	☐	☐	☐	☐

* Bagi peserta yang menggunakan herba mentah untuk rawatan tekanan darah tinggi, sila terusan ke Bahagian G soal selidik ini. Bagi peserta yang tidak menggunakan herba mentah sila teruskan ke Bahagian H

Bahagian G: Penggunaan Herba Mentah Untuk Pengurusan Tekanan Darah Tinggi

Sila lengkapkan jadual di bawah

Herba Mentah yang diambil dalam tempoh 12 bulan yang lepas	Bahagian herba yang digunakan	Cara penyediaan	Adakah anda menggunakan herba ini sekarang?	Untuk berapa lama anda telah mula menggunkan herba ini?	Bilangan kekerapan anda menggunakan herba ini dalam tempoh 3 bulan yang lepas	Adakah herba ini berfaedah kepada anda dalam mengurus tekanan darah tinggi? (sila tandakan satu jawapan sahaja)
			☐			○ Sangat berfaedah ○ Agak berfaedah ○ Tidak berfaedah ○ Tidak pasti
			☐			○ Sangat berfaedah ○ Agak berfaedah ○ Tidak berfaedah ○ Tidak pasti
			☐			○ Sangat berfaedah ○ Agak berfaedah ○ Tidak berfaedah ○ Tidak pasti
			☐			○ Sangat berfaedah ○ Agak berfaedah ○ Tidak berfaedah ○ Tidak pasti

			☐			○ Sangat berfaedah ○ Agak berfaedah ○ Tidak berfaedah ○ Tidak pasti

2. Adakah doktor anda sedar bahawa anda sedang mengambil herba mentah untuk mengurus tekanan darah tinggi?

○ Ya

○ Tidak (Sila berikan alasan anda:

_____

3. Apakah sebab anda mengambil herba mentah untuk mengurus tekanan darah tinggi? (Anda boleh memilih **lebih daripada satu** jawapan)

○ Kepercayaan tradisional mengenai keberkesanan herba mentah

○ Tidak puas hati dengan perubatan konvensional (diberi oleh klinik/hospital)

○ Mudah diperolehi

○ Sebab budaya

○ Kepercayaan agama

○ Bimbang terhadap kesan-kesan sampingan perubatan konvensional

○ Lain-lain (Sila nyatakan): _____

4. Dari manakah anda mendapat maklumat mengenai pengunaan herba mentah untuk pengurusan tekanan darah tinggi? (Anda boleh memilih **lebih daripada satu** jawapan)

○ Buku/Majalah

○ Surat Khabar

○ Televisyen

○ Laman Web Internet

○ Ahli Farmasi

○ Doktor

○ Kerani stor/ jurujual

○ Pakar perubatan tradisional Cina/Melayu/India

○ Kawan atau jiran

○ Keluarga atau saudara-mara

○ Lain-lain (sila nyatakan:_____)

Bahagian H: Indeks Jisim Tubuh (BMI) dan Ukuran Tekanan Darah

Indeks Jisim Tubuh

Tinggi : _____cm

Berat : _____kg

BMI : _____

Tekanan Darah Arteri : _____

APPENDIX F

ETHICAL APPROVAL (KK KAMPAR)

UNIVERSITI TUNKU ABDUL RAHMAN
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Pegawai Kesihatan Daerah,
Pejabat Kesihatan Daerah Kampar,
Jalan Dugong,
31900 Kampar.

18 September 2019

YBhg Dato'/Tuan/Puan/Dr,

Salam Sejahtera,

PERMOHONAN UNTUK MENJALANKAN KAJIAN PENYELIDIKAN IJAZAH SARJANA DI KLINIK KESIHATAN KAMPAR

Dengan segala hormatnya perkara di atas adalah dirujuk.

2. Saya ingin mengucapkan ribuan terima kasih kepada pihak YBhg Dato'/Tuan/Puan/Dr atas kebenaran yang diberikan kepada kami untuk menjalankan kajian penyelidikan sarjana muda di Klinik Kesihatan Kampar selama dua tahun yang lepas (2018 -2019). Di sini, kami ingin memohon agar pihak YB Dato'/Tuan/Puan/Dr dapat membenarkan untuk menjalankan penyelidikan di peringkat ijazah sarjana pelajar ijazah sarjana (Master of Science, UTAR) di Klinik Kesihatan Kampar bermula dari tarikh 30/9/2019 hingga 30/6/2020.

