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Feasibility and barriers of utilizing moxibustion therapy in Hong Kong: a qualitative study

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Abstract

Background Moxibustion is widely used in mainland China but rarely used in Hong Kong. This study was conducted among traditional Chinese medicine (TCM) practitioners in Hong Kong to collect and explore their experiences and views on the barriers to and possibilities of using moxibustion in Hong Kong.

Methods This qualitative study was conducted via semi-structured individual interviews. Purposive sampling was employed to recruit 13 TCM practitioners who have clinically practiced in Hong Kong for 2 years or more. The interviews were audio-recorded and transcribed verbatim, and the data were subsequently analyzed using template analysis.

Results Three main themes were identified as follows: (1) expectations of moxibustion use in Hong Kong, (2) barriers to moxibustion use in Hong Kong, and (3) possible solutions to enhance moxibustion use in Hong Kong. For the expectation of moxibustion use, the subthemes were (a) merits of moxibustion therapy, (b) effectiveness of moxibustion therapy, and (c) applicability of moxibustion in Hong Kong. For the barriers to moxibustion use in Hong Kong, the subthemes were (a) limits of moxibustion use in clinics, (b) limits of self-help use of moxibustion, and (c) limits of local TCM practitioners' experience of practicing moxibustion. For the suggestions to enhance moxibustion use in Hong Kong, the subthemes were (a) improvements in moxibustion and its accessories, (b) clinic upgrade, (c) government support, and (d) promotion of self-administered moxibustion.

Conclusion Moxibustion is anticipated to gain traction in Hong Kong due to its acceptability and feasibility for clinical and self-help applications, its broad applicability across diverse populations and medical conditions, and its suitability for the Hong Kong climate. Barriers to its clinical use in Hong Kong include strict fire safety regulations for buildings and high labor costs. The public's lack of understanding of moxibustion practice and knowledge in managing potential adverse events limits its self-use. Moxibustion could be promoted in Hong Kong by improving moxa quality and moxibustion equipment, optimizing the layout and ventilation of clinics, refining government support, and popularizing self-administered moxibustion.

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Keywords Moxibustion, Traditional Chinese medicine practitioners, Qualitative research, Hong Kong, Individual interview

Background

Moxibustion is an external traditional Chinese medicine (TCM) modality used for maintaining health and preventing and treating diseases [1]. Originating from primitive society, moxibustion has been practiced for centuries as a holistic approach to heal and promote overall well-being. During this procedure, heat is applied to acupuncture points and certain body regions using ignited moxa sticks or cones [2]. A moxa stick or cone is made of mugwort leaves that are dried, ground, and sieved to remove the stalks and impurities [3]. Therefore, moxibustion is a natural intervention [4] that utilizes mugwort burning to stimulate specific acupuncture points on the body. This natural characteristic makes moxibustion an appealing alternative and complementary treatment free from synthetic chemicals and pharmaceuticals [4]. The use of mugwort in this therapy aligns with TCM principles, which emphasize the use of natural substances to restore balance and harmony within the body [5].

Depending on the amount of heat that can penetrate the body and travel along the meridian energy circulation, moxibustion can warm meridians and expel cold, induce the smooth flow of qi and blood, subdue swelling, and disperse accumulated pathogens [6]. The possible mechanisms of this therapy include its positive effects on the immune system, blood circulation, inflammation, and body metabolites [7] and the thermal effects, radiation effects, and pharmacological actions of moxa and its combustion products [8]. Moxibustion can be used in the treatment of clinical diseases or conditions across internal medicine, surgery, gynecology, pediatrics, and other disciplines. Evidence reveals that moxibustion has beneficial effects on various conditions, including musculoskeletal disorders, gynecological problems, and common health issues [9–11].

