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Perceptions towards the practice of Andean traditional medicine and the challenges of its integration with modern medicine. Case Cuenca, Ecuador

Percepciones sobre la práctica de la medicina tradicional andina y los desafíos de su integración con la medicina moderna. Caso Cuenca, Ecuador

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ABSTRACT

There is currently a resurgent interest in traditional medicine. The World Health Organization suggested applying strategies for its proper integration into the National Health System. This study seeks to know and understand the opportunities and challenges of the practice of Andean traditional medicine (ATM) in Cuenca (Ecuador) within the context of a possible integration with modern medicine (MM) from the perspective of healers, physicians, and users. The study is qualitative and has a phenomenological design. Convenience and snowball sampling was applied to select participants for focus groups, individual semi-structured interviews, and individual non-participatory observations. The information was qualitatively processed, and the findings categorized into 2 major themes (a. Opportunities in the practice of ATM, and b. Challenges in the potential integration of ATM in MM) and 14 associated subthemes, respectively 6 in the first main theme and 8 in the second main theme. Participants characterized the strengths and weaknesses in integrating Andean traditional medicine with modern medicine. Findings suggest that an appropriate integration of ATM with MM request a government regulatory framework encouraging the protection of ancestral wisdom and biodiversity, a safe and rational application of joint therapies, and research development in the area.

Keywords: Andean traditional medicine, modern medicine, integration, Ecuador.

RESUMEN

Actualmente existe un renovado interés en la medicina tradicional. La Organización Mundial de la Salud sugirió la aplicación de estrategias para su apropiada integración en el Sistema Nacional de Salud. Este estudio busca conocer y comprender las oportunidades y desafíos de la práctica de la medicina tradicional Andina (ATM) en Cuenca (Ecuador) en el contexto de una posible integración con la medicina moderna (MM) desde la perspectiva de los curanderos, médicos y usuarios. El estudio es cualitativo y tiene un diseño fenomenológico. Se aplicó muestreo por conveniencia y por bola de nieve para seleccionar a los participantes de los grupos focales, entrevistas individuales semi-estructuradas y observaciones individuales no participativas. La información se procesó cualitativamente y los hallazgos se categorizaron en dos temas principales (a. Oportunidades en la práctica de ATM y b. Desafíos en la posible integración de ATM y MM) y 14 subtemas asociados, 6 en el primer tema principal y 8 en el segundo. Los participantes caracterizaron las fortalezas y debilidades en el proceso de integración de la medicina tradicional Andina con la medicina moderna. Los resultados sugieren que una apropiada integración de ATM con MM requiere un marco regulatorio gubernamental que promueva la protección del conocimiento ancestral y de la biodiversidad, una aplicación racional y segura de terapias combinadas y el desarrollo de investigación en el área.

Palabras clave: Medicina tradicional Andina, medicina moderna, integración, Ecuador.

1. INTRODUCTION

The World Health Organization (WHO) recognizes the holistic character of Traditional Medicine (TM) to treat physical and mental illnesses (World Health Organization, 2019). Traditional healers have a different understanding of health/disease than the perspective of Modern Medicine (MM). The Andean concept of health involves living in a whole and healthy manner characterized by the internal harmony of the human being and congruence with the surrounding environment (i.e., the family, the community, nature, and the cosmos) (Mathez-Stiefel *et al*., 2007). In the Andean worldview, health is a concept beyond the purely biological and physiological perspective of MM. Restoring the energetic balance between the ill person and the proximate environment leads to health recovery (Bautista-Valarezo *et al.*, 2020). Therefore, health and disease conceptions result from interactions between individuals and their habitats.

To date, the National Health System of Ecuador only endorses MM. Therefore, governmental and social efforts are necessary to achieve its integration with MM, as in China and India (Dobos & Tao, 2011; Lahariya, 2018). Although the efforts to encourage collaboration between ATM and MM in Ecuador, this integration is far from achieved.

This study yielded a reference point on the practice of ATM from the perspectives of healers, physicians, and users. It discusses the opportunities and challenges ATM faces to remain an essential part of the cultural heritage and achieve official recognition within the National Health System.

2. METHODS

2.1. Study design

The present research is a qualitative study with a phenomenological design, developed with the authorization of the Ministry of Environment of Ecuador No. 161-17-IC-FLO-DPZZ/MA.

2.2. Participants

Participants were selected by convenience and snowball sampling methods. The number of participants in the focus groups, semi-structured interviews, and non-participatory observations was adequate to achieve data saturation for all codes. Inclusion criteria for participants of this study were: a) local healers with recognized experience in providing ATM services; b) local physicians with recognized MM professional experience accredited by a university; and c) local users of ATM (senior adults, adults, and young people). Table 1 depicts the sample characteristics of the participants.

Table 1. Sample characteristics of the participants in the focus groups, the semi-structured interviews, and the nonparticipatory observations.