3. Maklumat permohonan adalah seperti berikut:

Tajuk Kajian Penyelidikan : **Crude Herbs Integration Into Conventional Care and Its Effect on the Quality Of Life Among Patients With Hypertension**
Sampel kajian: **400**

Pegawai/pelajar yang terlibat dalam Kajian:

Nama:	IC	No Tel:	Emel:
Dr. Annaletchumy Loganathan	780318-08-5068	012-6979747	annal@utar.edu.my
Raphael Joe a/l Joachimdass	951216-14-5289	012-5475425	raphaeljoe1640@gmail.com
Abdul Rahman Bin Abdul Aziz	960130-56-5017	016-6506956	abdulrahman4351@gmail.com

4. Sehubungan dengan itu, kami akan rekruit pesakit yang sedang mengikuti rawatan penyakit darah tinggi. Kami amat berharap kerjasama daripada pihak doktor atau jururawat supaya dapat menolong kami untuk rekruit pesakit penyakit darah tinggi. Selepas mendapat pengiktirafan daripada doktor atau jururawat, pesakit yang setuju untuk mengambil bahagian sahaja akan direkruit dalam kajian ini. Pesakit-pesakit yang bersetuju akan kami temuduga sekali sahaja dengan mengunakan borang soal selidik.

5. Bersama-sama surat ini saya sertakan surat kebenaran untuk menjalankan penyelidikan dari National Medical Research Register (NMRR), surat lanjutan NMRR, Kementerian Kesihatan Malaysia dan surat kebenaran terdahulu daripada KKK, untuk rujukan Tuan/Puan.

Kajian dilaksanakan.

PKD	FMS	MO	PJK
			PPP
JTMP	PKD KAMPAR		PPKP
JURU X-RAY	FISIO / OT	PSP / PTM	PT N22 / W22

Address: 9, Jalan Bersatu 13/4, 46200 Petaling Jaya, Selangor Darul Ehsan, Malaysia **Postal Address:** P O Box 11384, 50744 Kuala Lumpur, Malaysia
Tel: (603) 7958 2628 **Fax:** (603) 7956 1923 **Homepage:** http://www.utar.edu.my

APPENDIX G

ETHICAL APPROVAL (UTAR SERC)

UNIVERSITI TUNKU ABDUL RAHMAN
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/207/2019

17 October 2019

Dr Annaletchumy Loganathan
Department of Allied Health Sciences
Faculty of Science
Universiti Tunku Abdul Rahman
Jalan Universiti
Bandar Baru Barat
31900 Kampar, Perak

Dear Dr Annaletchumy,

Ethical Approval For Research Project/Protocol

We refer to your application for ethical approval for your research project (Master student's project) and are pleased to inform you that your application has been approved under expedited review.

The details of your research project are as follows:

Research Title	Crude Herbs Integration Among Malaysian Patients with Hypertension
Investigator(s)	Dr Annaletchumy Loganathan Dr Afzaninawati Suria Bt Yusof (Kampar District Health Office) Raphael Joe a/l Joachimdass (UTAR Postgraduate Student)
Research Area	Science
Research Location	Klinik Kesihatan Kampar, Klinik Kesihatan Greentown, Ipoh
No of Participants	354 participants (Age: 18 and above)
Research Costs	Self-funded
Approval Validity	17 October 2019 - 16 October 2020

The conduct of this research is subject to the following:

(1) The participants' informed consent be obtained prior to the commencement of the research.

(2) Confidentiality of participants' personal data must be maintained; and

(3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.

Kampar Campus : Jalan Universiti, Bandar Baru, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 **Fax:** (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 **Fax:** (603) 9019 8868
Website: www.utar.edu.my

Should you collect personal data of participants in your study, please have the participants in the research signed the attached Personal Data Protection Statement for your records?

The University wishes you all the best in your research.