Moxibustion is popular in mainland China [12], including its medical use in clinics and hospitals and its self-use at home. The Baidu index demonstrated that from January 2011 to March 2024 (the whole period of this database), the average number of "moxibustion" searches is 3092 per day, which is higher than that of "acupuncture" searches (1,840 per day) [13]. However, moxibustion is less commonly used in Hong Kong probably due to its labor-intensive nature and the difficulty in maintaining ventilation in clinics [14]. Therefore, only a few TCM clinics in Hong Kong offer moxibustion to the citizens, making this therapy unpopular among the public. Nevertheless, many citizens try to find ways to use this intervention by utilizing self-help moxibustion equipment. Our team conducted a randomized controlled trial (RCT) on acupressure for knee osteoarthritis in middle and older adults [15]. In the evaluation questionnaire, several participants inquired about moxibustion, including its effects on knee osteoarthritis and where to purchase it, reflecting the public's interest in this therapy. Clinical trials on moxibustion are also scarce in Hong Kong, especially those studying traditional moxibustion using ignited moxa [16]. Despite its subtropical climate, Hong Kong's modern lifestyle characteristics - including extensive air-conditioning use and high consumption of cold beverages - contribute to cold-dampness constitution among local residents. Moxibustion, with its therapeutic properties of dispelling dampness and warming meridians, is particularly suitable for addressing these health concerns. However, despite its potential beneficial effects and advantages, moxibustion is almost unavailable to both clinics and individuals in Hong Kong. Our study focuses on exploring various factors that may affect moxibustion implementation in Hong Kong's healthcare context, as the low utilization of this potentially beneficial therapy cannot be simply attributed to climatic factors. Understanding the barriers to moxibustion use in Hong Kong and devising strategies to promote its use in clinical and community settings are necessary. Currently, there is a notable research gap regarding moxibustion practice in Hong Kong, with limited studies of any type examining its utilization patterns or implementation challenges. In this context of limited existing research, a qualitative approach is particularly appropriate as it allows for an in-depth, ground-level understanding of TCM practitioners' perspectives and experiences. This methodological choice enables us to explore the complex factors affecting moxibustion practice, identify implementation barriers, and understand practitioners' needs for support within the current healthcare policy framework. Additionally, qualitative inquiry can uncover emerging issues that might not be anticipated in advance. The findings from this exploratory study can inform future research directions, including the design of large-scale quantitative surveys, by identifying key variables and concerns that warrant further investigation. Based on these considerations, we conducted individual interviews with Hong Kong TCM practitioners to collect their experiences and views on moxibustion use in Hong Kong.

Methods

This study adopted a descriptive qualitative design [17], which was grounded in naturalistic inquiry and aimed to gain a comprehensive understanding of an event. The findings were reported in accordance with the

consolidated criteria for reporting qualitative research (COREQ) [18]. Registered TCM practitioners were recruited in Hong Kong between October and December 2023. Purposive sampling was conducted for sample selection, and eligible TCM practitioners willing to participate in the interviews were invited to join. The inclusion criteria for the qualitative study were as follows: (1) being a registered TCM practitioner in Hong Kong and (2) having more than 2 years of clinical experience in Hong Kong. After the research purpose, procedures, and significance were thoroughly explained, each participant provided written informed consent. They were also informed about the use of audio recordings, the confidentiality of their information, and their right to withdraw from the study at any time without penalty.

Participants

The participants were invited to individual interviews to share their experiences and perspectives on moxibustion application in Hong Kong. Information on the qualitative study was provided to potential participants either orally or in written form to determine their participation interest. The informed consent form mainly included the purpose, design, and procedure of the study, benefits and risks of participation, personal data/privacy, and contact for future information. The eligible participants who expressed interest were then invited to complete the informed consent form. Their preferred times for participation were noted. Suitable time and venue for the individual interview were scheduled. For thematic saturation, we followed the guidelines suggested by Saunders et al. [19], which recommend roughly 12–24 participants to achieve saturation in qualitative studies, depending on the uniformity of the samples and complexity of the study topic.

Table 1 Questions for the semi-structured interview

1. How would you generally describe your understanding of moxibustion therapy?
2. Aside from classroom learning, have you had systematic and practical experience with moxibustion therapy during clinical internships?
3. Do you use moxibustion therapy in your daily practice? (Frequency of use, specific conditions or health maintenance, effectiveness, examples)
4. In your opinion, for which demographic groups is moxibustion therapy effective?
5. In your opinion, what conditions respond well to moxibustion therapy?
6. Do you consider moxibustion therapy to be a viable method for health maintenance?
7. In your opinion, what are the advantages of moxibustion therapy compared to other treatments (in terms of effectiveness, administration, acceptability, etc.)?
8. In your opinion, what are the limitations of moxibustion therapy compared to other treatments (in terms of effectiveness, administration, acceptability, etc.)?
9. What difficulties do you think TCM clinics in Hong Kong face when utilizing moxibustion therapy? (Smoke, odor, safety, facilities, public acceptance, etc.)
10. Do you think it is possible to overcome the challenges of implementing moxibustion therapy in Hong Kong, and what suggestions do you have? (Equipment, policies, TCM practitioner training, etc.)
11. In Hong Kong, if moxibustion therapy were widely used in everyday clinical practice, do you think it would bring significant benefits to the general public?

