CHAPTER 2 :LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literatures highlighting the contents such as cupping therapy from different perspectives, cupping practice guideline in Malaysia, adherence to cupping practice guideline, knowledge, attitude, and factors associated with it. This literature review identifies knowledge gaps in relation to cupping practice for future improvement.

2.2 Types of Cupping Therapy Available Worldwide (Middle East, Europe, Asia)

Cupping therapy is a therapeutic treatment that uses small glass, plastic or bamboo cups that act as suction devices with negative pressure on the intact or scarified skin in order to withdraw blood and interstitial fluid filled with causative pathological substances (Cao et al., 2010; Moustafa Abou-El-Naga, 2013). It is a traditional medicine practiced by many nations across the globe and has been known to be an effective, economic and time saving therapy. This therapy is commonly used in Middle Eastern countries, European countries, and Asian specifically China, where it has been officially practiced in hospital setting together with modern medicine (Moustafa Abou-El-Naga, 2013).

2.2.1 Middle Eastern Countries

In Middle Eastern countries, cupping therapy is well-known as Hijamah. In Arabic, Hijamah means to return to the original state (El Sayed et al., 2013), and in this context by removing toxic blood from the body (Qureshi et al., 2017). Hence, wet cupping is mostly conducted in these countries, where it involves puncturing the skin before the suction takes place and blood is removed from the person's body during the procedure. Cupping is a prevalent therapy in Muslim societies as part of prophetic medicine, which means the treatments are directly recommended by the prophet (Khalil, Al-Eidi, et al., 2018).

Sunnah means the way, method, or style of life. Prophetic sunnah is the well-documented knowledge gained from hadeeths (sayings), deeds, advices and teachings in all aspects of life related to prophet Muhammad peace be upon him (Loukas et al., 2010). Prophetic medicine is the medical aspect of prophetic sunnah, and it is related to health advice, preventive aspects, and treatment of diseases. Prophetic medicine (related to Prophet Muhammad peace upon him) recommends hijamah for treating many diseases. "Healing is in three things: a gulp of honey, cupping and cauterization, but cauterization should be a last resort" (Loukas et al., 2010). Prophet (SAW) and his companions always had practiced cupping in several occasions, from the time he was at home and that he was in the state of Ihram (Deuraseh, 2006). On several occasions, he was cupped on his head. Once, the Prophet (peace be upon Him) said "Hijama is the most helpful procedure for human beings to cure themselves" (Deuraseh, 2006). Nowadays, hijamah is not only used as treatment of disease but also as a preventive medicine.

2.2.2 European Countries

Cupping has gained its popularity and underwent a surge in the fourteenth century and during this time it was used generally for gout (Manson, 1854). Previously, it was noted that a doctor had using dry cupping to relieve pain and facilitate delivery during a tough labor (Gubb, 1923). Dry cupping involves the application of a heated cup that act as suction on the skin for several minutes, mainly to reduce pain. Cupping was popular in France in the 1920s where it has been regarded as the universal remedy for aches and pains or shortness of breath (Dearlove et al., 1982).

In one of the case, prior review stated that cupping as a treatment of pneumonia in French Hospital, where fire has been used as a suction method, before bleeding using wet cupping (Chirali, 2014). Although nowadays this therapy is not practice in the official medical system, it is still being available and practiced in some parts of Europe.

2.2.3 Asia

Cupping therapy in China is well known as 'Baguan' (bá guàn liáo fǎ). Conferring to Chinese term, 'ba' is to pull out and 'guan' refers to jar or cup (Nielsen et al., 2012). Thus, Baguan is the technique of suction from the skin through cup. Among the Chinese, cupping had been practiced from several thousand years ago. They were using the same types of cups which consists of glass and bamboo, mainly to produce hyperemia at acupuncture points or painful area with the purpose of curing the diseases or reducing symptoms. There are seven major types of Chinese cupping; namely flame cupping, wet/ bleeding cupping, moving cupping, retained cupping, empty cupping, needle cupping and herbal/ medicinal cupping (Cao et al., 2010). Flame

or fire cupping requires soaking a cotton ball in alcohol, which clamped by a forceps and lit it using lighter before placing it into the cup and quickly put the cup on the skin. The fire consumes the oxygen in the cup and creates a negative pressure that functions to suck the skin when doing cupping. Moving cupping is where it involves oil on body, allowing the cups to move and massage the muscles during treatment (Yu et al., 2011). In retained cupping, the cups are retained on skin for 5-15 min (Lin et al., 2018), meanwhile empty cupping involves instant repeated application of cups, with minimal retention. Needle cupping on the other hand is with needle retention, involving both acupuncture and cupping treatment (Lin et al., 2018). Herbal/ medicinal cupping utilize bamboo cup where the herbs are boiled as aqueous dispersion before being cupped on skin (Mehta & Dhapte, 2015). The basic principles of Chinese medicine is based on the concept of 'ying and yang', wu-shing and Qi (or chi) (Aboushanab & AlSanad, 2018). By balancing the yin ang yang able to help body in increasing blood flow, reducing pain and eventually increasing resistance to pathogens. Since 1950s, cupping had been practiced officially by clinicians as therapeutic preventions in hospitals of China (Cao et al., 2012).

2.3 Brief Description of Cupping Therapy Technique

There are various types of cupping, mainly dry and wet cupping (Mahmoud, 2013). In dry cupping, cups are placed on intact skin and the purpose is to remove blood and fluid from the site of inflammation to the surface of the skin. Meanwhile, in wet cupping there are few small superficial scarifications, about 0.1 mm in depth just to open skin barrier using a lancet and it covers only the cupped area skin. The purpose is

to excrete superficial blood with soluble waste and causative pathological substances (Mahmoud HS, 2013). Puncturing must be superficial, sequential, only a few, and short about 2 mm with benign movement (Moustafa Abou-El-Naga, 2013).

Cupping is performed by creating a vacuum in the cup placed on the skin by either applying a heated cup on the skin which consumes the air within it (fire cupping) or by using a suction pump (suction cupping). In fire cupping the practitioner may use a cup made of glass, metal, or wood (bamboo). The cups are then heated by burning alcohol-soaked cotton within the cups. The cup is then placed faced down flat on the skin as the heat creates suction on the skin. Whereas suction cupping uses a suction pump to pump the air out of the cup when applied onto the skin (Mehta & Dhapte, 2015).