Thank you.

Yours sincerely,

Professor Ts Dr Faidz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Science
Director, Institute of Postgraduate Studies and Research

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
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Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 **Fax:** (603) 9019 8868
Website: www.utar.edu.my

APPENDIX H

ETHICAL APPROVAL NMRR

JAWATANKUASA ETIKA & PENYELIDIKAN PERUBATAN
(Medical Research & Ethics Committee)
KEMENTERIAN KESIHATAN MALAYSIA
d/a Kompleks Institut Kesihatan Negara
Blok A, No 1, Jalan Setia Murni U13/52,
Seksyen U13, Bandar Setia Alam,
40170 Shah Alam, Selangor.
Tel: 03-3362 8888/8205/8100

Ruj.Kami: KKM/NIHSEC/ P18-386 (7)
Tarikh: 04-March-2019

DR ANNALETCHUMY A/P LOGANATHAN
TUNKU ABDUL RAHMAN UNIVERSITY COLLEGE - PERAK CAMPUS

Dato'/ Tuan/ Puan,

Annual Ethical Renewal for 2019

NMRR-17-2591-38273 (IIR)
Protocol No :
The prevalence and factors associated with crude herbs use among patients with chronic diseases: A cross-sectional survey in combination with laboratory analysis.

With reference to the 'Continuing Review Form' submitted 25-February-2019, we are pleased to inform that the conduct of the above study has been granted approval (via Expedited Review by Chairperson) for a year by the Medical Research & Ethics Comittee, Ministry of Health Malaysia. Please note that the approval is valid until 03-March-2020. To renew the approval, a completed 'Continuing Review Form' has to be submitted to MREC **within 2 months** before the expiry of the approval.

The Medical Research & Ethics Committee, Ministry of Health Malaysia operates in accordance to The International Council for Harmonization of Technical Requirement for Pharmaceutical for Human Use (ICH) dan Malaysia Guidelines for Good Clinical Practice.

Comments (if any): NIL

"BERKHIDMAT UNTUK NEGARA"

Yours sincerely,

(DR HJH SALINA ABDUL AZIZ)
Chairman
Medical Research & Ethics Committee
Ministry of Health Malaysia

HM/Annualrenewal2018/Mrecshare

APPENDIX I

INTERVIEW GUIDE

Table A.7: Qualitative study interview guide

Questions (English/*Bahasa Melayu)*
1. Tell me about yourself. How is your current health condition, particularly blood pressure? (any changes, when did you last meet your doctor). *Pertama sekali, bagaimana keadaan kesihatan puan terutamanya dari segi bacaan darah tinggi… (ada apa-apa perubahan?)*
2. What kind of crude herbs have you taken in the past 12 months? (probe: name, self-plant/ any other sources, dose, daily prescription, preparation, effectiveness? beliefs? *Apakah jenis herba yang anda ambil dalam 12 bulan yang lepas.. (ingat tak nama herba tersebut, tanam sendiri ke, beli, berapa kali tuan/puan ambil, cara penyediaan, adakah anda percaya bahawa herba ini berkesan?*

3. What are some of the effects or impact of taking crude herbs while on medicine for high blood pressure? Probe: blood pressure levels, symptoms relief, daily activities, medicine taking routine

   Pada pendapat puan, apakah kesan atau impak sekiranya herba diambil sekali dengan ubat doktor

   a. Does it improve your blood pressure reading?

      Adakah ia mengurangkan tekanan darah anda?

   b. Have you noticed a reduction in symptoms such as headaches, dizziness, fatigue?

      Adakah simtom-simptom seperti sakit kepala, pening dan keletihan berkurang?

   c. Do you feel more energized and are able to perform more daily activities?

      Tuan/ puan rasa lebih bertenaga dan boleh melakukan aktiviti harian yang lebih banyak?

   d. How about herb-drug interactions. Are you aware of that possibility?

      Adakah anda sedar akan apa-apa interaksi antara herba dengan ubat yang diberi.

e. Do you tend to skip taking high blood pressure medication because you are taking crude herbs – you feel that you are taking herbs and may afford to skip taking medicine?