Data collection

The first author (SCC), a research assistant professor, developed an interview guide in Chinese consisting of 11 open-ended questions (Table 1). This guide was revised by two experienced TCM practitioners (WFY and QXZ) and a qualitative researcher (SCC). A pilot test was conducted with one participant to ensure the comprehensibility of all the questions. Semi-structured individual interviews were conducted face to face by three moderators (LYP, JYG, and SCC), with each interview lasting approximately 30–60 min [20]. The three moderators all hold Bachelor or higher degrees in medical science and have received formal training in qualitative research methods through research methodology trainings by the corresponding author (WFY), who is an experienced qualitative researcher. The chief moderator (SCC) attended all interviews of this study, and she has previously participated in 7 qualitative studies in healthcare settings. Additionally, their TCM research background ensures appropriate understanding and interpretation of technical terminology and concepts during the interviews. The interviews took place in each participant's clinic. A Cantonese native moderator (LYP) and a Mandarin native moderator (JYG) were moderators to facilitate the interviews and make field notes. All the participants were interviewed in their first language (Cantonese or Mandarin) so they could freely express their thoughts. For each interview, the moderator introduced himself/herself, outlined the purpose and procedures of the interview, emphasized the importance of confidentiality, and clarified any questions. Data collection was stopped when thematic saturation was reached. All interviews were audiotaped and transcribed verbatim in Chinese prior to data analysis. As an incentive, the participants were offered HK$300 supermarket coupons.

Data analysis

Prior to data analysis, all interviews were recorded and transcribed verbatim in Chinese. Transcripts were returned to participants for comment. Each participant was assigned a randomly generated code to ensure confidentiality. Descriptive characteristics outlining the demographic data were provided. Data were analyzed by template analysis [21]. Two independent researchers (LYP and MRW) thoroughly read each transcript multiple times to immerse themselves in the data and gain a

comprehensive understanding of the participants' experiences and views on moxibustion application in Hong Kong. The researchers then manually conducted line-by-line coding and condensed the coding units according to shared similarities and differences. Additional coding units at the abstract level were extracted and clustered into subthemes and themes with a relatively high abstract level. Any disagreements were resolved through discussion until consensus was reached. The finalized themes and subthemes and their corresponding representative quotes were translated into English. Coding management was facilitated using MS Word.

Results

Fourteen registered TCM practitioners were invited and 13 participated in this study, and an equal number of individual interviews were conducted in Mandarin or Cantonese. The theme and subtheme structure was established during the first 10 interviews, and we continued to collect data until the 13th interview, which allowed us to achieve thematic saturation, both enriching and confirming the established themes, as well as ensuring the reliability of our findings. The average duration of the interviews was approximately 38 min 48 s with a range of 29–53 min.

Participants' characteristics

The participants comprised 13 registered TCM practitioners, of whom six were female (46.2%). Their average age was 40.54 years (SD = 10.20), and their average working experience was 14.23 years (SD = 9.58). Seven of them had their undergraduate education in mainland China, and the other six received their undergraduate education in Hong Kong. Detailed demographic information of the participants is presented in Table 2.

Main themes

The following three themes were identified regarding the participants' experience in moxibustion: (1) expectations of moxibustion use in Hong Kong, (2) barriers to moxibustion use in Hong Kong, and (3) possible solutions to enhance moxibustion use in Hong Kong. The specific subthemes under each theme are described. Table 3 presents the code structure and illustrative quotations.

Theme 1: expectations of moxibustion use in Hong Kong

This theme consists of three subthemes: (a) merits of moxibustion, (b) effectiveness of moxibustion therapy; and (c) applicability of moxibustion in Hong Kong.

Merits of moxibustion The practitioners consistently identified that moxibustion had unique merits compared with other TCM modalities. Specifically, analysis revealed two primary advantages: its high acceptability among TCM practitioners and the public, and its demonstrated feasibility for self-help use in urban settings. This non-invasive nature and gentle warming effect particularly distinguishes it from other treatments, as one practitioner said:*"Moxibustion is really convenient and easily accessible. Acupuncture may make you feel pain, whereas moxibustion will only make you feel warm. It will also not make your skin uncomfortable."* (M005). *The development of modern delivery methods has further enhanced its practical applications, as another* described the convenience of portable moxibustion: *"If you use moxibustion, such as portable moxibustion, you can directly tie it to your body and do it while doing other things."* (M010).