Bloodshed during cupping therapy is coming from the capillary, that may help in enhancing capillary microcirculation, removing metabolic byproducts, and relieving congested capillaries. The negative vacuum suction stimulates the mobilization of interstitial tissue fluids in nearby areas to drain in and refill the cupped area. Consequently, cupping helps in increasing blood flow to affected areas, relaxing the muscles, and reducing overall inflammation, as well as stimulating immune system (Moustafa Abou-El-Naga, 2013).

2.4 Cupping Practice in Malaysia

Cupping therapy continues to be an important presence in Malaysia as it has made some implications on healthcare system. In the latest National Health Morbidity Survey (NHMS) (2015), 29.25% of Malaysian population had ever used any traditional

and complimentary medicine practices with consultation and Malay cupping which comprised of 6.45% was ranked in top five most preferred practices, with higher prevalence of cupping practice among urban residents at 82.98% as compared to rural residents at 17.02% (Institute for Public Health, 2015). There is also Chinese cupping under Traditional Chinese Medicine which contributed about 2.28% overall practices. Female showed significantly higher proportion of cupping practice as compared to male. A prior study on the types of traditional & complimentary medicine (T&CM) used by Malay patients visiting a T&CM center in Malaysia revealed that 31.7% had chosen cupping therapy as the mode of treatment (Othman & Farooqui, 2013). This data explains cupping therapy is still on demand and it is very much ingrained in our multiracial Malaysian community. There is a need to continue providing traditional and complimentary medicine, specifically cupping therapy in providing options for patients and community to maintain wellness in supplementary to modern medicine. With regards to the location of cupping services, it is provided at either practitioner's premise or patient's house. Majority of Malay cupping users go for cupping to maintain wellness (66%), to treat illnesses (13%) and 21% of them mentioned for both as treatment and to preserve wellness (Institute for Public Health, 2015). In terms of places where the cupping services were obtained, majority of the respondents had their cupping therapy at practitioner's house (37%), followed by at premise (31%) and patient's own house (19%).

Speaking about T&CM practitioners, to date, there are 16,050 of local practitioners have registered with Ministry of Health (MOH) so far (Traditional & Complementary Medicine Division, 2018). However, it is believed that a lot of unregistered practitioners are still practicing in the market. A huge number of

unregistered practitioners might be due to many of them did not possess proper qualifications and credentials as TCM practitioners ("Registration of TCM practitioners mandatory by year-end," 2016). Any person intended to practice TCM must apply to the council to be provisionally registered as a practitioner by undergoing one year residency in any institution recognized by TCM council. Only those who meet the qualifications will be issued a practicing certificate. Meanwhile, based on database gathered by MOH, roughly 13,000 premises are giving T&CM services including cupping therapy. Nevertheless, official figures on the exact number of cupping practitioners in Malaysia are not available.

2.5 Diseases Treated by Cupping

Prophet Muhammad (peace be upon Him) had reported to get cupped for headache and had recommended a man who complained about pain in the head to get cupped (Tabachnick, 2020). This is supported by prior study of wet cupping conducted among migraine patients showed significant improve in quality of life without side effects (Kaki et al., 2019). In a systematic review on the benefits of cupping practice among Chinese traditional and complimentary medicine, cupping is used to treat conditions such as herpes zoster, cough, asthma, acne, common cold, urticaria, neuritis, cervical spondylitis, lumbar sprain, mastitis, facial paralysis, headache, soft tissue injury, arthritis, neurodermatitis, sinusitis and sciatica (Cao et al., 2010). In other systematic review study conducted in 2011, cupping has been claimed to reduce pain including musculoskeletal pain, stimulate autonomic and peripheral nervous system, reduce hypertension and treat herpes zoster (Lee et al., 2011).

Many theories have been suggested to explain various effects of cupping therapy and its mechanisms of action. According to literature, pain reduction effects may results from changes in biomechanical properties of the skin as explained by the "Pain-Gate Theory", "Diffuse Noxious Inhibitory Controls", and "Reflex Zone Theory" (Al-Bedah et al., 2019). For the anti-inflammatory and increase blood circulation effect could be attributed to the "Nitric Oxide Theory". The immunomodulatory effects of cupping can be explained by the "Activation of Immune System Theory" and finally releasing of toxins and removal of wastes and heavy metals which exhibit hematological adjustment effect might be attributed to the "Blood Detoxification Theory" (Al-Bedah et al., 2019).

"Pain-Gate Theory" suggests that cupping therapy could reduce pain intensity by changing the communication routes of pain transmission from a stimulated area to the brain and backward, involving nociceptive nerve fibers to synapse into a transmission cell in the dorsal horn of the spinal cord. In "Diffuse Noxious Inhibitory Controls Theory", it is based on the concept of pain inhibits pain. Local scratching and puncturing done during cupping therapy triggers the spinal-medullary-spinal pathway resulting from when two concomitant painful stimuli applied at the same time causes inhibition of the primary pain (Al-Shidhani & Al-Mahrezi, 2020). "Reflex Zone Theory" explains about the connection between one organ of the body and another one due to the interaction between nerves and muscles. The disruption in one organ causes external symptoms which can be detected at a site distal to the affected organ. Thus, the application of cupping therapy cups on top of the skin causes the stimulation of the skin receptors which lead to the development of blood circulation through the neural connections to the affected organ.

Meanwhile nitric oxide as in “Nitric Oxide Theory” involves vasodilation and regulation of blood pressure, in addition to cell differentiation and other physiological functions. The application of cupping therapy might cause the release of nitric oxides from endothelial cells and, thus, increase blood circulation effects. “Activation of Immune System Theory” suggest that cupping therapy helps to decrease serum immunoglobulin E (IgE) and interleukin 2 (IL-2) levels which are found to be abnormal in the immune system. Cupping can affect the immune system via three pathways, and those are, firstly, cupping aggravates the immune system by making an artificial local inflammation. Secondly, cupping activates the complementary system and thirdly, cupping increases the level of immune products such as interferon and tumor necrotizing factor. Consequently, it increases the flow of lymph in the lymphatic system and activates immunological effects. Last but not least, in “Blood Detoxification Theory”, discussed on the removal of toxic substances such as uric acid, high density lipoprotein (HDL), low density lipoprotein (LDL), serum glutamic oxaloacetic transaminase and iron from the affected area where the cups are applied (Daniali et al., 2008). The negative pressure suction produced by cupping therapy trigger the extraction of the toxins generated by the oozing fluid, exudation, and germs (Al-Bedah et al., 2019).