	FOCUS GROUPS					
Characteristics	Healers		Physicians		Users	
	Mean (range)	n (%)	Mean (range)	n (%)	Mean (range)	n (%)
Sex		1 (50)		1 (20)		6 (60)
Female		1 (50)		4 (80)		4 (40)
Male						
Age	59 (58-60)		56 (48-60)		36 (18-67)	
Years of experience in ATM	34 (30-38)		31 (23-42)			
Place of residence						
Urban		1 (50)		3 (60)		10 (100)
Rural		1 (50)		2 (40)		
Schooling status						
None						
Primary school		2 (100)				2 (20)
Secondary school						4 (40)
University				5 (100)		4 (40)

	SEMI-STRUCTURED INTERVIEWS		NON-PARTICIPATORY OBSERVATIONS	
Characteristics	Mean (range)	n (%)	Mean (range)	n (%)
Sex				
Female		16 (89)		4 (100)
Male		2 (11)		
Age	59 (37-87)		61 (46-78)	
Years of experience in ATM	27 (6-50)		36 (25-50)	
Place of residence				
Urban		3 (17)		2 (50)
Rural		15 (83)		2 (50)
Schooling status				
None		13 (72)		2 (50)
Primary school		4 (22)		2 (50)
Secondary school				
University		1 (6)		

2.3. Data collection

Researchers collected information through focus groups, semi-structured interviews, and non-participatory observations between June and August 2016. Each collection method employed a specific guideline (Tables 2 and 3). Field notes assisted in data documentation from non-participatory observations. Voice recorder aided to register information referred by the participants in the focus groups and semi-structured interviews. Recording quality was optimal for proper transcription and further analysis. The average length of focus groups was 52 minutes (range 35-60 minutes) of semi-structured interviews was 25 minutes (range 12-39 minutes), and of non-participatory observations was 2.5 hours (range 1-4 hours).

Table 2. Focus groups guidelines.

Andean Traditional Medicine (ATM)
What are the advantages and disadvantages of the use of ATM?
Why do people choose ATM for healing?
Do you know about cases of malpractice in ATM? If the answer is yes, which one's?
What is the role of faith in ATM?
Modern Medicine (MM)
Is there any advantage of using the isolated active compound of a plant instead of the whole plant for treating diseases?
Integration of ATM and MM
How would you define ATM and MM?
What would be the result from the combined use of ATM and MM?
In ATM, the spirituality of the healer in the healing process is essential. How can this criterion be applied in MM?
How can Andean pathologies* such as 'mal del arco iris', 'susto', 'mal aire', 'mal ojo', and 'shungo' be treated from the vision of MM?

** Definitions of Andean Pathologies:*

'Mal del arco iris' is triggered by the rainbow or solar spectrum action in stagnant waters. The person gets sick when walking near these places. This disease is common among young women. The major symptoms are depression, asthenia, muscle pain, vesicles, and pustules in the legs or the entire body.

'Susto' or 'Espanto' is produced by unpleasant experiences such as accidents, violent episodes, or distress with an emotional impact on the patient. Characteristics of this disease are nervousness, lack of appetite, and loss of sleep.

'Mal aire' is caused when strong winds are present while a person walks through cemeteries or places with hidden treasures ('burials') or contact with cold air. Its major symptoms are dizziness, headache, vomiting, stomach pain, fainting, and general body discomfort.

'Mal ojo' is generated by a person who throws an intense gaze with affection or hatred towards another. Children are more likely to suffer from this discomfort. Among the characteristic symptoms are fainting, nervousness, pale face, headache, diarrhea, vomiting, and fever. In children, it is common to observe asthenia, constant crying, and crusting in the eyes.

'Shungo' is a liver condition caused by sudden falls that change this organ's original position. It is seen mainly in children and commonly manifests with stomach pain, asthenia, vomiting, and fever. Treatment comprises the relocation of the liver.

Table 3. Semi-structured interview guidelines**.**

Practice of ATM
What are the diseases you commonly treat?
How do you diagnose a disease?
What are the plants you use for treating diseases?
What are the reasons for choosing the plants you use to treat a disease?
Where do you obtain medicinal plants?
How do you use medicinal plants? Mixed preparations or alone?
What method of preparation of medicinal plants do you commonly use to cure a disease?
What part/s of the plant do you use to treat a disease?
How do you guarantee the efficacy of your treatments?
What complications can occur when traditional medical treatments are applied?
Integration of ATM and MM
When a patient comes to you with any ailment or symptom, is it you who diagnoses the disease or is the diagnosis provided by a physician?

2.4. Data analysis

Based on a preliminary bibliographic search was the collected information grouped into two major categories, respectively: a) Opportunities in the practice of ATM, and b) Challenges in its potential integration with MM. Common clusters of themes generated subcategories (codes) within the main ones. Three researchers individually revised the emerging code system to confirm the extraction of all codes. Discrepancies were solved through discussions to reach a consensus or to fine-tune codes. Researchers performed a qualitative content analysis using Atlas.ti software (version 8.3.0). Three researchers individually read the field notes from the non-participatory observations and the transcriptions of focus groups and semi-structured interviews to fine tune code content. Furthermore, two researchers, experts in the topic, reviewed the content to confirm the accurateness of the coding processes. Analysis of the information continued until data saturation was reached for all codes.