Effectiveness of moxibustion The practitioners identified distinct patterns regarding the efficacy of moxibustion. Their clinical observations indicated that the target population mainly consisted of the elderly and women. A

Table 2 Demographic characteristics of participants interviewed (*N* = 13)

ID	Age, y, Mean (SD)	Gender, no. (%)	No. of work years, Mean (SD)	Highest education level	Destinations for a bachelor degree	Destinations for a master's degree	Destinations for a doctorate degree	First language no. (%)	Length of interview, min, Mean (SD)
P001	40.5 (10.2)	Male: 7 (53.8) Female: 6 (46.2)	14.2 (9.6)	Master	Mainland China	Hong Kong	/	Mandarin: 7 (53.8) Cantonese: 6 (46.2)	38.9 (8.0)
M001				Master	Mainland China	Hong Kong	/		
M002				Master	Mainland China	Hong Kong	/		
M003				Doctor	Mainland China	/	Mainland China		
M004				Master	Hong Kong	Hong Kong	/		
M005				Doctor	Hong Kong	/	Mainland China		
M006				Doctor	Hong Kong	/	Hong Kong		
M007				Master	Hong Kong	Hong Kong	/		
M008				Master	Hong Kong	Hong Kong	/		
M009				Bachelor	Hong Kong	/	/		
M010				Master	Mainland China	Mainland China	/		
M011				Master	Mainland China	Hong Kong	/		
M012				Master	Mainland China	Hong Kong	/		

Table 3 Coding tree of the qualitative study

Theme	Sub-theme	Code Units
• Expectations of moxibustion use in Hong Kong	• Merits of moxibustion	• Acceptability of TCM practitioners and the public (simple, convenient, non-invasive, natural)
		• Feasibility for self-help use (economic, simple, flexible)
	• Effectiveness of moxibustion	• Target population: majoring in the old and women
		• Target treatment diseases: majoring in pain, digestive, gynaecological diseases
		• Target health-keeping conditions: sub-health, deficiency syndrome, cold syndrome
	• Applicability of moxibustion in Hong Kong	• Fitness of the local climate (hot and humid)
		• Fitness of the local population's habits (eating, dressing, sleeping, and air-conditioning)
• Barriers to moxibustion use in Hong Kong	• Limits of moxibustion use in clinics	• Strict building safety management regulations (smoke and fire prevention, smell control)
		• Limits of the treatment area (small treatment area for ventilation)
		• Patients' different acceptability of moxibustion (smell, temperature, equipment, ash)
		• Close monitoring throughout the treatment (high labor cost)
		• Influence on the treatment environment (stale air, smell, ash, stain)
	• Limits of self-help use of moxibustion	• Difficulties for people without professional training (e.g. acupoints and moxibustion selection)
		• Possible related adverse events (e.g. burn, respiratory problems, infection, complaints of family)
		• Safety issues smoke and fire (small living area, lack of fire ventilation system)
		• Lack of conditions and professional ability to deal with adverse events in time
	• Limits of local TCM practitioners' experience of practicing moxibustion	• Lack of chances to improve moxibustion knowledge and skills (internship, professional training)
		• Low priority of applying moxibustion therapy
• Possible solutions to enhance moxibustion use in Hong Kong	• Improvements in moxibustion and its accessories	• Advancement of moxibustion equipment (e.g. smokeless, infrared, anti-scald design)
		• Improvement of moxa quality (purity, processing mode)
	• Clinic upgrade	• Upgrade of ventilation upgrade (ventilation equipment, treatment room layout, smell adsorption)
		• Upgrade of patient arrangement (visiting time, acceptability of moxibustion)
	• Government support	• Support on scientific research (clinical trials to examine the effects of moxa smoke)
		• Support on clinic upgrade (decoration, equipment purchases)
	• Promotion of self-administered moxibustion	• Promotion of moxibustion to the public (basic knowledge, practice skills, adverse event handling)
		• Promotion of TCM practitioner-patient communication (e.g. treatment duration, frequency)

practitioner mentioned: *"Moxibustion can benefit people who are usually afraid of cold, especially girls with cold hands and feet, as well as older patients with relatively deficient blood and energy."* (M002) The therapeutic scope encompasses chronic pain along with digestive and gynecological diseases. Beyond disease treatment, the TCM practitioners emphasized the role of moxibustion in maintaining health, especially for deficiency syndrome, cold syndrome, and subhealth. *"For chronic arthritis, gastrointestinal diseases, and sleep disorders, I think moxibustion may have a better effect…"* one remarked (M011). This range of applications suggests moxibustion's versatility in both therapeutic and preventive care.

