



Patients' Knowledge Levels Towards Traditional Chinese Medicine: A Systematic Literature Review

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Abstract. Traditional Chinese Medicine (TCM) has become well-known and grasped attention not only among people around the world but also among policy makers and private agencies. Efforts have been made to incorporate TCM services into the country's healthcare system. However, the patients' knowledge levels of TCM remain poorly understood. Hence, this paper aims to identify the levels of knowledge among patients regarding TCM. Three databases, including SCOPUS, PubMed, and Google Scholar, were used to conduct article searches, yielding seven hundred and twelve studies. Eight studies were discovered through backward citation searching. Six relevant studies were selected based on the PRISMA flow diagram and guidelines. Studies were reviewed on type of literature, language, study design, and quality of the studies. These studies showed variability in patients' knowledge levels regarding TCM. Patients' knowledge levels towards TCM were also found to be influenced by previous involvement or experience, in which patients with previous experience tend to use TCM as compared to those who do not. Also, the source of knowledge information, such as from family and friends, were found to be crucial in influencing knowledge levels in TCM. However, other sources of information, such as the internet, healthcare professionals, and media, can also influence knowledge levels.

Keywords: Systematic Literature Review, Patient, Knowledge Levels, Traditional Chinese Medicine

1 Introduction

As one of the most famous applied health resources globally, traditional Chinese medicine (TCM) has a long history of being used for the treatment and prevention of diseases, as well as health maintenance [34]. Numerous conventional TCM treatments exist, including Chinese herbal medicine, dietetics, moxibustion, acupuncture, Taijiquan, Qigong, and Tuina [15]. TCM offers a unique and valuable contribution to the healthcare sector globally, complementing modern medicine techniques and enriching treatment alternatives [36]. A global survey conducted by WHO found that the most popular form of traditional and complementary medicine (T&CM) being used globally was acupuncture and it was recognized by 113 Member States of WHO while other

TCM practices were acknowledged by 100 Member States [33,34]. TCM was also included in the 11th International Classification of Diseases (ICD-11) which was implemented in 2022 to support the integration of evidence-based traditional medicine [35].

Even though TCM has an increasing global recognition, knowledge about TCM is still essential in addressing TCM misunderstandings and enhance TCM utilization. There is a significant gap in understanding patients' knowledge of TCM. According to Wilds [32], to achieve healthy outcomes, the patient must be aware of their health and treatment plan to fully adhere to, manage health, follow up, voice concerns, and ask any queries they have. Otherwise, patients with poor knowledge are at risk of complications of treatments [29]. Therefore, knowing about patients' knowledge levels and their preferences and views of medical treatment is important in encouraging integrated care [13].

Study by [21] showed that people with high knowledge will accept and utilize TCM due to the understanding of the positive effects. Moreover, an individual who can understand the risks and safety of the behavior they perform because of sufficient knowledge will have an impact on their behavioral intention [22]. These studies showed the essential of knowledge in TCM utilization. Furthermore, [18] emphasized on the importance of disseminating knowledge about the safety of utilization for enhancing overall life quality and health. Knowledge was recognized as crucial in making decision regarding treatment for diseases [8]. Nevertheless, based on the researcher's knowledge, there is a scarcity of studies focusing this area, particularly in identifying their patients' knowledge of TCM utilization.

The current study aims to contribute to this knowledge gap particularly by capturing key insights from the past literature and pointing out the directions for the future research on TCM knowledge. This review will specifically identify the key measurements of knowledge components, which will be useful in developing a standardized measurement tool for knowledge of TCM. Therefore, the purposes of this study include summarizing TCM knowledge studies, capturing the research status of TCM based on the keywords, analyzing the content of selected studies, and suggesting future research directions.

2 Materials and Methods

2.1 Systematic literature review methodology

In this section, the method used to retrieve studies related to patients' knowledge of TCM is discussed. The review has been registered under registration number CRD42024570070 in the International Prospective Register of Systematic Reviews (PROSPERO). This review was conducted on the principles in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline, which include the resources (Scopus, PubMed, and Google Scholar) used to conduct the systematic review and steps of the review process (identification, screening, and eligibility). Then, data extraction and analysis were carried out.