Sekiranya anda mengambil herba, adakah tuan/puan rasa keinginan untuk tidak mengambil ubat yang diberikan oleh doctor – seperti anda rasa, tidak apalah saya mengambil herba.. tidak perlu mengambil ubat doctor.

4. Who usually encourages you to take crude herbs? Probe: family/friends/relatives/doctors/shopkeeper, social media (whatsapp/facebook/Google search/youtube)

   Siapa biasanya menggalakkan anda untuk mengambil herba. Adakah ia keluarga, kawan, doktor, media social (Whatsapp, facebook, google, youtube)

5. In spite of information received, what has actually encouraged/influenced your action to use herbs. Probe: Why you couldn't continue taking the herbs for long term? Probe: How long on average each herbs?

   Selepas puan/tuan mendapat maklumat mengenai herba ini, apakah perkara yang menggalakkan penggunaan herba. Kenapa puan tidak sambung penggunaan herba untuk jangka masa yang panjang.

6. Do you discuss the use of crude herbs with your doctor? (what/why/when did you ask)

   Adakah anda memberitahu dan bincang dengan doktor mengenai penggunaan herba mentah? (apa/mengapa/bila anda tanya)

7. Other than crude herbs and doctor's medication, do you take other therapies? (what/ why) – supplemen, exercise, urut, yoga,

   Selain herba dan ubat doktor, adakah anda mengambil terapi yang lain (apa dan mengapa – supplemen, senaman, urut, yoga, silat, taichi)

   - If yes, what are those therapies and how effective are those therapies in your opinion?

     Kalau ya, adakah terapi tersebut berkesan pada pendapat anda?

   - If no, why?

     Kalau tidak, kenapa

8. What kind of information/need would you like to know/receive about crude herbs for managing high blood pressure or other chronic diseases? (what/ why/ how)

Biasanya sebelum tuan/puan ingin mengambil sejenis herba kan, adakah anda menginginkan maklumat yang sah berasaskan kajian saintifik untuk

memastikan herba tersebut betul-betul baik untuk mengatasi masalah tekanan darh tinggi ….

- If yes, in what form would you like to know about this information. (education talks or programs/ website/ mobile app/ advertisements/social media posts/youtube videos)?

  Jika ya, bagaimanakah anda ingin mendapat maklumat ini? Kempen ceramah, program, laman web khas, mobile app/ advertisemen, media social, video youtube?

- If no, why?

  Kalau tidak, kenapa?

9. Do you have any other comments which you would like to make?

   Tuan/puan ada pendapat lain untuk ditambah lagi tak

APPENDIX J

ADDITIONAL RESULTS FOR QUANTITATIVE STUDY

A.4 Two-way Cross-Sectional Analysis

Table A.4. Two-way Cross Sectional Analysis

Variables	Gender	Taking crude herbs						Chi-square, p-value
		No		Yes		Total		
		n	%	n	%	n	%	
Household Income								
No Income	Male	57	86.4	9	13.6	66	100	6.337, 0.012
	Female	78	69.6	34	30.4	112	100	
Less than RM 3000	Male	41	67.2	20	32.8	61	100	4.312, 0.038
	Female	17	45.9	20	54.1	37	100	
More than RM 3000	Male	8	61.5	5	38.5	13	100	0.004, 0.952
	Female	3	60.0	2	40.0	5	100	
Education Level								
No formal education or primary education	Male	45	83.3	9	16.7	54	100	1.283. 0.257
	Female	67	75.3	22	24.7	89	100	
Secondary education or higher	Male	61	70.9	25	29.1	86	100	8.397, 0.004
	Female	31	47.7	34	52.3	65	100	
Systolic Blood Pressure								
	Male	71	77.2	21	22.8	92	100	0.625, 0.429