Applicability of moxibustion in Hong Kong The practitioners' insights revealed a unique therapeutic niche for moxibustion in Hong Kong, shaped by both environmental and sociocultural factors. The city's subtropical climate, characterized by high humidity and heat, interacts with modern urban lifestyle patterns including eating, dressing, sleeping, and air-conditioning habits. One indicated the effects of moxibustion on dampness: "*Hong Kong's climate is humid, and people are more likely to have deficient energy and experience dampness. Moxibustion influences health and dampness*" (M004). This climate-health relationship is further complicated by contemporary urban behaviors, as practitioners noted: *"…staying up late at night, and then liking to eat and drink cold foods"* (P001); *"…experience though air-conditioning systems are often operated at a high intensity in Hong Kong."* (M001) These observations suggest that moxibustion's warming and drying properties may be particularly beneficial in addressing health issues arising from the interaction between Hong Kong's climate and modern lifestyle choices.

Theme 2: barriers to moxibustion use in Hong Kong

The barriers consisted of the following three subthemes: (a) limits of moxibustion use in clinics, (b) limits of self-help use of moxibustion, and (c) limits of local TCM practitioners' experience of practicing moxibustion.

Limits of moxibustion use in clinics Analysis of practitioners' responses revealed five key structural barriers limiting moxibustion use in Hong Kong clinics: strict safety management regulations for buildings, small treatment areas, patients' acceptability of moxibustion, high labor cost for close patient monitoring, and environmental impacts such as ash or stain. The regulatory constraints emerged as the primary challenge, as a participant emphasized: *"Implementing moxibustion in Chinese medi-*

cine clinics in Hong Kong is difficult primarily due to the ventilation system in buildings. Performing moxibustion poses difficulties to clinics in terms of requiring ventilation, smoke exhaust, and rooms with windows…Potential complaints from neighbors and issues regarding building-safety measures may also arise. Accordingly, not every clinic wants to perform moxibustion." (M004) The resource-intensive nature of the treatment presents another significant barrier, with one practitioner highlighting the high cost of manpower: *"Moxibustion requires a high level of manpower, and you may need to perform moxibustion for twenty minutes. During this period, you need to be next to the patient to monitor them, which means that you need to pay more attention than performing acupuncture."* (M006) These operational challenges reflect the broader tension between traditional therapeutic practices and modern urban healthcare delivery systems.

Limits of self-help use of moxibustion The practitioners identified four critical safety and competency challenges limiting self-administered moxibustion among the general public: lack of professional training for laymen, possible health-related adverse events, possible safety issues on smoke and fire, and inadequate knowledge for managing adverse events in time. The risk of improper application was particularly concerning, as one described a misbelief from patients and the possible result: *"Some patients perform moxibustion themselves. They may think 'the hotter, the better.' However, they end up burning themselves and even blister."* (M005) Beyond immediate safety concerns, practitioners emphasized the complexities of post-treatment care. A practitioner brought up the problem of adverse event handling: *"People may find difficulty in taking care of themselves after an injury. In Hong Kong, you need to go to a clinic every day to have your wound cleaned, applied with medication, and wrapped with gauze to prevent infection. Doing these procedures at home may not be easy for many individuals"* (M003) These challenges highlight the need for comprehensive safety protocols and education in self-administered moxibustion.

Limits of local TCM practitioners' experience of practicing moxibustion The interviews revealed a systemic limitation in moxibustion practice experience among practitioners in Hong Kong, particularly notable among those who had received higher education in the same region. This knowledge gap appears to create a self-perpetuating cycle, as one practitioner noted: *"In Hong Kong, even individuals with school education or training have relatively little understanding of moxibustion. Thus, its practical application is also relatively rare…"* (P001). This limited exposure during professional training appears to contribute to reduced implementation in clinical practice, potentially constraining the development of moxibustion expertise in the local context.

Theme 3: possible solutions to enhance moxibustion use in Hong Kong

The solutions were: (a) improvements in moxibustion and its accessories, (b) clinic upgrade, (c) government support, and (d) promotion of self-administered moxibustion.