2.2 PRISMA Guideline

The present study is guided by the PRISMA review protocol as shown in Figure 1 [25]. PRISMA is used to guide researchers in transparently reporting the reason identified, methods, and the outcomes of systematic literature review [26]. The latest PRISMA 2020 guideline consists of 27 items [23]. Firstly, the research question was formed, and the inclusion and exclusion criteria were set for the review. The studies were searched from the databases by using the keywords in the review. Then, the system searching strategy including identification, screening, and eligibility was explained. After that, the studies selected underwent quality appraisal by using quality appraisal tools to make sure the studies selected are quality. Finally, the details on the data extracted from the studies, how the data extracted being analyzed, and discussion regarding the findings were explained as well.

2.3 Systematic Searching String

Identification. Literature search was performed using databases including SCOPUS, Google Scholar, and PubMed because these databases are commonly used in social science and health science field, provide comprehensive and relevant sources to the review. As in Table 1, the search terms were ‘patient’, ‘knowledge level’, ‘understanding level’, ‘traditional Chinese medicine’, and ‘Chinese medicine’. Boolean Operator ‘AND’ and ‘OR’ were used when performing searches. Seven hundred and twelve studies were discovered through databases searching process and eight studies through backward citation searching. After removing duplication, there are six hundred and eighty-seven studies from databases and eight studies from backward citation being retained for screening.

Table 1. The Search String

Database	Search String
Scopus	TITLE-ABS-KEY (("patient*") AND ("knowledge level" OR "understanding level") AND ("traditional Chinese medicine" OR "Chinese medicine"))
Google Scholar	"patient" "knowledge level" "understanding level" "traditional Chinese medicine" "Chinese medicine"
PubMed	(patient*[tiab]) AND ("knowledge level"[tiab] OR "understanding level"[tiab]) ("traditional Chinese medicine"[tiab] OR "Chinese medicine"[tiab])

Screening and Eligibility Checking. Screening of the title and abstracts of the studies were performed and those irrelevant were removed, leaving twenty studies. Then, the studies were retrieved for full-text accessibility. After removing the five studies where the full text was unable to be retrieved, the remaining fifteen studies underwent eligibility screening. The eligibility criteria were determined (See Table 2). Next, seven non-English studies were removed to avoid confusion and bias in translating the studies. Then, for the literature type, three studies that were not primary studies (systematic

literature review and meta-analysis) were removed. Additionally, two qualitative studies were removed in this review as the findings of the studies cannot be generalized to broader population and the remaining three studies fulfilled the eligibility of the review. Meanwhile, studies identified through backward citation searching were retrieved for full-text accessibility as well. After removing four studies where the full text was unable to be retrieved, the remaining four studies underwent eligibility screening. One qualitative study was removed and the remaining three studies fulfilled the eligibility of the study.

Table 2. Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Literature Type	Journal articles	Not primary studies
Language	English	Non-English
Studies Type	Quantitative studies	Qualitative studies
Quality Appraisal	Score high in AXIS* quality appraisal tools	Not score high in AXIS quality appraisal tools

* AXIS represents Appraisal tool for Cross-Sectional Studies

After that, two reviewers accessed the six studies. All studies are cross-sectional studies; hence, AXIS quality appraisal tools [6] were used to evaluate the studies' quality. This tool consists of 20 items related to the study's introduction, methods, results, discussion, and others such as funding and ethical approval or consent of participation. As mentioned by [24], the quality of the studies can be divided into high, moderate, and low. Only studies rated moderate and high will be included in the review [17]. Additionally, the study must be rated at least moderate and consented by the reviewers. Any disagreement between both the reviewers will be discussed until they reached mutual agreement to reduce bias and maintain priority on high-quality studies relevant to the current review. As result in Table 3, six studies were included as they were rated high quality by both the reviewers.