<140 mmHg	Female	70	72.2	27	27.8	97	100	
≥140 mmHg	Male	35	72.9	13	27.1	48	100	6.147, 0.013
	Female	28	49.1	29	50.9	57	100	
Number of Comorbidities								
None	Male	28	90	3	9.7	31	100	0.780, 0.377
	Female	13	81.3	3	18.8	16	100	
One	Male	32	74.4	11	25.6	43	100	0.016, 0.900
	Female	31	75.6	21	25.4	41	100	
Two	Male	28	71.8	11	28.2	39	100	2.629, 0.105
	Female	24	54.5	20	45.5	44	100	
Three or more	Male	18	66.7	9	33.3	27	100	0.755, 0.385
	Female	30	56.6	23	43.4	53	100	
Having Falls								
No	Male	105	76.1	33	23.9	138	100	2.378, 0.123
	Female	90	67.7	43	32.3	133	100	
Yes	Male	1	50.0	1	50.0	2	100	0.109, 0.742
	Female	8	38.1	13	61.9	21	100	
Having Muscle Pain								
No	Male	98	79.7	25	20.3	123	100	7.294, 0.007
	Female	81	64.3	45	35.7	126	100	
Yes	Male	8	47.1	9	52.9	17	100	0.799, 0.371
	Female	17	60.7	11	39.3	28	100	
Race								
Malay	Male	35	64.8	19	35.2	54	100	6.734, 0.009
	Female	28	41.2	40	58.8	68	100	
Chinese	Male	57	86.4	9	13.6	66	100	4.762, 0.029
	Female	48	98.0	1	2.0	49	100	
Indian or others	Male	14	70.0	6	30.0	20	100	0.620, 0.431
	Female	22	59.5	15	40.5	37	100	

Race vs other variables								
Muscle Pain								
No	Malay	57	55.3	46	44.7	103	100	34.642, 0.000
	Chinese	95	91.3	9	8.7	104	100	
	Indian or others	27	64.3	15	35.7	42	100	
Yes	Malay	6	31.6	13	68.4	19	100	10.112, 0.006
	Chinese	10	90.9	1	9.1	11	100	
	Indian or others	9	60.0	6	40.0	15	100	
Education level								
No education or primary education	Malay	34	66.7	17	33.3	51	100	17.875, 0.000
	Chinese	62	93.9	4	6.1	66	100	
	Indian or others	16	61.5	10	38.5	26	100	
Secondary education or higher	Malay	29	40.8	42	59.2	71	100	39.086, 0.000
	Chinese	43	87.8	6	12.2	49	100	
	Indian or others	20	64.5	11	35.5	31	100	
Falls								
No	Malay	60	54.1	51	45.9	111	100	39.086, 0.000
	Chinese	104	91.2	10	8.8	114	100	
	Indian or others	31	67.4	15	32.6	46	100	
Yes	Malay	3	27.3	8	72.7	11	100	2.390, 0.303
	Chinese	1	100	0	0	1	100	
	Indian or others	5	45.5	6	54.5	31	100	
Systolic Blood Pressure								
<140 mmHg	Malay	46	62.2	28	37.8	74	100	19.972, 0.000
	Chinese	69	92.0	6	12.2	75	100	
	Indian or others	26	65.0	14	35.0	40	100	

≥140 mmHg	Malay	17	35.4	31	64.6	48	100	27.097, 0.000
	Chinese	36	90.0	4	10.0	40	100	
	Indian or others	10	58.8	7	41.2	17	100	
Number of comorbidities								
None	Malay	8	72.7	3	27.3	11	100	3.163, 0.206
	Chinese	28	93.3	2	6.7	30	100	
	Indian or others	5	83.3	1	16.7	6	100	
One	Malay	17	60.7	11	39.3	28	100	10.132, 0.006
	Chinese	40	88.9	5	11.1	45	100	
	Indian or others	6	54.5	5	45.5	11	100	
Two	Malay	22	46.8	25	53.2	47	100	15.174, 0.001
	Chinese	21	95.5	1	4.5	22	100	
	Indian or others	9	64.3	5	35.7	14	100	
Three or more	Malay	63	51.6	59	48.4	122	100	9.915, 0.007
	Chinese	105	91.3	10	8.7	115	100	
	Indian or others	36	63.2	21	36.8	57	100	
Monthly income								
No income	Malay	37	56.1	29	43.9	66	100	27.977, 0.000
	Chinese	74	93.7	5	6.3	79	100	
	Indian or others	24	72.7	9	27.3	33	100	
<RM3000	Malay	23	48.9	24	51.1	47	100	10.449, 0.005
	Chinese	25	83.3	5	16.7	30	100	
	Indian or others	10	47.6	11	52.4	21	100	
>RM3000	Malay	3	33.3	6	66.7	9	100	6.779, 0.034
	Chinese	6	100	0	0	6	100	