Improvements in moxibustion and its accessories Practitioners identified technological and material innovations as key pathways to enhance the possibility of practicing moxibustion in Hong Kong. The potential of modern adaptations was highlighted by a practitioner who recommended smokeless and infrared moxibustion: *"For equipment upgrades, smokeless moxibustion is currently available, but not many people use it. Infrared moxibustion is also available, but it requires machines that ordinary clinics do not have"* (M006). In parallel with technological solutions, material quality optimization was emphasized, as another practitioner suggested to choose purer moxa to reduce smoke production: *"We use pure moxa without any other medicinal ingredients. The reason is that more ingredients added can cause stronger smoke emission or odor when burned"* (M005). These suggestions reflect a dual approach to innovation, combining technological advancement with refinement of traditional materials.

Clinic upgrade Analysis of practitioner responses revealed infrastructure and operational modifications as critical elements for clinic improvement, with ventilation upgrades universally identified as a priority concern. One practitioner affirmed the role of smoking devices: *"Smoking devices can be improved to help us perform moxibustion better."* (M004) Beyond physical infrastructure, practitioners emphasized the importance of strategic scheduling optimization to minimize olfactory disturbance to others. *"When regulating the time for patients, moxibustion patients are concentrated at the same time so as not to easily affect others"*, one said (M005). These proposed improvements reflect a comprehensive approach to clinic modernization, addressing both technical infrastructure and operational management to enhance treatment delivery while minimizing environmental impact.

Government support The practitioners' perspectives on governmental intervention revealed two primary domains requiring strategic support. First, there was a strong emphasis on the need for evidence-based research, exemplified by one practitioner's proposal: *"Some studies actually say that smoke exerts a relaxing and warming effect. However, to determine how much it differs, I think we*

really need to conduct randomized studies to increase our understanding." (M006) The second domain focused on infrastructure development through financial assistance, with practitioners seeking support for clinic modernization. *"…I would apply for government funding to obtain support for renovating my clinic for moxibustion implementation"*, a practitioner said (M007). This dual focus on research advancement and facility enhancement suggests a comprehensive approach to developing moxibustion practice, combining scientific validation with practical implementation support.

Promotion of self-administered moxibustion Practitioners advocated for a structured approach to promoting self-administered moxibustion, emphasizing the integration of knowledge dissemination, practical skill development, and professional guidance. A comprehensive public education strategy was proposed, as one practitioner suggested: *"The Chinese Medicine Council of Hong Kong or the Department of Health can regularly hold more promotional seminars on moxibustion therapy. They can also distribute some moxa sticks to the public and provide relevant operating instructions so that they can do it at home. The goal would be to achieve a more extensive level of knowledge regarding this therapy."* (P001) The importance of professional oversight in ensuring safe practice was emphasized through practitioner-patient communication: "If you buy and try it yourself, I think the risk is very high. Nevertheless, if you have a prescription and a physician has taught you how to use it, I think it would be relatively safe." (M006) This dual emphasis on public education and professional guidance reflects a balanced approach to promoting safe and effective self-administered moxibustion.

Discussion

Main findings

Moxibustion is commonly used in mainland China for clinics and the general public. However, it is rarely used in Hong Kong, and the reasons have not been explored. Our study provided an in-depth exploration of Hong Kong TCM practitioners' perspectives on and experiences with moxibustion and the barriers and strategies to promote its use in Hong Kong. After analyzing the data from the participating TCM practitioners, several key findings emerged. The identified themes focused on the expectations of moxibustion use in Hong Kong, the barriers of using this therapy in Hong Kong, and the possible strategies for promoting its utilization.