Table 3. AXIS Quality Appraisal Tool

Articles	Reviewer 1	Reviewer 2	Results
Article 1	High	High	Accepted for review
Article 2	High	High	Accepted for review
Article 3	High	High	Accepted for review
Article 4	High	High	Accepted for review
Article 5	High	High	Accepted for review
Article 6	High	High	Accepted for review

Record Included. Finally, studies which aligned with the objective were chosen. Six studies were chosen to be used in the write-out. The findings were read thoroughly to obtain useful information.

Data Extraction and Analysis. The details of the studies especially the abstracts, introduction, results, discussions, and conclusions were read thoroughly. Then, data extraction was conducted based on the research objective; it implies that any data obtained from the studies that could answer the research objective was extracted and recorded in a table. The researcher performed thematic analysis on the data obtained from the selected studies [3]. The developed themes were presented to two panels of experts in related field, who were asked to evaluate the themes subjectively. The experts agreed that the themes identified were suitable and relevant to the findings of the review [17] (See Table 4).

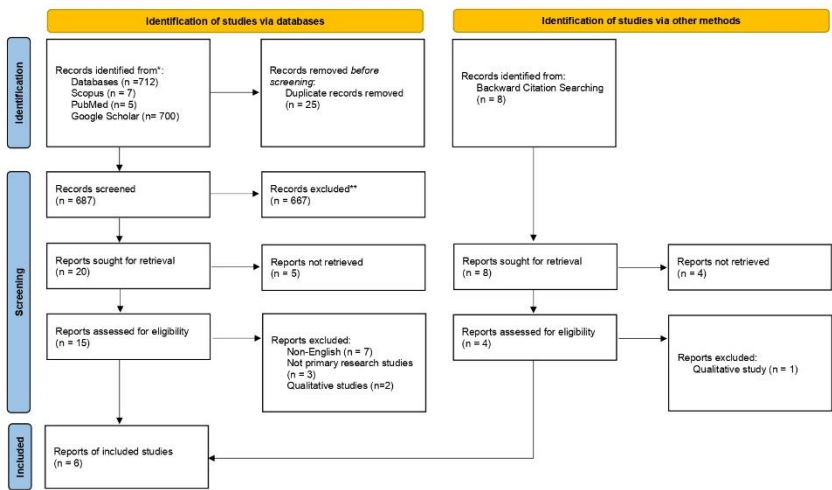


Fig. 1. Adapted from PRISMA New Flow Diagram 2020 [25]

Table 4. The Themes (n=6)

Studies	Years	Region	Knowledge													Previous Involvement/ Experience		Source of Knowledge Information											
			Be	CC	Eff	DE	Me	Acc	Aval	Ad	Go	Nee	Acu	Gen	Type	PU	Pre	Fa	Fr	Se	In	HP	OM	Pa	PR	OS			
Yam, W. and Wilkinson, J. M.	2010	Canada					✓									✓													
Limsatchapanich et al.	2013	Thailand	✓				✓							✓				✓			✓	✓				✓			
Greville-Harris et al.	2016	United Kingdom		✓	✓				✓		✓					✓	✓	✓				✓	✓						
Weeks et al.	2017	Australia					✓										✓					✓	✓		✓	✓			
Than et al.	2019	Malaysia	✓				✓										✓	✓	✓			✓	✓		✓	✓			
Lee et al.	2023	Korea		✓	✓	✓								✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓			
Knowledge			Previous Involvement/ Experience													Source of Knowledge Information													
Be-Benefits of TCM			PU-Prior Use													Fa-Family													
CC-Common Concerns			Pre- Previous Reading/ Hearing													Fr-Friends													
Eff-Acupuncture Efficacy																Se-Themselves													
DE-Drug Effects																In-Internet													
Me-Meridians																HP-Healthcare professionals													
Acc-Accessibility																OM-Other Media													
Aval-Availability																Pa-From other patients													
Ad-Method of Administration																PR-Personal Reading													
Go-Government Regulations/ Legislations																OS-Other Source													
Nee-Use of Needles																													
Acu-Acupoints																													
Gen-General Information																													
Type-Type of Acupuncture																													