3. RESULTS AND DISCUSSION

Fourteen subcategories associated with the two pre-defined major categories were identified: a) Opportunities in the practice of ATM and b) Challenges in its potential integration with MM (Table 4).

Table 4. Main categories and subcategories.

Opportunities in the practice of ATM
Reasons for consultation
Reported efficacy
Accessibility
Touristic attraction
Disease conception
Relationship physician-patient and healer-patient
Challenges in the potential integration of ATM and MM
New generations
Therapeutic methods
Poisoning, adverse effects, and interactions
Complex clinical cases
Combined use of ATM and MM
Regulation and control of the medical practice
Training in ethnomedicine and ethnopharmacology
Model of intercultural health

3.1. Major category: Opportunities in the practice of ATM

Reasons for consultation

Cultural influence seems to play an essential role in preferring ATM. In this context, medicinal infusions appear to be one of the most common forms of therapy:

> *In the house, the mother or the father frequently suggest drinking medicinal plant infusions to feel better* (Ramiro, physician).

TM's importance becomes relevant in Latin America countries because it is part of their culture and traditions (Finerman & Sackett, 2003; Tene *et al.*, 2007). The current permanence of ATM seems associated with its confirmed therapeutic benefits to treat muscular pain, body malaise, menstrual cycle alteration, headache, nausea, among others (Torri, 2013; Tinitana *et al.*, 2016; Andrade *et al*., 2017). In addition, there is evidence that active compounds isolated from medicinal plants are used in TM (Orrego-Escobar, 2015). One of the significant milestones in the research field of antineoplastic properties is paclitaxel (Nikolic *et al.*, 2011).

Reported efficacy

Users emphasized the perceived efficacy of ATM against diseases for which they did not find improvement with MM:

> *Babies commonly suffer from 'shungo'* [a disorder conceived from ATM and described in Table 2]. *The physician only prescribes* (…) *Pedialyte® [a commercial oral rehydration solution] and nothing else. Then the parents bring the baby to people who know about ancestral medicine, and they diagnose it as 'shungo'* (...) [with ATM treatment] *the baby is fine, next day* (Alejandra, young user).

Consulted users also reported a perception of greater efficacy and immediate improvement achieved with ATM than with MM:

> *Suppose that I suffer from stomach pain. The physician prescribes me a pill, some syrup, so many pills!* (...) *The plants possess more effect than pills: sometimes, with a single type of plant, the pain is gone rapidly* (Gabriel, young user).

The reported ATM practices are associated with the fact that Andean wisdom has adopted those medicinal practices with confirmed efficacy, while the non-efficacy ATM practices fall into disuse (Vides-Porras & Álvarez-Castañeda, 2013). As stated by Karunamoorthi *et al.* (2013) showed herbal medicine a healing power in the treatment of certain diseases. Compared to the drug dosage, the immediate effect of ATM compared with MM probably relies on a higher dose of active compound in the plant. Another explanation for the effect enhancement is the presence of other herbal composites, absent in the pharmacological form.

Accessibility

The affordable cost of ATM stands out as one of the reasons for encouraging its use:

> *A medical appointment with a physician costs about thirty or forty American dollars. Then I prefer going to a traditional healer* (Humberto, adult user).

ATM offers prompt access to health care by not being over-saturated as with MM:

> *If my patient cannot access the website [to schedule a medical appointment] or public medical attention takes too much time because of the long queues* (...) *If my patient is not receiving medical attention at the hospital when required because there is availability in thirty or forty days* (…), *the disease will worsen* (Santiago, physician).

The rise of health cost in Latin America, Asia, and Africa positioned TM as a more accessible option (Galabuzi et al., 2010). Diverse factors such as economic aspects, migration, and in most cases the inefficiency of National Health System associated with MM supports ATM use. Patients reject MM shortcomings such as inadequate coverage and access problems to health services. In addition, the compulsory journey to other cities for laboratory tests or evaluation by specialists, deterioration of the physician-patient relationship, absence of satisfactory therapeutic results, and short-time medical appointments influence their preferences (Lingard *et al*., 2002). Over-saturation of the Public Health System compels the application of the rule, which is in line with the international standard, of a maximum time limit of 15 minutes to provide Health Services in Public Institutions.

Touristic attraction

The practice of ATM at the herb markets of Cuenca appears as a touristic attraction for foreigners who visit the place:

> *I realized that the process of 'limpia'* [a traditional practice for a spiritual cleansing carried out with a bouquet of plants tied in the shape of a broom] *was considered a tourist attraction. In the observations course, groups of foreigners were interested spectators of this*

> *ancestral practice* (non-participatory observation report directed to Rebeca, healer).