Our findings revealed that moxibustion can be applied in Hong Kong. The TCM practitioners emphasized the merits of this therapy (e.g., simple, convenient, non-invasive, natural, economic, and flexible) and its efficacy in disease treatment (e.g. pain, digestive, and gynecological diseases) and health keeping (e.g., subhealth, deficiency syndrome, and cold syndrome) as reflected in TCM theory [1]. Given that Hong Kong is an international city with a high development level [22], most of the people living in this region are under great stress [23]. A survey conducted by the University of Hong Kong reported that 97% of Hong Kong citizens have one or more suboptimal health symptoms, such as dizziness, headache, back pain, and chronic fatigue [1]. Although subhealth is common among the public [24], feasible interventions with simple delivery procedure and low cost, such as self-administered moxibustion, could be an option for them to improve their health conditions in daily life. In addition, dampness and cold constitution are common among local residents because of the hot and humid climate [25] and the local residents' corresponding living habits (cold eating and drinking, thin dressing, staying up late, and intense cold air-conditioning). TCM theory stresses the effects of moxibustion for cold and damp syndrome due to its warm characteristics [1]. Several clinical trials also supported its beneficial effects for patients with cold–damp pattern [26, 27]. Some of the interviewed practitioners mentioned the flexibility of moxibustion because it could be combined with needles, which is consistent with many previous studies. An RCT on 72 patients with cold–dampness knee osteoarthritis demonstrated that compared with those in the conventional medicine group, the patients in the group subjected to thunder-fire moxibustion combined with electroacupuncture had significant reductions in Visual Analogue Scale score, Lequesne index, and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) score immediately and 4 months after the treatment ($P < 0.05$) [26]. On the basis of these reasons, moxibustion has high applicability in Hong Kong and should be promoted whenever possible.

This study pointed out the barriers preventing partitioners to deliver moxibustion in a clinical setting and for self-administered moxibustion in Hong Kong and the limited experience of local TCM practitioners in practicing this intervention. Restrictions on moxibustion use in clinical settings are particularly prominent and mainly encompass strict smoke management regulations for buildings, small treatment areas for ventilation, and high labor cost. According to the Fire Safety (Buildings) Ordinance (Cap. 572) in Hong Kong, clinics should be equipped with necessary fire service installation and mechanical ventilation system [14]. Given that moxa burning inevitably produces a substantial amount of smoke, clinics could not administer this therapy if they are not equipped with an exceptionally strong system for smoke control and a good clinic layout for ventilation. The high incidence of moxibustion-related adverse events is another barrier for the promotion of

this therapy. A survey in Korea reported that moxibustion was the cause of 38% of burns in oriental medical clinics [28]. A systematic review on the adverse events of moxibustion reported 55 cases suffering from related adverse events, and the most common conditions were allergic reactions, burns, and infections [29]. Another systematic review on the effects of moxibustion also reported some cases suffering from throat problems or receiving complaints due to moxa smoke [30]. Aside from a good ventilation system in the clinics, additional manpower is required to closely monitor the patient during the treatment. However, the acute shortage of health care and TCM practitioners [31, 32] leads to high labor costs [33] and limits the use of moxibustion as a routine clinical treatment. For self-administered moxibustion, the lack of professional moxibustion knowledge and skills among individuals are major problems that may increase the risk of health-related adverse events and fire/smoke-related safety issues. This point was reported by several previous studies and news reports. A retrospective study examined the records of 59 patients treated for moxibustion-induced burns and demonstrated that around half of the patients were burned during the self-administration of moxibustion at home [34]. A news report stated that several citizens of Zhangzhou (Fujian, China) suffered from burns after using moxibustion for maintaining their health at home [35]. In 2023, another news report in Shenzhen (Guangdong, China) featured a fire caused by a resident's inappropriate use of moxibustion at home, which ignited the adjacent combustibles. This accident led to the death of three people and the injury of one person [36]. Similar fire cases related to the improper use of moxibustion have also been reported in recent years [37]. Therefore, professional moxibustion skills, adverse event handing training, and safety education should be provided to the general public for their safety.

The findings highlighted several strategies for promoting moxibustion use in Hong Kong. The advancement of moxibustion equipment is feasible in Hong Kong. Smokeless, infrared, and anti-scald designs were suggested by the TCM practitioners. Several clinical trials also attempted to overcome the defects of traditional moxibustion and optimize its advantages. *Kim* and colleagues [38] designed and tested an ultrasonic moxibustion device. By employing the finite element method for the simulation of temperature distribution and acoustic pressure, they found that the performance of the device was similar to traditional moxibustion. *Dong* and colleagues [39] invented a mobile moxibustion robot based on *AprilTag* that could autonomously navigate indoors and simulate manual moxibustion therapy. This design can reduce the burden of practitioners to a certain extent. *Wang* and colleagues [40] designed a smokeless moxibustion instrument with open flame and an intelligent control system that meets the requirement of smoke control and safety. Although these novel moxibustion devices provided inspiration for moxibustion use, doubts about these designs have been raised, similar to concerns put forward by some of the TCM practitioners in this study. They mentioned the need for rigorous clinical trials to examine the effects of smoke, smell, and other ingredients of moxibustion. An RCT comparing traditional and smokeless moxibustion for knee osteoarthritis found no statistically significant difference between the two groups for WOMAC and other secondary outcomes [41]. To date, trials with head-to-head comparisons are lacking, and the studies are generally of low-quality design (e.g., small sample size and unrigorous statistical analysis). Therefore, additional support from the government could be provided in this area.