2.6 Adverse Effect of Cupping due to Poor Practice

Although cupping therapy is considered safe with no major adverse effects, it is essential to ensure that practitioners are properly trained and aware on the possible risks involved. The procedure has a minimal discomfort due to the application of blade to

puncture the skin. In cases where the patient's pain threshold is low, a local anesthetic can be administered to reduce the discomfort. Cupping can cause painless swelling and bruising on the skin, which will be disappeared within a few days after treatment. Furthermore, other possible minor side effect that may occur is light headedness post cupping because blood has been drawn into the cups, and to tackle this the patient needs to be rested post procedure without handling any heavy machine or driving. In addition, in a systematic review of adverse effect of cupping conducted in Korea, found out that among the adverse effects reported were erythema multiforme, herpes simplex virus infection, anemia, factitial panniculitis, cervical epidural abscess and cardiac hypertrophy (Kim et al., 2014). In another study in Korea, cupping therapy were associated with infections, the exacerbation of symptoms, pneumothorax, and burns. Among the adverse events reported, which related to traditional Korean medicine, more than 40% of infections were attributed to the mismanagement of acupuncture or cupping therapy (Shin et al., 2013).

Furthermore, a randomized controlled trial conducted in a hospital in Jeddah, Saudi Arabia revealed that there were only mild side effects post cupping such as headaches, dizziness and tired, that subsided after few hours. After eight weeks follow up, only 27.8% of intervention group participants were having hyperpigmented scars at cupping sites (Aleyeidi et al., 2015).

A systematic review conducted by the Medical Development Division, Ministry of Health Malaysia stated that wet cupping is literally safe without serious adverse effects, nevertheless may include effects such as discomfort, tired, skin laceration, tension headaches, pain at the cupping sites, hematoma and most commonly bruises on

the skin. Though, these adverse effects are minor, transient, less severe and it will disappear in several days (MaHTAS, 2019).

Numerous adverse events related to cupping therapy were reported but were rare. Most of the effects were preventable if the practitioner is trained properly. Cupping should be administered by qualified health experts and in compliance with safety practice guidelines.

2.7 Traditional and Complimentary Medicine Practice Guideline on *Bekam* (Cupping) by MOH [2011]

Traditional & complementary medicine is now gradually recognized globally as a form of health care alongside mainstream health services and the demand for its services is on an upward trend. This is because according to National Health and Morbidity Survey in 2015, 29.25% of Malaysian population had ever used any traditional and complementary medicine practices with consultation and 21.51% of the population used traditional and complimentary medicine within the last twelve months with consultation. Among them, 6.45% used Malay cupping and they often used for minor illnesses such as myalgia, joint and muscle ache, back pain and cough (Institute for Public Health, 2015). Due to its high demand, government has taken the initiative to provide practice guideline as reference.

The T&CM Act 2016 (Act 775) provides for the establishment of the T&CM Council to regulate the T&CM services and matters related to it such as adhering to practice guideline. It is an effort to curb abuse by unscrupulous practitioners, in ensuring the safety and quality of the services provided. Although T&CM practices have begun

to be incorporated into the national health care system in selected public hospitals and clinics in Malaysia, the volume of T&CM practice lies in the private sector. This guideline serves to ensure the safety and quality of T&CM services including cupping. It helps practitioners in providing them with relevant information and responsibilities related to the care of T&CM services. According to T&CM Act 2016, any practitioner who desires to practice and provide T&CM services should register with T&CM Council. In order to be eligible for registration, the practitioners need to have the required qualifications. Unqualified practitioners may provide inadequate services and may not follow the professional code of ethics. This guideline can be accessed in the official portal of Traditional & Complimentary Medicine Division Ministry of Heath Malaysia. The first English edition was published in 2011, followed by the Malay version in 2013 and is being used up to this point.

The guideline generally emphasis on safety training, in which it is imperative to avoid any transmission of various blood borne diseases such as Human immunodeficiency virus (HIV), hepatitis B and hepatitis C. The MOH practice guideline begins with the (1) definition and types of cupping available. Then followed by the (2) treatment criteria, which consists of the indications and contraindications of cupping therapy, recommended time to do cupping, precautions, and possible side effects and complications of cupping. In this guideline also explains about the (3) treatment procedures, which comprise of apparatus involved, points of applications, standard precautions, duration, how to monitor and the importance of referral if any emergency condition occurs. It also includes the need of (4) documentation and a proper (5) practice facility. In the appendices also provided with graphics on sterilization and disinfection techniques, standard precautions in healthcare, disposal of infectious

clinical waste, Environmental Quality Act 1974, cupping clerking from, consent form and cupping apparatus for easier understanding (Tradisional, 2013).

Knowledge components in the questionnaire were developed based on the contraindications, precautions, and side effects of cupping therapy sections in this guideline. This guideline has shown an extensive information about the indications of doing cupping such as for pain relief, as deep tissue massage, for menstrual pain, to relieve insomnia, in gastrointestinal disorders and others. It is also included contraindications for dry and wet cupping respectively, namely cancer patients, over varicose veins and lymph nodes, in patients with bone fracture or muscle spasm, sites of ulcers, in patients on anticoagulation or antiplatelet treatment such as aspirin, warfarin and heparin, and in patients with bleeding disorders such as hemophilia and thrombocytopenia. Meanwhile adherence components in the questionnaire were based on the section treatment procedures which include apparatus, where all cups should be sterilized after each session and lancets need to be sterile. Next section covered in the questionnaire is standard precaution. It is substantially explained that hands should be washed routinely, where images are also provided as reference. Practitioners are also required to use personal protective equipment especially gloves during cupping treatment. Subsequently, duration of time, where is it mentioned the cup should be applied for 10 to 15 minutes with the average of 10 cups to be applied per procedure. Next component in adherence questionnaire was monitoring, where in the guideline was clearly stated that patients should be monitored to see for any adverse events and a maximum allowable blood loss is 45o ml per procedure, hence cupping therapy need to stop and abandoned if there is an excessive bleeding. The other component covered in the questionnaire was information on referral, where it emphasized that emergency

medical services of 999 ought to be contacted immediately if there is any cardiorespiratory collapse event. Last but not least is the information on documentation. The cupping guideline has discussed deeply that practitioners need to document the estimated blood loss or withdrawn during wet cupping, for development of complications or adverse events, and consent form (Tradisional, 2013). The summary of the mapping between cupping practice guideline sections and questionnaire components for adherence and knowledge are as shown in Table 2.1.