3 Results

3.1 Methodological Characteristics

This section will focus on the patients' knowledge levels of TCM based on the selected studies. There are six studies selected from the databases published between 2010 and 2023. Of the six studies selected, one was published in 2010, one was published in 2013, one of them was published in 2016, one was in 2017, one was published in 2019, and another article was published in 2023. In addition, out of the six studies, two were published in the *Journal of Complementary Therapies in Medicine*, one in the *Health Science Journal*, one in *Acupuncture in Medicine*, one in *Food Research*, and another one in *BMC Complementary Medicine and Therapies*. The studies were conducted in North America (Canada), Asia (Thailand, Malaysia, and Korea), Europe (United Kingdom), and Oceania (Australia).

When reviewing these six studies, four explicitly identified their study design as cross-sectional. The remaining two studies [37,31] did not explicitly mention their study design. However, they used surveys and questionnaires to collect data at a single point in time, which aligns with the characteristics of a cross-sectional study. Therefore, all these studies were categorized as cross-sectional study in this review. Besides that, all the study's results were analysed by using the Statistical Package for the Social Sciences (SPSS) software, except for two studies that did not explicitly mention the analysis software used in their study. These include a study by [14] that involved analysis of frequency, percentage, mean, standard deviation, chi-square test, and multiple logistic regression, and another study by [31] that involved analysis of number, percentage, and chi-square test. All the studies provided information about the kind of test performed in their study to analyse the results collected. Furthermore, two studies mentioned data collected using a self-administered questionnaire, one study only mentioned using a questionnaire, one study mentioned using an online questionnaire, one study mentioned using a self-completed anonymous survey, and another study mentioned using a self-report questionnaire.

The systematic review highlights four studies focused on the knowledge of acupuncture particularly among stroke rehabilitation patients [37], patients with back pain [8], surgical patients [31], and chronic disease patients [13]. While [31] investigated from the context of postoperative nausea and vomiting among the surgical patients, [13] considered patients who are suffering from chronic diseases (including musculoskeletal disease, digestive disease, hypertension, endocrine disease and so on). On the other hand, knowledge level of complementary and alternative medicine (CAM), which include TCM, was researched in two studies. While [14] examined the knowledge levels among HIV/AIDS patients, [28] investigated the CAM knowledge among cardiovascular disease (CVD) patients.

3.2 Content Area Investigated

The content areas investigated in this study focused on patients' knowledge levels of TCM. Among the six studies, some studies discussed the levels of knowledge of patients about TCM or CAM (which consists of TCM practices) and emphasized the questions that target group were able to answer correctly or failed to answer correctly. Some studies also mentioned the difference in knowledge levels between those who have experience using TCM treatments and those who have not used TCM treatments before. Additionally, some studies discussed the difference between those who read or heard about acupuncture and those who did not.

The study from [14] used a questionnaire with nine items consisting of general information about CAM, the benefits of CAM, and side effects of CAM to investigate the knowledge levels, in which one point is allocated for each correct answer. The study found that most of the people living with HIV/AIDS ($n=149$, 66.2%) had poor knowledge levels towards CAM (consisting of TCM practices in the study being investigated), which was less than 60 total score according to the Bloom's criteria. Additionally, study by [31] that used a survey also found that the target group had low knowledge levels of acupuncture for postoperative nausea and vomiting. Even though most of the target group ($n=145$, 90.1%) heard about acupuncture practice but still many ($n=135$, 83.9%) were not aware that acupuncture can be used to treat their postoperative nausea and vomiting. On top of that, this study also emphasized the importance of knowledge of acupuncture, side effects, and effectiveness.