	Indian or others	2	66.7	1	33.3	3	100

A.5 Complementary and Alternative Medicine (CAM) practiced by Patient's

Table A.5 indicates the healthcare providers visited, self-help practices and use of herbal or dietary supplements for the management of hypertension. The most commonly visited healthcare provider was the Chinese medicine practitioner (n=14, 4.8%). Prayer (n=218, 74.1%) was the highest form of self-help practices reported by the patients. Herbal tea (n=29, 9.9%) was the most frequently used herbal medicine among the patients

Table A.5: Healthcare providers visited, self-help practices and use of herbal or dietary supplements in the past 12 months for the management of hypertension.

Form of CAM	Number of Participants		Perceived to be helpful	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Healthcare provider visited				
Chiropractor	3	1.0	0	0
Homeopath	2	0.7	2	100
Acupunturist	3	1.0	0	0
Herbalist	3	1.0	3	100

Chinese Medicine Practitioner	14	4.8	7	50
Malay Medicine Practitioner	4	1.4	3	75
Self-help Practices				
Yoga	1	0.3	1	100
Tai Chi	10	3.4	5	50.0
Meditation	2	0.7	2	100
Healing ceremony	2	0.7	2	100
Prayer	218	74.1	218	100
Silat	2	0.7	0	0
Malay Massage	11	3.7	4	36.4
Muay Thai	1	0.3	1	100
Herbal Medicine and Dietary Supplements Used				
Herbal Tea	29	9.9	8	27.6
Herbal Mixtures	12	4.1	8	66.7
Vitamin C	13	4.4	5	38.5
Vitamin B	3	1.0	2	66.7
Multivitamin	11	3.7	6	54.5
Omega 3	6	6.3	2	33.3
Cod liver oil	2	0.7	1	50

A.6 Health Complications Experienced by Patients reported to doctors

A total of 56 patients experienced side effects. The most common side effects which were reported to doctors were dizziness (n=7, 2.4%), edema (n=5, 1.7%), bloating (n=5, 1.7%) and vision problems (n=5, 1.7%).

Table A.6: Health complications experienced by patients

Health complications	Frequency	Percentage (%)
Back pain	3	1
Bloating	5	1.7
Breathing difficulty	2	0.7
Chest pain	2	0.7
Constipation	1	0.3
Dizziness	7	2.4
Dry Cough	3	1
Dry mouth	1	0.3
Edema	5	1.7
Frequent Urination	2	0.7
Irregular heartbeat	1	0.3
Palpitations	4	1.4
Skin rash	1	0.3
Fatigue	1	0.3
Vision problems	5	1.7

APPENDIX K

LIST OF PUBLICATION AND PRESENTATIONS

Publication

Joachimdass, R. J., Subramaniam, K., Sit, N. W., Lim, Y. M., Teo, C. H., Ng, C. J., Yusof, A. S., and Loganathan, A., 2021. Self-management using crude herbs and the health-related quality of life among adult patients with hypertension living in a suburban setting of Malaysia. *PloS one*, *16*(9), e0257336. https://doi.org/10.1371/journal.pone.0257336

Presentations

1. 1st International Virtual Conference on Integrative Medicine 2021 (ICIM 2021) in conjunction with the 4th International Biohealth Science Conference

Joachimdass, R. J., Subramaniam, K., Loganathan, A., 2021. Can herbal remedies be integrated into allopathic medicine? Evidence from randomized controlled trials conducted among hypertensive patients. Journal of Complementary and Integrative Medicine, 18(4): S46. DOI 10.1515/jcim-2021-2121.

2. UTAR ICP and R&D Colloquium

Self-management using Crude Herbs and the Health-related Quality of Life among Adult Patients with Hypertension Living in a Suburban Setting of Malaysia