Table 2.1 Mapping of cupping practice guideline and adherence and knowledge questionnaire

Practice guideline components	**Questionnaire items**
Treatment criteria	
i. Accepted age	-
ii. Indications	Knowledge
iii. Contraindications	Knowledge
iv. Recommended time	-
v. Precautions	Knowledge/adherence
vi. Side effects and complications	Knowledge
Treatment procedures	
i. Apparatus	Adherence
ii. Points of application	-
iii. Standard precautions	Adherence
iv. Duration	Adherence
v. Monitoring	Adherence
vi. Referral	Adherence
Documentation	Adherence
Practice facilities	Treatment facilities
Appendices	
i. Sterilization and disinfection techniques	Adherence
ii. Standard precautions in healthcare	Adherence
iii. Disposal of infectious clinical waste	Adherence
iv. Environmental Quality Act 1974	-
v. Bekam clerking form	Adherence
vi. Consent form	Adherence
vii. Bekam apparatus	Adherence

2.7.1 Aseptic Technique: Components of Practice Guideline

In wet cupping, blood is withdrawn into a cup after skin being punctured and vacuumed, risking the practitioners to cross contamination, higher in those ungloved and unshielded face. Splashing or aerosolizing of the cup's contents may possibly happened if not handle with care (Nielsen et al., 2012). In recommended safety protocols available in practice guideline, the practitioners were suggested to wear gloves at all times when doing procedures, keep personal protective equipment (PPE) including face shield while disposing waste product, and wash cups as soon as possible to avoid drying of blood, followed by sterilization if intended to re-use (Tradisional, 2013). Moreover, any gauze or tissue paper contaminated with patient's blood or fluids need to be disposed in hazardous waste bag / clinical waste (Nielsen et al., 2012). An appropriate safety measures need to be implemented during cupping therapy to ensure the protection of both practitioners and patients and deliver a competent care with minimal infections rates.

The re-use of contaminated cups without sterilization can expose other patients with blood borne diseases such as hepatitis B and C virus, and HIV. This is in consistent with prior systematic review evidence, where there were viral infection post cupping reported, which was hepatitis B (Furuse et al., 2013). In addition, another case report from Korea indicated a herpes simplex virus infection occurred secondary to cupping therapy (Jung et al., 2011). As stated by Nielsen et al (2012), to prevent from contamination, the practitioners were recommended to don glove when removing cups containing blood and to sterilize cups prior to re-use. Nevertheless, cupping glass have been misunderstood as non-critical instruments because they looked as if it only contacts with intact skin, especially in dry cupping. The fact is the contact might cause

extravasation and leaking of blood and body fluids into the cup even if not closely visible. According to the Centre for Disease Control (CDC), cups for wet cupping should be categorized under critical items, in which require sterilization or high level of disinfectant prior to re-use or safe disposal after used (Rutala et al., 2008). Although this standard has been proposed to be incorporated in complimentary medicines but the application is not covered by all practitioners (Rutala et al., 2008). Another issue arises, whether plastic cup will be in a good condition after repeated autoclaving, where it is best to be single used (Nielsen et al., 2012).

The needle or lancet used to puncture the skin especially in wet cupping should not be reusable and if intended to re-use it is best to sterilize the needle to prevent from any cross infections. In previous study, the main source of infection noted to be hepatitis and it was due to the reusable of needle without proper cleaning (Xu et al., 2013).

Besides, the skin needs to be cleansed with 70% isopropyl alcohol and allow it to dry before pricking it for wet cupping therapy. This disinfection is to prevent any infections caused by bacteria on the skin being injected with the tissues. Also, all clinical waste management need to adhere to the guidelines stipulated by Ministry of Health. This also incorporate disposable sharps such as needles and lancets. As according to the guideline, sharps need to be discarded into sharp containers and it should not be more than two-thirds full before disposal.

Standardizing safety practices among cupping practitioners in Malaysia able to downsize the risk of infections and protect the patients to the greatest extent. In conclusion, cupping therapy is not adverse effect-free, and several recommendations need to be emphasized to minimize the risk. It is recommended to start with the knowledge of the practitioners, in which they need to have adequate training in

anatomy, physiology and safety measures. Also, aseptic techniques and safety guidelines need to be implemented by enforcing the law to promote the safety and protect patients from having any adverse effects.

2.8 Adherence to Cupping Practice Guideline

Adherence can be explained as someone complying or behaving exactly according to a regime, advice, or belief. Also, binding oneself to observance (Bissonnette, 2008). Adherence to practice guideline is regularly used as a measure of quality of care as this is one of the indicators to attain excellent decision making in practice and utterly will deliver the best outcome to the patients. As there are paucity of literatures indicating level of adherence to cupping practice guideline among cupping practitioners especially in Malaysia, adherence to standard precautions guidelines among healthcare workers or traditional Chinese/ complementary practice guidelines among traditional medicines practitioners were included as they have a comparable job scope and workplace setting. The most comparable supported literature was a prior study conducted among licensed Chinese Medicine doctors in 37 hospitals in China exposed that adherence to practice guideline was 50% (Liu et al., 2017). In this study, adherence questionnaire was used a 4-point (1 = very poor to 4 = very good) scale to rate the magnitude of agreement with the statements. Perceived adherence is classified based on scores >50% of the maximum score. On another note, previous systematic review on sustainability of adherence to practice guideline in medical care, it was discovered that only 7 out of 18 evaluations were sustained in the long term (Ament et

al., 2015). It shows only 39% managed to sustain the adherence towards practice guideline in the long run.

Additionally, in another review depicted that noncompliance was higher at 70% occurred in all majority of clinical settings (Barth et al., 2016). Also, previous study conducted among general practitioners stated that 35% of the respondents had difficulties in changing routine and habits to follow guideline (Lugtenberg et al., 2011).

Good adherence to practice guideline has been noted to have a wide range of percentage, starting from the lowest to highest. In prior study conducted to measure compliance towards standard precautions among healthcare workers in India depicted that it was poor, reported at 11% (Kermode et al., 2005). The questionnaire used has 12 items, with 5-point Likert scale (never, rarely, sometimes, often, or always). Good compliant is quantified if the respondents reported 'often' or 'always' for all 12 items. The compliance discussed in the study were handwashing, waste disposal, use of eye protection and recapping needles. Another low proportion of adherence was from a previous study conducted among healthcare workers in Northwest Ethiopia, depicted that the adherence to standard precautions was at 12% (Haile et al., 2017). In this study, adherence was measured using a questionnaire consisted of 22 items at 3-point Likert scale (1 = seldom, 2 = sometimes, and 3 = always). Upon summation of 22 items, participants who had scored a cut-off point of 66 were considered as "compliant" with standard precautions. Noncompliance are those who reported they were 'sometimes' and 'seldom' on the compliant statements.