Community-Based Tourism (CBT) generates an integral development characterized by a positive impact on the regional economy and dual preservation of its cultural elements and natural resources (Morales González, 2008). Thus, community members participate in a co-responsible manner for the development of appropriate environmental and tourism policy issues (Maldonado-Erazo *et al*., 2020).

Perhaps one of the more sensitive aspects of this matter is the intellectual appropriation of ancestral wisdom. Misappropriation occurs when the development of ATM practices occurs in a different context than the original. Besides, when a Government Regulatory Institution endorses health tourism, adequate control over the efficacy and safety of the offered traditional treatments is guaranteed and so perceived by the patient who is also a consumer of this potential health/tourism alternative (Majeed *et al*., 2017).

Disease conception

Healers associate the patient's discomfort with an internal or external energy imbalance, whereas MM physicians explain disease by understanding the physio-pathological processes occurring in the organism. Hence, physicians ignore how to treat ATM pathologies related to energy imbalance:

> *A physician can talk about diseases, but never about energy* (Fernando, young user).
>
> *It is a spiritual exercise. You strengthen your emotions, all your vital energy* (...) *A whole consciousness about the relationship with Nature, with the animals* (Enrique, healer).

Unlike MM, which separates spirit and matter, body and soul, ATM conceives them as a fundamental entity. Andean worldview comprehends a disease as an energy imbalance, and its treatment comprises restoring it. In ATM, healing processes involve magic-religious principles that combine rational and magical thinking. Rationality allows the healer to resolve a body dysfunction, while magic enables to cure of a spiritual, psychic, or emotional disorder (Bautista-Valarezo *et al.*, 2020). There is a considerable increase in patients using TM to treat emotional disorders, mainly depression or anxiety (Armijos *et al*., 2014).

Relationship physician-patient and healer-patient

A poor physician-patient relationship also influences preference for ATM. Healers treat patients with respect, considering them as peers who share the same beliefs and customs:

> *Sometimes, physicians treat their patients disparagingly. Seeing them as peasants, they are mistreated, without respect. If patients come without taking a shower* [because] *maybe they come from remote sites with no access to water* (...) *physicians treat them with contempt. Therefore, people prefer traditional medicine* (Ruth, physician).

There is still a need to sensitize health personnel about knowing their patients' customs and practices. It could promote tolerance, respect, and attachment, positively affecting the treatment and preventing potentially harmful interactions between conventional and alternative therapies (Zörgo *et al*., 2018).

3.2. Major category 2: Challenges in the potential integration of ATM with MM

New generations

An essential factor influencing a future potential extinction of ancestral wisdom is the recognition of MM in the National Health System of the country. Over time, if the lack of access to information regarding ATM persists, it could be displaced and forgotten:

> *Our grandparents practiced traditional medicine. They know how to cure* (...) *That traditions are being forgotten* (...) *they no longer exist* (Alejandra, young user).

Public bibliographic or documented sources on ATM are scarce. Ancestral wisdom spread is beneficial not only for users but also for healers. Having access to reliable sources of information supports continuing training:

> *I have a booklet about how to perform 'limpias'. By reading it, a healer can learn how to accomplish this process* (Dolores, healer).

Besides, new generations of healers are interested in conveying their ancestral wisdom accompanied by scientific evidence to show its efficacy:

> *We possess information that we are currently collecting. At some point, we are going to publish it into a scientific journal because we want to show that ATM is trustworthy as the other medicine* [MM] (Enrique, healer).

Lack of interaction among the healers and their communities hinders the oral transmission of ancestral knowledge. Young people who seem to show little or no interest in knowing and preserving traditional wisdom appear to be influenced by the Government's recognition of MM but not TM within the National Health System (Jensen *et al*., 2011). Therefore, there is a need to collect and spread ancestral wisdom and traditions in mass media to promote its conservation (Kamsu-Foguem & Foguem, 2014).

Protection and preservation of ancestral wisdom are essential to ensure its appropriate integration with MM. It is necessary to record ATM knowledge through a method that enables scientific validation of the traditional healing procedures and the therapeutic benefits of herbal resources (World Health Organization, 2002). In this context, intellectual property matters demand special attention (Tupper, 2009). It is advisable to protect ancestral wisdom by complying with existing or new intellectual property rights regulations without being or becoming an impediment to the production of new scientific knowledge derived from traditional wisdom (World Health Organization, 2013; Ijaz & Boon, 2018).

Therapeutic methods

It appears to be a widespread belief that TM employs natural treatments, whereas MM uses synthetic drugs to treat diseases, considering both as different and unrelated therapeutic methods. Participants recognized ATM therapy as a healing treatment; unlike MM drugs, which seem harmful to them:

> *It is better to drink homemade infusions than going to the physician* (...) *Because medical*

> *doctors use chemicals* (...) *We do not use them* (Esther, healer).