Implications

For policymakers, allocating financial support to TCM clinics in Hong Kong is recommended to facilitate the adoption and enhancement of moxibustion practices. This support could be utilized for the improvement of clinic infrastructure, including ventilation system and layout design, and the acquisition of necessary equipment. In addition, collaboration with neighboring provinces in mainland China could be pursued to expand training opportunities for the TCM practitioners in Hong Kong, thereby enhancing their proficiency in moxibustion techniques.

For researchers, innovative moxibustion equipment with advanced design and materials (e.g., smokeless, infrared, anti-scald designs and materials) suitable for use in Hong Kong is needed. In addition, clinical trials must be conducted to investigate the effects of moxibustion's smoke, aroma, and other components to comprehensively understand its mechanisms. This understanding will inform the research direction and development efforts aimed at creating new moxibustion equipment.

Strengths

First, the interviewed TCM practitioners had diverse undergraduate educational backgrounds. About half originated from mainland China and possessed extensive moxibustion experience prior to their practice in Hong Kong, and the remaining participants received their TCM education locally. This approach aimed to gather comprehensive information from the participants and facilitate a comparative analysis of moxibustion practices between mainland China and Hong Kong. Second, this study implemented a pilot phase involving one TCM practitioner to assess feasibility. The preliminary findings from this initial interview were thoroughly reviewed by the research team. This process contributed to the refinement of the interview guide. Third, the participants were

interviewed in person at their respective work clinics, enabling them to showcase the moxibustion materials and equipment they utilize in their daily practice.

Limitation

This qualitative study has some limitations. Two moderators, who are native speakers of Cantonese or Mandarin, interviewed the participants separately. This strategy minimized the communication barriers between the moderators and participants caused by their different first languages, improving the depth and quality of the obtained responses. However, this approach may also lead to inconsistencies in the collected data [42]. Before the commencement of the study with a standardized approach to interviewing, and to ensure a standardized approach to interviewing, the two moderators had been trained by an experienced researcher in qualitative research to ensure consistency in their interview methods and response interpretation. In addition, an experienced researcher was present as the assistant moderator for all the interviews, sitting by the moderators to monitor and adjust the interview orientation and details.

Conclusion

Our findings suggest that moxibustion can be used in Hong Kong due to its acceptability and feasibility for clinical and self-use applications, its potential to address a wide range of medical conditions across diverse population groups, and its applicability for the hot and humid climate of Hong Kong. The barriers to the clinical use of moxibustion in Hong Kong primarily stem from strict fire safety regulations for buildings and the high labor costs associated with patient monitoring. The limitations of self-administered moxibustion include mainly the public's lack of professional knowledge in moxibustion practice and the management of potential adverse events such as burns or fires. Moxibustion use in Hong Kong could be promoted by enhancing the quality of moxa and moxibustion equipment, improving the layout and ventilation of clinics, increasing government support for moxibustion-related research, and popularizing self-administered moxibustion.

Abbreviations

TCM	Traditional Chinese medicine
RCT	Randomized controlled trial
COREQ	Criteria for reporting qualitative research
WOMAC	Western Ontario and McMaster Universities Osteoarthritis Index

Supplementary Information

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Supplementary Material 1

Supplementary Material 2

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Authors' contributions

SSC: Conceptualization, Writing - Original Draft. LYP: Investigation, Data Curation, Formal analysis. JYG: Investigation. MRW: Data Curation, Formal analysis. JQ: Writing - Review & Editing. QWF: Writing - Review & Editing. QXZ: Writing - Review & Editing. WFY: Methodology, Formal analysis, Writing - Review & Editing. All authors approved the final manuscript.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

Research ethical approval was obtained from the Hong Kong Polytechnic University Institutional Review Board (Ref. No.: HSEARS20230810004). Informed consent to participate was obtained from all of the participants in the study.

Consent for publication

All participants gave written informed consent for their personal details along with any identifying images to be published in this study.

Competing interests

The authors declare no competing interests.

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