Furthermore, a prior study to measure adherence to infection prevention among medical centre in Ethiopia revealed that the overall adherence was 61% (Bekele et al., 2018). The items in the questionnaire were rated according to 3 Likert scale, namely

'always', 'sometimes' and 'never'. In this study, good practice is defined as the total score of more than the mean value.

Another study performed among healthcare workers in Northern Uganda, on compliance to Covid-19 infection prevention and control measures, it was noted the compliance was 68% (Amanya & Nyeko, 2020). The compliance was measured by 8 questions and scored as follows: 1, for 'never'; 2, for 'rarely'; 3, for 'sometimes'; and 4 for 'always', giving a total score of 32 points. Adequate compliance was established at ≥75% of the maximum score.

Nevertheless, a prior study conducted among dental healthcare workers in Saudi Arabia revealed that compliance to infection control standard precautions guideline was good, at 90.1% (Haridi et al., 2016). The compliance was assessed based on 4-point Likert scale: 1 = 'never'; 2 = 'rarely'; 3 = 'sometimes'; and 4 = 'always'. The minimum score was 0 and the maximum was 28. Good compliance is determined by the correct response percentage at 75% or more from the total score. Thus, adherence to practice guideline among various healthcare practitioners globally were varies, with minimal number of literatures discussing about cupping practice guideline.

2.9 Knowledge on Cupping

Knowledge is the facts, theoretical and practical understanding about something. In this study, the researcher would like to determine knowledge on cupping which comprises of the precautions, contraindications, and side effects of cupping therapy. Improving the knowledge among cupping practitioners towards cupping procedure including infection prevention is paramount to reduce the burden of healthcare-

associated infections. Nevertheless, some cupping practitioners were having different levels of understanding, including to have controversial belief and conception. As supported by previous study conducted among cupping professionals involving physicians, physiotherapist and nurses who sought license for cupping practice in Kingdom of Saudi Arabia, among the commonest controversial concepts was cupping is effective in the treatment of all diseases at 31.5% (El-Olemy et al., 2017). Also, from the same study, 27% of respondents mentioned it is unnecessary to disinfect the cups before cupping and 16% stated that handwashing is not the crucial concept of infection control. A total of 13% of respondents mentioned cupping does not cause any transmission of diseases, and 14% revealed that it is possible to perform cupping anywhere in the body. However, there was no classification of good knowledge identified in this study. This study showed that there is still lacking in the concept of cupping treatment and training program is needed to enhance knowledge and rectify false belief about cupping therapy.

Moving on to the other literatures from different healthcare professionals conducted in Saudi Arabia to measure infection control knowledge, 38% of them were having good knowledge (Haridi et al., 2016). The maximum score of knowledge was 8 and to determine the classification of good knowledge, a correct response percentage need to 75% or more. On the other hand, higher proportion of good knowledge was noted in prior study conducted among nurses in Ethiopia, where the overall knowledge on infection prevention practice was 83% (Bekele et al., 2018). One of the knowledge components discussed in this study was on standard precaution, similar component as in cupping practice guideline. Knowledge score above the mean value was considered as having good knowledge. Additional study conducted at different hospital also in

Ethiopia showed similar results, where infection prevention knowledge was 84.7% (Desta et al., 2018). Ten knowledge questions about infection prevention were asked with two possible responses: yes and no. Those who has score above the mean value were considered knowledgeable.

There is evidence suggesting that knowledge is one of the factors linked with adherence to practice guideline. A previous study conducted among healthcare workers in Pakistan depicted that there was a significant association between knowledge and adherence to standard precaution guideline ($p<0.001$) (Ather et al., 2019; Quan et al., 2015). Finding shows that good knowledge positively affected compliance to practice guideline. Nevertheless, a contradictory finding was found suggested that there was no significant association between knowledge and adherence to standard precautions among nurses in Philippine ($p>0.05$) (Labrague et al., 2012). Also, prior study conducted among physicians in Iran discovered no significant correlation between knowledge and practice of standard precautions ($p>0.05$) (Askarian et al., 2007). Echoing also to previous study mentioned no significant association between level of knowledge and compliance to infection control practice (Russell et al., 2018). This might be due to the difference of knowledge are insufficient to determine the effect in compliance.

2.10 Attitude towards Practice Guideline

Attitude can be described as inclination or feeling, opinion or behavior about any specific topic (Altmann, 2008). As according to theory of planned behavior, attitude turn out to be one of the determinants of behavior implementation (Ajzen, 2012). Hence,

determination of cupping practitioners' attitude towards practice guidelines is an important initial step in improving guideline adherence levels.

Clinical practice guidelines intend to enhance the quality of patient care by providing specific recommendations in clinical practice through evidence-based medicine. Despite substantial efforts to promote the use of guideline, attitude of practitioners towards practice guideline plays an initial role. A prior study implemented among general practitioners in Netherland reported 97% agreed to the statement that guidelines are useful sources of advice (Lugtenberg et al., 2011). Furthermore, from the same study, 94% stated that they believed that guidelines are based on sound and sufficient evidence. Nevertheless, 35% of the participants had difficulty changing their routines and habits to follow the guidelines. Additionally, in another study conducted among Chinese medicine professionals in China revealed the attitude towards practice guideline as safe (92%), economic (84%), and effective (76%) (Liu et al., 2017).

Moving on to other healthcare professionals, a study to measure attitude to clinical practice guidelines among Korean private clinicians found out that 91% of responders agreed that general guidelines were useful tools for improving patient care and quality of care (Jeong et al., 2014). From the same study, 72% revealed that the guideline had changed their practice and it was user-friendly. Only 15% stated that guidelines are a challenge to physician autonomy. Furthermore, prior study implemented among hospital doctors in Oxford revealed that 77% had welcoming attitude towards guidelines, however 51% perceived the attitudes of their colleagues as being less favorable (Mansfield, 1995). Moderate and low attitude towards practice guideline also noted in different study conducted among general practitioners in United Kingdom against acupuncture guideline. 10 out of 17 (58.8%) respondents implied poor

trust in the guideline, and the rest were having high trust in guideline or neutral (Czarnawska-Iliev & Robinson, 2016). All in all, majority of the studies showed favorable attitudes towards clinical practice guideline.