Vegetable supplies serve to prepare traditional remedies, an essential source of therapeutic agents. A lack of knowledge about patent medicines' origin becomes clear since many are derivatives of natural products (Balunas & Kinghor, 2005). Both ATM and MM use active chemical compounds to treat diagnosed pathologies. With MM, the active compound is administered in an isolated and dosed form and through pharmaceutical formulations specially designed to favor an adequate concentration of the drug in the target organ or receptor. In ATM, the active compound is administered together with others present in the plant, hindering an accurate dosage.

Poisoning, adverse effects, and interactions

Nescience could lead to misuse of ATM. MM physicians have identified cases of intoxication, adverse effects, or lack of efficiency of prescribed pharmacological treatment because of interactions with the active compounds of medicinal plants:

> *There are interactions between drugs and a mixture of plants. The active compounds will interact with each other, and* [the pharmacological action] *will be canceled or enhanced* (Ruth, physician).

Patients rely on TM because of its proven efficacy but must be careful when using natural products. It is impossible to dismiss an interaction with other drugs that could generate adverse effects in the patient (Asher et al., 2017). There are medicinal plants that cause few or no side effects when they are used alone. When combined with prescribed drugs, they could produce serious health problems. For example, ginseng antagonizes the pharmacological effect of warfarin (Dong *et al.*, 2017).

Complex clinical cases

One of the most critical limitations of ATM healers is the therapeutic inexperience to recognize, treat or cure diseases that compromise a patient's life. Clinical complications can lead to a severe dysfunction or even to death when not being opportunely remitted to a MM specialist:

> *Patients come to us being unable to solve their medical issues. For example, they previously consulted 'sobadores'* [traditional healers who are expert in bone and muscle-related illnesses] *which aggravated the femur fracture* (Álvaro, physician).
>
> *As for childbirth, I have seen many unfair practices. For instance, if the child is transverse, the mother needs a cesarean. When the healers try to 'accommodate' it, this practice could cause a complication, and the child or the mother can die. This procedure could damage the uterus* (Ruth, physician).

Although some TM procedures possess proven effectiveness, this is not the case for all of them in situations of imminent risk. Thus, the ability to identify potential threats is of great importance when performing ATM practices while avoiding engaging the user in an adverse case (World Health Organization, 2000).

Combined use of ATM and MM

The combined use of ATM with the therapy prescribed by the physician seems to be a common practice, especially regarding the treatment of chronic diseases in senior adults:

> *I have diabetes. Sometimes, I help myself with medication and infusions that I prepare at home. You know diabetes treatment is complicated* (...)*, so I treat it with pills and infusions* (Amelia, senior adult user).

In Australia, Europe, and North America, the combined use of TM and MM's has increased, especially treating and controlling chronic diseases (World Health Organization, 2002). Integration of TM and MM seems to generate greater adherence to prescribed pharmacological treatment and to favor a better physician-patient relationship (Vides Porras & Álvarez Castañeda, 2013).

Regulation and control of the medical practice

The absence of a regulatory entity to prevent and control ATM malpractice allows people without knowledge and with the sole intention of generating profits, commercialize or perform procedures with no therapeutic effects that may even cause adverse severe or undesired effects:

> *One thing is traditional medicine performed by expert healers, and another is charlatanism. We have to be very attentive to it* (Ramiro, physician).

Both in MM and ATM, it is workable to identify positive behavior: knowledge/wisdom of the physician/healer, efficacy, and commitment. Likewise, it is possible to observe improper conduct such as deceptive marketing and unscrupulous manipulation for profit in both cases. However, in TM's case, irresponsible behavior could be favored by a lack of Government regulations and non-existent control (World Health Organization, 2002). Indeed, legislative efforts frequently focus on the MM practices neglecting other sectors, such as TM (Peltzer & Pengpid, 2019).

Training in ethnomedicine and ethnopharmacology

Physicians perceive the need to be trained on the therapeutic use of medicinal plants and their possible adverse effects and interactions when combined with MM drugs:

> *They* [the patients] *always ask: With what infusion should I take this pill? If I say: With cinnamon infusion, they ask: Is it a plant with 'hot' properties? If I say: You can take this pill with lemonade, they say: Not so! It has 'cold'* properties [type of ancestral classification of plants: hot and cold, based on their general pharmacological activity described in ATM]. *Hence, we have to study this way of classifying plants to know how to adapt our prescriptions to them and for gaining the patient's trust* (Ruth, physician).

National training programs with the endorsement of the Ministry of Public Health of Ecuador have encouraged healers to share their wisdom and experiences with other colleagues and physicians. These events involve the

participation of physicians who learn about ATM and actively contribute to integrating it with MM:

> *I have taken part since 1985. I was a leader of the National Health Council. We were pioneers at the beginning. We have trained people at a national level, almost in all provinces* (Dolores, healer).

> *We all are trying to attend the courses* (...) *These courses come from many years ago. I took part in these studies together with physicians. These courses gather a sizeable group of people* (Sara, healer).

MM practitioners' training in ATM matters could significantly improve the physician-patient relationship and the treatment and adherence, even preventing possible interactions between drugs and medicinal plants (Taddei *et al*., 1999).