In contrast, two studies found fair and moderate knowledge levels. According to the study [28], the target group was found to have fair knowledge of CAM (which includes TCM practices) which is scoring between 51% to 69% according to the study [9]. In terms of TCM, most of the target group was able to answer the general benefits of TCM (70%), the benefits of acupuncture (62.2%), and the advantages of Tai Chi (75.6%). However, most of them were unsure about the benefits of ginseng (55.6%), benefits of Ginkgo Biloba (67.8%), and benefits of Chinese herbal medicine (62.2%). Furthermore, in terms of adverse effect, the target group (51.1%) did not score well on the potential herb-drug interactions between cardiovascular medications and herbal medicine (11.1% failed to answer correctly and 40% were unsure). However, the target group (51.1%) was able to answer correctly regarding potential dangerous drug interactions between modern medicine and supplements.

Similarly, the study by [13] also found that the target group possessed moderate knowledge levels of acupuncture treatment ($n=223$, 60.3%). The target group was found to have relatively high knowledge levels in terms of acupuncture efficacy (89.5%) and government regulations (more than 78%). Nevertheless, the target group had lower levels of knowledge about types of acupuncture and common concerns about acupuncture. Only 26.5% of the target group knew that some patients after the first acupuncture treatment may experience dizziness. Similarly, the acupuncture users in the study were found to have high levels of knowledge in terms of efficacy and government regulations and low levels in term of types of acupuncture and common concerns.

Apart from that, study by [37] found that the target group possessed basic (48%) regarding the use of needles or intermediate understanding levels (33%) regarding fine needles used at acupoints to generate therapeutic responses) towards acupuncture in treating diseases. Meanwhile, there were 11.4% of the target group possessed very limited knowledge of acupuncture which they did not have any information regarding acupuncture and 8% of the target group possessed advanced knowledge levels, which includes meridians knowledge. This study also found higher knowledge levels among those who have used acupuncture before as compared to those who have not used it before. Nearly half of the target group (45%) was discovered to be aware of the location for acupuncture treatment availability.

On the other hand, study by [8] reported that the target group had relatively high knowledge levels on acupuncture treatment, including types of acupuncture, acupuncture efficacy, and common concerns which score at least 80% correct. However, the target group had low levels of knowledge on the method of administration, government legislation, and accessibility of acupuncture treatment. Those with prior use of acupuncture were also found to be more knowledgeable regarding the modality as compared to those who had never used it before. In addition, the mean number of items that the target group who reported previously reading or hearing about acupuncture was able to answer was marginally higher than those who had not, but it was not statistically significant.

Finally, the findings from these studies consists of the source of information, source of recommendation, or cues of action regarding the TCM or its related practices except the study by [37]. From the five studies, the researchers have different opinions on the categorization of the source of information, source of recommendation, or cues of action. For example, in the study by [14], there is a specific variable for cues to action, while in a study by [8], the source of information was categorized under experience. Besides that, the source of information was put under knowledge and experience in study by [31]. In addition, [28] categorized cues to action under the source of recommendation, while study by [13] put them under the source of information. All these studies mentioned the source they obtained information regarding the treatment they received.

4 Discussion

Understanding of the patients' knowledge towards TCM is important as patient can make appropriate medical decisions through obtain, process, and understand health information and services needed [2]. Patients' knowledge can help to improve health outcomes under the circumstances in which knowledge is relevant and evidence-based [19], empowering individuals to make informed decisions about their care, actively participate in managing their conditions, adhere to treatment plans, and communicate effectively with healthcare providers. Furthermore, a knowledgeable patient will be able to handle the difficulties in the healthcare system, speak up for their needs, and work with practitioners to integrate TCM with conventional medicine in their treatment

plan. This integration can result to a better tailored and effective care, improving users experience and health outcomes.

4.1 Assessing Patients' Knowledge Levels

The varying patients' knowledge levels of TCM or its related practices are being observed in the study. Two studies found that target group has poor knowledge levels [14] or low knowledge levels [31]. Conversely, another two studies found that target group has fair knowledge levels [28] or moderate knowledge levels [13]. Furthermore, one study found that most of the target group has either very limited, basic, intermediate, or advance knowledge levels [37], and another one study found that target group has relatively high knowledge levels [8].