Previous studies have mentioned about the association between attitude towards practice guideline and the adherence to it. Echoing finding from prior study among healthcare workers in Iran revealed that there was a significant correlation between attitude and practice to standard precaution (r =0.399, p = 0.029) (Askarian et al., 2007). Also, a study conducted in China indicated that in the structural equation model, attitude became one of the influential factors affected the practice (Quan et al., 2015). Moreover, in separate study depicted attitude was positively associated with compliance with infection control practices among nurses in United States (p<0.05) (Russell et al., 2018). This might be driven by self-protection against blood borne diseases and adverse events. Those who perceive a greater risk of infection will be more likely to adhere to the guideline and vice versa. Hence, many studies have found out that clinical practice guidelines are valuable educational tools, and if it is important to improve quality in practice, practitioners need to explicitly accept the guideline and have good attitude towards it.

2.11 Factors Influencing Adherence to Cupping Practice Guideline

There are several factors determined in prior literatures to be associated with adherence to practice guideline. Those are knowledge on cupping, attitude towards practice guideline, age, gender, education level, working experience, number of patients in a week, employment status, and cupping training. In addition, some barriers were

noted to be hindered guideline use, namely knowledge-related barriers, attitude-related barriers, and external barriers.

2.11.1 Sociodemographic characteristics

2.11.1.1 Age

There are multiple factors that influenced adherence to practice guideline. This includes practitioner's related factors such as sociodemographic characteristics, with age in one of them. It was highlighted in prior study conducted among healthcare workers measuring adherence to infection control guideline in Ethiopia, through multivariate analysis depicted that older age, ranged 31 and above was two times more likely to practice infection control than younger healthcare workers, aged 21–25 (AOR = 2.04,95%, CI = [1.279–4.5793]) (Desta et al., 2018). Also, in agreement with other study, this study has shown a significant positive correlation between age and compliance (p<0.01), noted in study conducted among healthcare providers in Jordan (Nofal et al., 2017). The possible explanation for this finding could be due to as the age progresses, year of experience would increase and thus improve the skills and practice adhering to guideline through time. However this finding is contradicted with different study, where it revealed that younger age with less than 40 years old being the predictor of good compliance to standard precaution guideline (OR, 0.23; 95% CI, 0.07–0.82; p = 0.023) (Haridi et al., 2016). Nevertheless, there was no significant association between age and adherence to practice guideline revealed in previous study conducted in Palestinian hospital (p = 0.220) (Ayed et al., 2015).

2.11.1.2 Gender

The next associated factor is gender. There was a difference in level of adherence to practice guideline between male and female as noted in prior study mentioned females were more likely to comply with infection control guidelines better than male respondents (Gammon & Gould, 2007). In addition, resonating finding from previous study conducted among nurses in Palestinian hospital to measure infection control practice revealed that females have significantly higher practice score as compared to males (p = 0.004) (Fashafsheh et al., 2015). This is also in consistent with previous study done in Ethiopia stated that female healthcare workers were two times more likely to comply with standard precaution (AOR [95% CI] 2.18 [1.12–4.23]) (Haile et al., 2017). Also, gender was found significantly associated with compliance to practice guideline in a study from Pakistan (p = 0.006) (Zeb et al., 2019). Majority of the studies stated that women were having better adherence than men. This could be due to the fact that women have a natural tendency to conform with the organizational rules and regulations most of the time. Furthermore, they also often being extra caution against any infections (Haile et al., 2017).

2.11.1.3 Education Level

The subsequent associated factor is education level. As according to Malaysian cupping practice guideline, a cupping practitioner should have a proper training and education because of invasive nature of the therapy, thus, to safeguard the safety of the patients. Being a cupping practitioner, require them to have at least six months of performing cupping procedure under supervision or comparable to 40 case

presentations (Tradisional, 2013). Ministry of health has decided for the practitioners to have either Diploma or Degree in relevant fields as requirement in the future. This is in consistent with previous study conducted among healthcare workers in Ethiopia where education level was significantly associated with practice of infection prevention. Healthcare workers with higher education level such as with master and above were four times more likely to practice infection prevention as compared to diploma holders (AOR = 4.15, 95%, CI = [1.381–7.41]). Meanwhile, healthcare providers with degree were two times more likely to practice the infection prevention as compared to diploma bearers (AOR= 1.959, 95%, CI = [1.970–4.685]) (Desta et al., 2018). Hence, identifying education level as one of the associated factors to practice guideline adherence is essential.

2.11.2 Work Characteristics

2.11.2.1 Working Experience

As in terms of working experience, lengthy of working exposure might inclined the practitioners to adhere to practice guideline. The possible explanation can be due to expanding exposure in cupping therapy will enhance their knowledge and skill and thus understand the basic principles and reasoning on the adherence to practice guideline (Desta et al., 2018). In prior study on compliance to infection control guideline among physician and nurses in Jordan revealed that there was a significant positive correlation between length of experience and compliance (r = 0.32, $p \leq 0.01$) (Nofal et al., 2017). However, several contradictory findings were found, stated that there was no significant association between years of experience and infection prevention compliance were

noted (p>0.05) (Desta et al., 2018; Fashafsheh et al., 2015). The finding also supported by another study depicted no association between working experience and adherence to practice guideline (Halm et al., 2000).

2.11.2.2 Number of Patients Treated in a Week

The next associated variable is number of patients coming for cupping treatment in a week. When practitioners are having numerous numbers of patients coming for treatment in a week, their adherence score is escalating. This is reflected in prior study revealed that practitioners with the surge of 10 patients per week would increase the adherence score by 3 points (Nofal et al., 2017). This finding is in coherent with another study conducted among Japanese healthcare providers on the compliance to infection control reported that those who treated more than 35 patients per day statistically had higher level of adherence (Tada et al., 2014). This might be due to the fact that practitioners with fewer patients visit per day consider practice guideline to be financial burden (Tada et al., 2014).