Effective promotion of the combined use of ATM and MM relies on patients, healers, and physicians' active interaction. The Ecuadorian Health System must encourage the academic community to develop programs for training in health matters and support scientific research to promote its effective integration with MM (Hita, 2014). However, the achievement of this aim should be cautiously analyzed, as in other environments such as politics, religion, or science where absolute hegemonies provoke paralysis and involution, which may also be the case of ancestral wisdom (World Health Organization, 2013; Herrera *et al*., 2019).

Model of intercultural health

Ecuador is attempting to develop an intercultural Public Health Model involving ATM. Thus, primary health care units should locate ATM providers and train them for the promotion and development of collaboration:

> *I am a midwife* (...) *I go to the hospital where I help women to give birth, together with the physicians* (Sara, healer).

There is a current tendency for private Health Centers in Ecuador to offer combined TM and MM therapies:

> *We want to offer a different alternative service. My brother is a physician and he and our father, who is a 'Yachak'* [a main traditional healer recognized in ATM], *cooperate* (Enrique, healer).

The official regulation of ATM practices promotes and supports good practices and fair access, ensuring the authenticity, safety, and efficacy of traditional therapies. Establishing this regulation must be cautious since, by 'conventionalizing' its practices, it could increase the cost of services, devaluing or suppressing their cultural identity and minimizing its social role (Herrera *et al.*, 2019; Krach *et al*., 2018). The Government regulation or the freedom to proceed in TM cannot be limited by each other. It is possible to identify and build intermediate processes. Future research in this area will allow the development of flexible integration methods that encourages healers, physicians, and users to develop regulations and establish a proper regulatory entity (Hu & Calduch, 2017).

3.3. Limitations and recommendations for future research

Our findings are limited to the case study area. A wider group of participants is desirable for future research to achieve more precise documentation of the crucial factors affecting the integration of ATM and MM in Ecuador.

4. CONCLUSIONS

ATM is a crucial component of the cultural identity of Andean Latin America countries. This cultural influence could be one reason users prefer it as a first health care option instead of MM. Lower costs for ATM services compared to MM seem to reinforce this preference. In addition, is accessibility among other a positive characteristic of ATM favoring its attention. There is no need to schedule an appointment, as with MM. Also, the relationship users maintain with healers is much closer since the healer considers the patient equal and vice versa. Besides, given the relevance of ATM as a constituent of indigenous community culture and the worldwide growing interest in using TM, traditional practices can be promoted as community-based tourism. Policies are required to fortify properly associated praxis, such as the conservation of biodiversity, especially regarding those linked to the use of medicinal plants in ATM.

Health/disease conception is different for ATM and MM. Users perceived ATM treatments as more effective than the ones from MM. This appreciation seems to be attributed to the fact that ATM heals spiritual harm besides bodily diseases. Medicinal plants are the basis of ATM treatment, given the perception that 'natural plants are harmless'. Also, the noticeable judgment exists that chemical drugs could generate adverse side effects. Unawareness of active compounds being present in medicinal plants can lead to improper usage and the appearance of adverse effects or unwanted interactions when they are administered together with MM drugs.

In this context, research and regulatory policies should establish official protocols for preventing and controlling adverse reactions associated with ATM and MM combined therapies. The absence of a government entity regulating ATM practices seems to favor the presence of charlatans who perform therapeutic procedures without ancestral knowledge. Precise and updated regulations encourage medicinal plants rational use involving defined dosage and respect for biodiversity and traditional wisdom. Therefore, a regulatory framework and scientific research are crucial for the proper integration of ATM and MM.

Although the joint use of ATM and MM seems to have scarce acceptance, scientific evidence supports the achievement of better results with its combined use. In this regard, the exchange of valuable knowledge and experiences must be encouraged through continuous training, paying attention to the intellectual property rights of indigenous communities.

Summarizing, MM and ATM's integration requires an initial agreement between healers and physicians on therapeutic practices, responsible use of medicinal plants by patients, and the proper guidelines for conserving ancestral wisdom. Likewise, studies on the therapeutic application of medicinal plants are also required to promote their rational use.

DECLARATIONS

Ethics approval and consent to participate

The Bioethics Committee of the San Francisco University from Quito, Ecuador, approved the study (code 2016-084E). All participants provided written informed consent for being part of this research and the publication of obtained results. This publication used pseudonyms for anonymity.

Availability of data and materials

Please contact the corresponding author for data requests.

Competing interest

The authors have declared that no potential competing interest exists.

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Author's contributions

AOP and LHT designed the study. VQG and DGL conducted the fieldwork. AOP, VQG, DGL, GBL, and RA performed the data analysis. AOP, VQG, and DGL drafted the manuscript. All authors read and approved the final manuscript.