Target group was found to have poor levels of knowledge or failed to answer the items regarding the drug effects (including side-effects and adverse effects) of TCM or its related practices [14,28,13]. The study by [14] and [13] mentioned that the target group had poor or low knowledge levels on adverse effects or common concerns (including potential adverse effects) of acupuncture or CAM (with TCM-related practices). Furthermore, the study by [28] also mentioned that more than half of the target group answered wrongly or were unsure about the items regarding adverse effects of CAM for potential herb-drug interaction, which may be due to lack of discussion and disclosure of use to physicians for concurrent use of CAM and conventional medicine. Conversely, study by [8] reported a notably high knowledge levels of common concerns (including side effects), with over 80% of the target group providing correct answers for all the items under common concerns. Moreover, study by [28] also found that more than half of the target group was able to answer the potential danger of drug interaction between modern medicine and supplements correctly. Knowledge of side-effects among patients was important as it can eradicate concerns and doubts about the treatment [31]. The differences in these findings showed the cruciality of further investigation to enhance the understanding of patients' perceptions and knowledge gaps focusing on the adverse effects of TCM and its related practices. As emphasized in [4], awareness of side effects or adverse effects (unwanted effects) plays a significant role in patient treatment preference, and it may be mild to severe or even life-threatening. Hence, the discrepancies in the findings have highlighted the importance of educational and awareness campaigns, which deliver accurate information so that quality, informed decisions can be made regarding TCM and its related practices.

Other than that, study by [8] found that the target group had high knowledge levels towards types of acupuncture. This is in sharp contrast to the findings of the study by [13], where the knowledge of the type of acupuncture is low. These contrasts have suggested possible variations in educational, geographical location, and source of knowledge information. Based on these findings, [10] mentioned the importance of comprehending healthcare recommendations to enable well-informed decision-making. The variation of knowledge levels observed in studies by [8] and [13] has pointed out the need to improve patient education to enhance understanding and utilization of TCM and its related practices as a therapeutic option in the future.

Furthermore, [8] and [13] found that the target group possessed high knowledge levels of acupuncture efficacy, which showed a positive trend in understanding the therapeutic effects. Patients showed high levels of acupuncture efficacy, which may indicate that patients possessed certain expectations towards acupuncture therapeutic benefits [13] which is crucial as patients' positive expectancy may influence health outcomes across various medical conditions [12]. [31] supports that knowledge of effectiveness was crucial in attracting patient to use this treatment. This represents an important knowledge gap which appeared in the healthcare systems, emphasizing the need for health education initiatives covering this area, further enhancing the utilization.

On the other hand, in terms of government laws and regulations, [8] found that the target group had low knowledge levels, in which around one-third of the target group was not aware that acupuncturists in the UK are not governed by any legal requirements. Lack of awareness of the absence of statutory regulation for acupuncture highlights the urgent need for efforts by professional bodies, individual practitioners, and the policy maker to ensure the patients understand the current regulations and the implications of the lack of statutory regulation. However, another study by [13] reported high knowledge levels of government regulations on acupuncture, in which more than 78% of the target group was aware of the licensing requirements for acupuncturists and health insurance coverage. Korea's national healthcare system includes acupuncture which reduces elderly expenditure on this treatment and leads to high utilization in Korea as compared to other countries.

On top of that, a study by [37] found that 45% of the target group knew where to get acupuncture treatments, and more than half of the target group was willing to consider acupuncture treatment if it was available. Even though there are some target groups who know about TCM and its related practices accessibility and availability, there may still be a significant portion of the population who is not completely familiar with the accessibility and availability of TCM and its related practices. Furthermore, it was also found in another study by [8] that the target group reported low knowledge levels towards the accessibility of acupuncture, which only 66.2% of the target group knew they can receive acupuncture treatment in the UK National Health Service. It could be possible that there are potential barriers or challenges in accessing acupuncture treatment and it needs to be addressed so that people are aware of this treatment option and consider uptake in the future.