2.11.2.3 Employment Status

The following associated factor is employment status. As in this study, employment status is defined as either the practitioner working as full time or part time. A full-time practitioner works eight hours in one day or 40 hours in one week. Part-time practitioners on the other hand works in between 30% to 70% of that a fulltime practitioner (*Employment (Part-Time Employees) Regulations 2010,* 2010). In prior

study revealed that part time workers were positively correlated with productivity and adherence to organization ruling or guideline (Ierodiakonou & Stavrou, 2015). This might be due to reduce tiredness and stress among part timers, making them easily follow the rules. Nevertheless, part time workers in faculty reported to having less publications and outputs (Levine et al., 2010). In both circumstances, it is always expected to have cupping practitioners to fully adhere to practice guideline.

2.11.2.4 Cupping Training

Cupping training is a basic training course covering theory and hands-on practical of cupping procedure (Kim, 2017). Usually, in the training, there will be specific part to explain on the cupping practice guideline and the importance of adhering to it. A prior study conducted among physicians to measure factors affecting the use of guideline in Japan revealed that training and guideline-related education was associated with active use of practice guideline (OR1.7 [1.1–2.5]) (Sasaki et al., 2020). However, a conflicting finding revealed that there was no significant association between specialty training and adherence to practice guideline (p>0.05) (Halm et al., 2000).

At this point, compulsory cupping training curriculum with exit examination have not been adopted for new cupping apprentice in Malaysia. Rather, proper cupping training and Malaysian cupping guidelines are sporadically delivered only to those interested in the topic, through continuing medical education or activities undertaken by traditional and complimentary medicine societies (Traditional & Complementary Medicine Division, 2018). Earlier, School of Medical Sciences Universiti Sains Malaysia (USM) has offered one-off short course for cupping practitioners, namely

Diploma Eksekutif Keusahawanan Islam (Juru Bekam Klinikal) which has been conducted in 2014. This course is offered to practitioners who did not have formal education background but possessed vast experiences in cupping practice, with the minimum of two years' experience. This course has been conducted for 5 days and the contents include the apparatus, diseases that can be treated, and cupping procedure demonstration and practice.

In conclusion, it is crucial to study on the adherence to Malaysian cupping practice guideline among cupping practitioners in Malaysia as there is lacking in evidence to support. A change in human behavior such as in adherence occurs through the sequential processes composed of knowledge, attitude, and other intrapersonal characteristics such as age, gender, education level, working experience, number of patients coming for treatment in a week, employment status, and cupping training. Knowledge is the foundation of the attitude, and attitude provides the power for adherence or behavioral change. Obtaining additional knowledge does not directly improve behavior, but with knowledge and right attitude, people can overcome difficulties by translating what people know as in practice guideline into actions as such in adherence.

2.12 Barriers of Guideline Use

Cupping practitioner's adherence to practice guideline is critical to improve outcomes of the patients, as it assists in decision-making of healthcare intervention. Inability to adhere with the practice guidelines can be explained by numerous kinds of barriers. According to Cabana et al. (1999), based on the conceptual framework namely

the Clinical Practice Guidelines Framework for Improvement, the barriers can be classified into three major components namely knowledge-related barriers, attitude-related barriers, and external barriers. Factors restricting adherence through a cognitive component were called barriers affecting knowledge, across an affective component were considered as barriers affecting attitude, and through a restriction of practitioner's ability and surroundings were deemed as external barriers.

2.12.1 Knowledge-related Barriers

In knowledge-related barriers, it consists of lack of awareness and lack of familiarity of the guidelines. This is when practitioners were not aware on the existence of the guideline and even if they knew on the existence of it, however, some might not be familiar with its contents. In previous qualitative studies managed to revealed these barriers (Espeland & Baerheim, 2003) (Almazrou et al., 2020).

2.12.2 Attitude-related Barriers

In attitude-related barriers, lack of agreement theme was identified. Practitioners might not agree with the specific components or concept of the guideline in general (Cabana et al., 1999). Other elements included under attitude-related barriers were lack of self-efficacy, lack of outcome expectancy, and inertia of previous practice. In lack of self-efficacy, low of self-efficacy due to lack of confidence may lead to poor adherence. it is very much related to the believe that one can perform the procedure or guideline accordingly. Meanwhile in lack of outcome expectancy, if a practitioner believes that

by adhering to a guideline will not lead to an increased outcome, they will be less expected to adhere to it. As in inertia of previous practice, it is where the practitioners were unable to change their previous practice and not be motivated to change. A previous study disclosed that half of the practitioners were at precontemplation state and not ready to change (Main et al., 1995). A previous focus group discussion among healthcare providers in Spain found out that guideline limited their professional autonomy, hindering them from adhering to practice guidelines (Gené-Badia et al., 2016). They have the thoughts that guideline as a control mechanism in their professional procedures.

2.12.3 External Barriers

Meanwhile for external barrier, is the limitation of the practitioners from performing the guidelines due to patient itself, guidelines-related, or environment factors. Patient factors includes the severity of the ailments, age, patient preference, and patient compliance to prescribed treatment. Guideline factors might be due to the deprivation of content, feasibility of the guidelines and the contradictory existing guidelines. On the other hand, environmental factors explain about lack of time, lack in resources, and negative pressures from other healthcare professionals (Cabana et al., 1999). The external barriers identified are in coherent with previous studies indicated that the barriers include lack of time, resources, incentives, availability, and costs of treatment (Almazrou et al., 2020; Barth et al., 2016a; Espeland & Baerheim, 2003).

Espeland and Baerheim have revised the classification of barriers and mentioned the newly identified barriers included lack of expectancy that adherence to guidelines

will lead to desired healthcare process, emotional difficulty with adherence to guidelines, improper access to alternative healthcare services and pressure from healthcare providers and organizations (Espeland & Baerheim, 2003). It is imperative to identify the barriers of guideline use as it would be easier to prepare an intervention in the future to overcome the obstacles and enhance the guideline use. The summarization is mentioned in Table 2.2.

Table 2.2 Revised version of Cabana's Practice Guidelines Framework

Revised version of Cabana's Clinical Practice Guidelines Framework for Improvement proposed by Espeland and Baeheim Type of barriers	Healthcare professionals typically diverge from a guideline because they:
Knowledge-related barriers	
Lack of knowledge of the guidelines	Did not know (and do not already use) guidelines
Attitude/feeling-related barriers	
Lack of agreement with the guideline	Disagree with the guideline decision criteria
Lack of outcome expectancy	Believe following guidelines worsen or do not improve patient outcome
Lack of process expectancy	Believe guidelines worsen or do not improve healthcare process
Lack of feeling expectancy	Think it provokes difficult feelings
Lack of self-efficacy	Do not think they have the competence to follow the guidelines
Lack of motivation/inertia of previous practice	Are not motivated to follow guidelines or change habits
External barriers	
Guideline-related	Consider the guideline unclear or impractical to use
Patient-related	Perceive pressure from patients to diverge or because of patient characteristics
Setting-related	Think their practice setting makes them diverge due to:
• lack of time	• insufficient time to inform or negotiate with patients
• lack of other practice resources	• insufficient materials, staff or reimbursement
• increased costs	• increased costs if the guideline is followed
• increased malpractice liability	• risk of legal actions
• pressure in the healthcare system	• pressure from other healthcare providers/organizations
• improper access to healthcare services	• too easy/difficult to actual or alternative services.