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REFERENCES

Andrade, J. M., Lucero Mosquera, H., & Armijos, C. (2017). Ethnobotany of Indigenous Saraguros: medicinal plants used by community healers 'Hampiyachakkuna' in the San Lucas Parish, Southern Ecuador. *BioMed Research International*, 2017, 20 pp. https://doi.org/10.1155/2017/9343724

Armijos, C., Cota, I., & González, S. (2014). Traditional medicine applied by the Saraguro yachakkuna: A preliminary approach to the use of sacred and psychoactive plant species in the southern region of Ecuador. *Journal of Ethnobiology and Ethnomedicine*, *10*(26), 12 pp. https://doi.org/10.1186/1746-4269-10-26

Asher, G. N., Corbett, A. H., & Hawke, R. L. (2017). Common herbal dietary supplement-drug interactions. *American Family Physician*, *96*(2), 101-107. www.aafp.org/afp

Balunas, M. J., & Kinghorn, A. D. (2005). Drug discovery from medicinal plants. *Life Sciences*, *78*(5), 431-441. https://doi.org/10.1016/j.lfs.2005.09.012

Bautista-Valarezo, E., Duque, V., Verdugo Sánchez, A. E., Dávalos-Batallas, V., Michels, N. R. M., Hendrickx, K., & Verhoeven, V. (2020). Towards an indigenous definition of health: an explorative study to understand the indigenous Ecuadorian people's health and illness concepts. *International Journal for Equity in Health*, *19*(101), 8 pp. https://doi.org/10.1186/s12939-020-1142-8

Dobos, G., & Tao, I. (2011). The model of western integrative medicine: The role of Chinese medicine. *Chinese Journal of Integrative Medicine*, *17*(1), 11-20. https://doi.org/10.1007/s11655-011-0601-x

Dong, H., Ma, J., Li, T., Xiao, Y., Zheng, N., Liu, J., Gao, Y., Shao, J., & Jia, L. (2017). Global deregulation of ginseng products may be a safety hazard to warfarin takers: Solid evidence of ginseng-warfarin interaction. *Scientific Reports*, *7*(1), 11 pp. https://doi.org/10.1038/s41598-017-05825-9

Finerman, R., & Sackett, R. (2003). Using home gardens to decipher health and healing in the Andes. *Medical Anthropology Quarterly*, *17*(4), 459-482. https://doi.org/10.1525/maq.2003.17.4.459

Galabuzi, C., Agea, J. G., Fungo, B. L., & Kamoga, R. M. N. (2010). Traditional medicine as an alternative form of health care system: A preliminary case study of Nangabo sub-county, Central Uganda. *African Journal of Traditional, Complementary and Alternative Medicines*, *7*(1), 11-16. https://doi.org/10.4314/ajtcam.v7i1.57224

Herrera, D., Hutchins, F., Gaus, D., & Troya, C. (2019). Intercultural health in Ecuador: an asymmetrical and incomplete project. *Anthropology and Medicine*, *26*(3), 328-344. https://doi.org/10.1080/13648470.2018.1507102

Hita, S. R. (2014). Salud, globalización e interculturalidad: Una mirada antropológica a la situación de los pueblos indígenas de Sudamérica [Health, globalization and interculturalism: an anthropological approach to the situation of indigenous peoples in South America]. *Ciencia e Saude Coletiva*, *19*(10), 4061-4069. https://doi.org/10.1590/1413-812320141910.09372014

Hu, Q., & Calduch, R. M. (2017). On traditional Chinese medicine regulation in China: How quality and safety of use are insured. *Pharmacological Research*, *119*, 371-372. https://doi.org/10.1016/j.phrs.2017.02.025

Ijaz, N., & Boon, H. (2018). Statutory regulation of traditional medicine practitioners and practices: The need for distinct policy making guidelines. *Journal of Alternative and Complementary Medicine*, *24*(4), 307-313. https://doi.org/10.1089/acm.2017.0346

Jensen, L. A., Arnett, J. J., McKenzie, J., & Jensen, L. A. (2011). Globalization and cultural identity. In: S. Schwartz, K. Luyckx, & V. Vignoles (Eds.), *Handbook of Identity Theory and Research* (pp. 285–301). Springer. https://doi.org/10.1007/978-1-4419-7988-9-13

Kamsu-Foguem, B., & Foguem, C. (2014). Could telemedicine enhance traditional medicine practices? *European Research in Telemedicine*, *3*(3), 117-123. https://doi.org/10.1016/j.eurtel.2014.08.001

Karunamoorthi, K., Jegajeevanram, K., Vijayalakshmi, J., & Mengistie, E. (2013). Traditional medicinal plants: A source of phytotherapeutic modality in resource-constrained health care settings. *Journal of Evidence-Based Complementary and Alternative Medicine*, *18*(1), 67-74. https://doi.org/10.1177/2156587212460241

Krah, E., de Kruijf, J., & Ragno, L. (2018). Integrating traditional healers into the health care system: Challenges and opportunities in rural Northern Ghana. *Journal of Community Health*, *43*(1), 157-163. https://doi.org/10.1007/s10900-017-0398-4

Lahariya, C. (2018). 'Ayushman Bharat' Program and universal health coverage in India. *Indian Pediatrics*, *55*(6), 495-506.