Besides, [8] also stated that the target group had low knowledge levels of the method of administration. Patients with poor medication knowledge were found not to adhere to the medication [16]. Hence, the method of administration was also crucial treatment and the patients should have adequate knowledge to ensure adherence which will lead to therapeutic success. On the other hand, study by [28] found that most of the target group was able to answer items regarding the general benefits of TCM, the benefits of acupuncture, and the advantages of Tai Chi. This has shown that the target group had high awareness towards the benefits of TCM and its modalities (Tai Chi and acupuncture). In addition, majority of the target group was unsure about the benefits of Chinese herbal medicine, ginseng, and ginkgo biloba. The target group was unsure about the advantages of Chinese herbal medicine which may be because of differences in ethnicities not being familiar with the benefits and functions of the Chinese herbal medicine.

Finally, study by [37] showed that a small percentage of the target group possessed advanced knowledge of meridians. Meridians are a network of channels for vital energy “qi” circulated in the body [20]. [38] have emphasized the importance of understanding meridians to understand TCM. From study by [37], we found that the target group might not fully understand TCM, especially on meridians. So, knowledge of meridians must be given priority when designing educational strategies for promoting TCM to the public.

4.2 Impact of Previous Involvement/Experience

The studies found that target group with prior experience of using TCM or its related practices were more knowledgeable [37,8,13] such as having a higher knowledge of the modality of treatment [8] and higher knowledge of acupuncture efficacy and government regulations [13]. Likewise, another study by [11] indicated that the mean knowledge score for TCM users was higher than those who were not TCM users as before undergoing TCM treatments, TCM users would look up and learn more about all the modalities in TCM. This profoundly shows that prior experience contributes to understanding, familiarity and engagement with the treatment services, which is why users have higher knowledge levels as compared to non-TCM users who might not have a prior understanding about TCM or its related practices.

According to the study [1], when making decisions, individuals often predict future events based on previous experiences as the memories of past events past are often recognized as patterns in present-day experiences. Therefore, the foundation of information gained from the experience itself or vicarious learning enables the person to make sense of the circumstances, leading to an increased level of flexibility, speed, and quality of decision-making. Previous experiences have shown to play an indispensable role in future quality decision-making. This indicates that patients still can have better acceptance and understanding of TCM and its related practices even if there is no indirect approach or exposure to TCM.

4.3 Source of Knowledge Information

Identifying the source of knowledge information about TCM treatments is important because it is essential in ensuring that patients gain adequate proper knowledge about the treatments they receive, which will affect their future actual behaviour. From the findings of the studies, the review found that most of the target group in the three studies [31,28,13] obtained information on TCM or its related practices from family and friends. Nonetheless, there are two studies that identified the different primary sources of information including the internet [8] and HIV-infected friends [14]. In line with this, a survey by The Pew Research Centre found that people will be eager to know more and look for the whole story when they hear about something new from their family or friends [7]. Similarly, a study by [11] also found that majority of the respondents (83.3%) obtained TCM information from family members and friends, which further indicated the strong influence of family and friends in preference for treatments. Moreover, other sources of information such as the internet, healthcare professionals,

social media, personal reading, and patients with the same disease also play an indispensable role in disseminating information regarding TCM practices. Study by [30] has emphasized that consumers perceived the information by family and friends or the internet as complementary rather than mutually exclusive. Hence, other information sources are crucial as well.

However, study by [5] on Western medicine found that healthcare professionals were the main and preferable source of information regarding the target group's treatment as they can guide the patients to obtain quality information. Similarly, according to the study [27], the target group found that health professionals or their doctors are the most trustworthy source of information, then followed by the internet, family, and friends. After contrasting both the study with the findings above, family and friends became the main source of information, possibly due to the physicians or general practitioners the target group encountered might not be able to share information regarding TCM practices. Besides that, patients may not disclose the use of TCM treatments to their physicians because they are afraid of disagreement to the use of TCM treatments, so physicians or general practitioners may not be their main source of information.