2.13 GAPERA (*Gabungan Pertubuhan Pengamal Perubatan Melayu*)

The Federation of Malay Traditional Medicine Practitioners Malaysia (GAPERA) was established on 28 June 2010. GAPERA is one of the eight Practitioner Bodies appointed by the Ministry of Health Malaysia in the Traditional and Complementary Medicine Division (T&CMD). The objective of GAPERA is to assist the MOH in upgrading Malay Traditional Medicine intended to optimize patient care. The President and founder of this organization is Mr Adzhar Latiff, a Malay traditional practitioner. GAPERA is an umbrella body that liaises directly with Ministry of Health Malaysia, and it covers *Pertubuhan Perubatan Acu-Bekam Malaysia, Malaysian Malay Massage Association, Pahang Traditional Medicine Practitioners and Entrepreneurs Organization, Pahang Heritage Association, and Persatuan Silat Melayu Lok.* The treatments categorized under Malay Traditional Medicine are body massage, fracture massage, sprained massage, postpartum massage, stroke or stroke massage, cupping, and herbs. The principles of Malay traditional medicine are based on the teachings of Islam (Al-Quran and Sunnah Rasulullah). Any practice that is contrary to Islam is Haram and rejected such as the practice of magic and sorcery. GAPERA is actively organizing programme to improve good practice among the practitioners, including advocating them to voluntarily register themselves with T&CMD MOH before TCM Act 2016 is fully enforced in this country. The examples of webinar and programme that have been organized were *Taklimat Akta Perubatan Tradisional & Komplimentari* 775 and *Kembara Mahabbah Gaya Hidup Sihat Perubatan Melayu.*

2.14 Literature Map

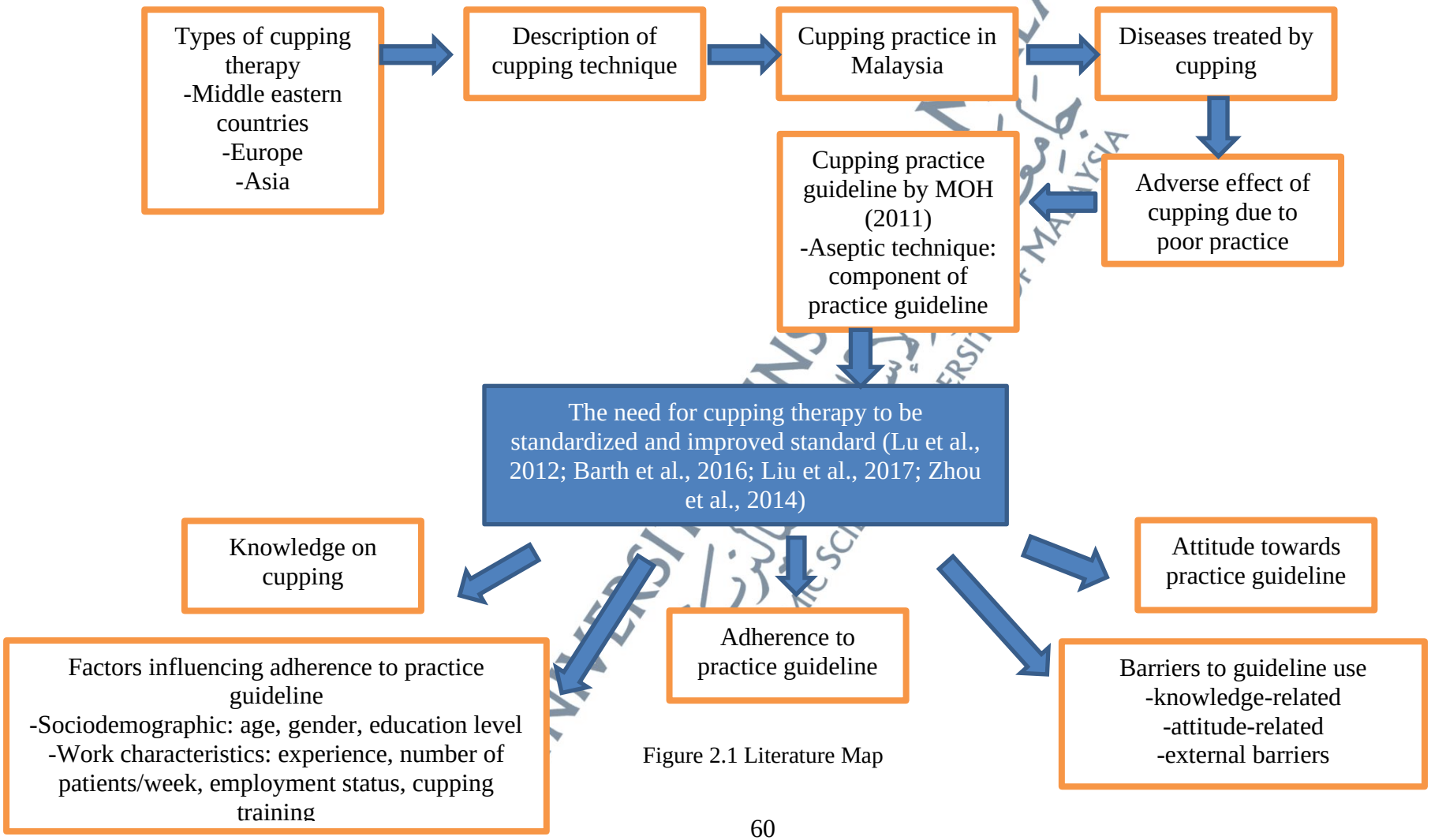

Figure 2.1 Literature Map

2.15 Conclusion

This chapter has discussed eloquently on the adherence to cupping practice guideline, knowledge on cupping, attitude towards practice guideline, and elucidation on factors associated with adherence to practice guideline. The methodology will be discussed in detail in next chapter.