Lingard, L., Tallett, S., & Rosenfield, J. (2002). Culture and physician-patient communication: a qualitative exploration of residents' experiences and attitudes - PubMed. *Annals of the Royal College of Physicians and Surgeons of Canada*, *35*(6), 336-340.

Majeed, S., Lu, C., & Javed, T. (2017). The journey from an allopathic to natural treatment approach: A scoping review of medical tourism and health systems. *European Journal of Integrative Medicine*, *16*, 22-32. https://doi.org/10.1016/j.eujim.2017.10.001

Maldonado-Erazo, C. P., del Río-Rama, M. de la C., Noboa-Viñan, P., & Álvarez-García, J. (2020). Community-based tourism in Ecuador: Community ventures of the provincial and cantonal networks. *Sustainability*, *12*(15), 30 pp. https://doi.org/10.3390/SU12156256

Mathez-Stiefel, S., Boillat, S., & Rist, S. (2007). Promoting the diversity of worldviews: an ontological approach to biocultural diversity. In: *Endogenous Development and Bio-cultural Diversity. The interplay of worldviews, globalization and locality* (pp. 67-81). ETC/COMPAS.

Morales González, M. (2008). ¿Etnoturismo o turismo indígena? [Etnotourism or indigenous tourism?]. *Teoría y Praxis*, *4*(5), 123-136. https://doi.org/10.22403/uqroomx/typ05/09

Nikolic, V. D., Savic, I. M., Savic, I. M., Nikolic, L. B., Stankovic, M. Z., & Marinkovic, V. D. (2011). Paclitaxel as an anticancer agent: Isolation, activity, synthesis and stability. *Central European Journal of Medicine*, *6*(5), 527-536. https://doi.org/10.2478/s11536-011-0074-5

Orrego Escobar, E. F. (2015). Latin-American plants as a source of new antineoplastic drugs, current situation and new opportunities against cancer. *Medwave*, *15*(3), p. e6121. https://doi.org/10.5867/medwave.2015.03.6121

Peltzer, K., & Pengpid, S. (2019). A survey of the training of traditional, complementary, and alternative medicine in universities in Thailand. *Journal of Multidisciplinary Healthcare*, *12*, 119-124. https://doi.org/10.2147/JMDH.S189644

Taddei, G., Santillana, M., Romero, J., & Romero, M. (1999). Aceptación y uso de herbolaria en medicina familiar [Acceptance and use of herbal medicine in family medicine]. *Salud Pública de México*, *41*(3), 216-220.

Tene, V., Malagón, O., Finzi, P. V., Vidari, G., Armijos, C., & Zaragoza, T. (2007). An ethnobotanical survey of medicinal plants used in Loja and Zamora-Chinchipe, Ecuador. *Journal of Ethnopharmacology*, *111*(1), 63-81. https://doi.org/10.1016/j.jep.2006.10.032

Tinitana, F., Rios, M., Romero-Benavides, J. C., de la Cruz Rot, M., & Pardo-de-Santayana, M. (2016). Medicinal plants sold at traditional markets in southern Ecuador. *Journal of Ethnobiology and Ethnomedicine*, *12*(29), 18 pp. https://doi.org/10.1186/s13002-016-0100-4

Torri, M. C. (2013). Perceptions and uses of plants for reproductive health among traditional midwives in Ecuador: Moving towards intercultural pharmacological practices. *Midwifery*, *29*(7), 809-817. https://doi.org/10.1016/j.midw.2012.06.018

Tupper, K. W. (2009). Ayahuasca healing beyond the Amazon: the globalization of a traditional indigenous entheogenic practice. *Global Networks*, *9*(1), 117-136. https://doi.org/10.1111/j.1471-0374.2009.00245.x

Vides Porras, A., & Álvarez Castañeda, A. (2013). La medicina tradicional como un modelo de atención integral en salud [Traditional medicine as a model of comprehensive health care]. *Revista UVG*, 58-60. http://uvg.edu.gt/publicaciones/revista/volumenes/numero-25/7_la%20medicina%20tradicional.pdf

World Health Organization. (2000). *General guidelines for methodologies on research and evaluation of traditional medicine*. Available at https://apps.who.int/iris/handle/10665/66783

World Health Organization. (2002). *Medicina tradicional: necesidades crecientes y potencial [Traditional medicine: growing needs and potential]*. Available at https://apps.who.int/iris/handle/10665/67296

World Health Organization. (2013). *Estrategia de la OMS sobre medicina tradicional 2014-2023 [WHO strategy on traditional medicine 2014-2023]*. Available at www.who.int

World Health Organization. (2019). *Traditional, complementary and integrative medicine*. Available at https://www.who.int/traditional-complementary-integrative-medicine/about/en/

Zörgo, S., Purebl, G., & Zana, Á. (2018). A qualitative study of culturally embedded factors in complementary and alternative medicine use. *BMC Complementary and Alternative Medicine*, *18*(25), 11 pp. https://doi.org/10.1186/s12906-018-2093-0