4.4 Measurement Tool Development

In the review, there is significant heterogeneity found in the tools used for measuring patients' knowledge level in TCM. This has revealed that the standard tools for knowledge measurement of TCM have yet to be decided. The outcomes for the knowledge variable might not be consistent due to different measurement tools being used. Two studies explicitly detailed the tools used including, Bloom's criteria and a tool adopted from [9], ensuring replicability and standardization in their methodologies. On the other hand, other studies either did not specify their assessment tools or measured the knowledge level based on the number or percentage of items answered correctly, which undermines about the consistency and validity of their findings. This inconsistency highlights the necessity of developing and validating standardized, reliable measurement tools to precisely assess knowledge of TCM. This tool would enhance the overall quality and robustness of the study, as well as its comparability across studies.

Additionally, through the studies, several key aspects of knowledge about TCM were commonly measured, reflecting significant outcomes. These aspects include generic of TCM (including general information of TCM, drug effects of TCM, and benefits of TCM), specific area to be focused in TCM (including the efficacy of acupuncture, common concerns of acupuncture, government laws and regulations, types of acupuncture, method of administration, and accessibility and availability of acupuncture), previous involvement and experience of TCM, and source of knowledge information. Through the integration these key aspects, the measurement tool will provide a comprehensive assessment and evaluation of TCM knowledge level in order to capture the most crucial elements required for effective patient education and well-informed decision-making.

5 Implications

5.1 Theoretical Implications

The different in measurement instruments used to assess knowledge of TCM underscores the need to develop a more standardized and validated tool to measure knowledge accurately. Besides that, the discrepancies in identifying patients' understanding of TCM show the need to strengthen educational initiatives to bridge these gaps. This will not only allow patients to make quality, informed decisions but also support the integration of TCM with current medical practices to improve health outcomes.

5.2 Practical Implications

Healthcare professionals should be trained to provide patients with comprehensive and accessible information about TCM treatment in order to enhance the integration of TCM into current medical practices. Policymakers should consider covering findings from the review when designing an in-depth public health education to ensure important, accurate, evidence-based information is entirely delivered to the public. Policy makers can also implement stricter regulations regarding practitioner registration to ensure the professionalism is guaranteed. Practitioners must undergo sufficient professional training and possess relevant licenses to be eligible to provide quality treatment to the public. As the public lacks faith in TCM due to lack of scientific evidence from their observation, policymakers may investigate more strategies to promote TCM treatment to boost the public education and provide the equal access to medical treatments.

6 Limitations and Future Study

This review also presents a few limitations. Qualitative studies were excluded as the findings cannot be generalized to represent the population. Future studies may include qualitative studies to cover this area comprehensively. Non-English studies were excluded as well from the review to ensure that all included studies could be thoroughly assessed and interpreted. The exclusion of these studies can maintain the consistency of data extraction. However, this action may result in omission of important studies in other languages. The possibility of language bias could impact the comprehensiveness of our findings. Future studies may benefit by including relevant studies published in languages other than English to address this limitation and broaden the review scope. Furthermore, this review focuses on relevant studies that employ patients as the target group to access their knowledge levels of TCM or associated practices. Future studies can include studies that recruit general population as the target group to get a wider view of their holistic understanding of TCM. Furthermore, studies regarding CAM that consist of TCM and its related practices were included in this review as data related to the objective was collected because TCM can be categorized under CAM. Further studies can exclude studies other than TCM or its related practices such as CAM (which

included TCM) so that the target group in the study was recruited solely for TCM and will not be influenced by other kind of treatments. In addition, this study does not explore the influence of demographic profiles and clinical characteristics on knowledge level. Future studies could focus on identifying how these variables affect knowledge level. Lastly, after a thorough search of the databases using keywords and backward citation searching, only selected six studies were included, which shows that the knowledge level of the target group is not well defined, indicating a significant gap that future research should address in this specific area.

7 Conclusion

In summary, this study has contained an in-depth overview of the current state of research on patients' knowledge levels of TCM. Through the analysis of studies, we have identified several common themes, including assessing knowledge levels, the impact of previous involvement or experience, and the source of knowledge information regarding TCM. These findings suggest a need to tailor a holistic educational initiative enhancing patient education to improve understanding, awareness, acceptance, and utilization of TCM and its related practices.

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