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ORIGINAL RESEARCH

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Delivering Acupuncture Therapy in an Interdisciplinary Global Health Setting in Guatemala: Pilot Study and Lessons Learned

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ABSTRACT

Objective: Pain, stress, and diabetes mellitus (DM) are common complaints for Guatemalans seeking health care. Because acupuncture therapy (AT) is a low-cost, effective treatment for these concerns, it was offered to Guatemalans during a health care mission as an adjunct to primary care. The purpose of this study was to gather feedback about providing AT in this context and to describe the lessons that were learned.

Materials and Methods: A pretest single-arm exploratory study design was used, collecting demographic data and administering a pretest to patients referred for AT. Patients received AT according to presenting symptoms, except patients with DM, who were treated with a previously developed auricular AT protocol. After AT, all patients received adhesive seeds for self-administered auricular acupressure, along with a printed diagram, showing where and how to apply them, and a symptom-tracking form.

Results: AT was given to 11 patients (1 had DM; 10 did not). Most were female (9; 82%), older (average 59.27 years; range: 40–81 years), and had little education (average 4 years; range: 0–12 years). Complaints were pain (11; 100%), insomnia (6; 55%), anxiety (4; 36%), depression (7; 64%), and stress (3; 27%). More than 50% had seen health care providers (6; 55%). One person had AT previously and 3 people requested more information about AT before receiving it.

Conclusions: Reporting high symptom burdens, most patients were unfamiliar with AT. AT ceased when the licensed acupuncturist contracted COVID. Patients will be followed in 2023 and AT will be given to collect data on feasibility, satisfaction, and possible implementation.

Keywords: acupuncture therapy, global health, pain, mental health

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INTRODUCTION

GUATEMALA IS A SMALL COUNTRY in Central America, slightly larger than the U.S. state of Kentucky.[1] Among the total population of 17.15 million people, 40% are descended from indigenous Mayas, while the other 60% are Spanish-speaking individuals, colloquially called Ladinos.[2] Indigenous Mayans experience a higher poverty rate, marginalization, lower resources, and worse health outcomes than Ladinos.[3] During the 36-year civil war (1960–1996), ~2,000,000 people suffered casualties, and 200,000 died. Indigenous Mayans comprised 83% and 73% of these statistics, respectively.[4]

The most-common symptom among Guatemalans when presenting for health care is pain.[5] These symptoms are a direct result of the substantial shift toward manual labor that the civil war had on the Guatemalan economy, with 38% of adults working in agriculture and 14% working in industry.[2,6] An additional impact of the increased military spending during the civil war resulted in decreased national spending on health infrastructure.[6] This lack of services contributed to accelerated and worsened health deterioration in areas most-affected by the war.[6]

Research has demonstrated that high stress and long-term grief are prevalent as a consequence of this conflict,[7] and may manifest as somatic symptoms.[8] Nearly 90.7% of respondents in 1 study reported being afraid that they might be hurt by violence, 40.7% screened positive for depression, and 50% screened positive for post-traumatic stress disorder (PTSD) in the postconflict timeperiod.[7] Distrust of organized institutions and government health care creates additional cultural barriers, contributing to underutilization of health care even when it is accessible.[9]

In addition to pain, anxiety, perceived stress, PTSD, and depression, diabetes mellitus (DM) is highly prevalent in Guatemala. Traumatic life experiences, such as civil war, are a contributing risk factor to the development of DM through chronic cortisol dysregulation.[9,10] This pathology aligns with the Guatemalan cultural concept of *susto*, a belief that a scare can trigger DM.[9] More than 80% of the global diabetic burden is in low-and middle-income countries, with Guatemala having an estimated DM prevalence of 9%–10% and with rural indigenous communities being particularly affected.[11–14]

Generalized distrust of government, challenges with access, and lack of education about therapeutic measures have led to underusing both nonprofit and government-funded health programs.[9] When patients are able to access care, they encounter locations with few resources, a lack of available medications, and unexpected fees.[9] These combined factors of underutilization and mistrust increase the need for affordable, culturally accepted, self-administered interventions for pain, DM-symptom management, and mental-health interventions. In this context, it must be noted that multiple sources from the 1990s and earlier have described acupuncture and Traditional Chinese Medicine (TCM) as being well-received in Guatemala, perhaps due to resonances with traditional Mayan medicine, which include a form of therapeutic puncture as well as herbal medicine, with some similarities in theoretical framework to TCM.[15]

Acupuncture has demonstrated efficacy for treating pain and is recommended by the American College of Physicians as a first-line intervention for acute, subacute, and chronic pain.[16] Acupuncture is also efficacious for treating anxiety, perceived stress, PTSD, and depression.[17] Additionally, acupuncture has demonstrated clinical evidence for effective DM treatment.[18] Effects seen in a previous pilot study in Guatemala include improved glycemic control, serum lipid levels, and blood pressure, as well as weight loss.[18] Improvement in these parameters decreases symptoms of DM, which include thirst, frequent urination, hunger, fatigue, and blurred vision. With such a large percentage of the Guatemalan population affected by DM, and challenged by access to primary care and the economic burden of treatment, self-administered auricular acupressure (SAAA) may be a feasible adjunct treatment for DM-related symptoms.[19] Therefore, the current authors hypothesized that SAAA might be a noninvasive and accessible alternative to acupuncture that provides an impactful response to DM type 2, physical pain, and somatic presentation of allostatic overload treatment needs.

During a health care mission, the current authors' team screened patients presenting for care; and documented patients' demographics, symptoms, and current understanding of acupuncture as a health care option. The team then trained these patients on correctly placing stickers with seeds to stimulate the acupoints with SAAA, utilizing an ear acupuncture protocol previously trialed in a pilot study in Guatemala.[20] Upon completing the training, patients received seeds and printed diagrams for personal use to manage their diabetic and other symptoms. Treatment for patients with DM symptoms was given to reduce symptom frequency and burden, while the treatment of patients who did not have DM focused on decreasing reported somatic symptoms.[20] This article details the methods, procedures, and insights gained from this initial health care mission to identify areas of future research and applications.

MATERIALS AND METHODS

This study used a pretest single-arm, exploratory design to evaluate study feasibility and acceptability. Baseline characteristics of participants were also collected. Although global health programs using acupuncture have been conducted in Guatemala since at least 1995,[21,22] to the current authors' knowledge, no studies of acupuncture delivered in this context have been published to date. The present study was designed to gather insights, establish familiarity for

later investigations, and to develop an understanding of how best to proceed in the design of future studies to be conducted during global-health projects.[23]

Setting

This 1-day clinical intervention was delivered at a Refuge International Health Clinic in the suburban area of San Raymundo, Guatemala. The San Raymundo municipality is located in the highlands, an hour by car, 32 kilometers northwest of Guatemala City. Refuge International is a nonprofit organization based in the United States that was founded in 2001. Refuge International has maintained 3 clinic locations in Guatemala for 2 decades, each delivering care during a *jornada* (Spanish for ''a day's journey'') 4 times per year. Refuge International maintains a board of directors in the United States and partners with local nonprofit community-development organizations and committees of local residents to ensure that excellent health care is delivered in a culturally appropriate and responsive manner.

Through Refuge International, many volunteers including nurse–practitioners, physicians, dentists, surgeons, nurses, translators, and ancillary personnel operate a week-long clinic in a 2-story hospital in Llano de la Virgen. Acupuncture therapy (AT) was delivered in a large room on the second floor in a group setting, with 3 cots and a reception area. Intake was provided by 2 translators, who met with each patient and reviewed consent and questionnaire items. Some patients filled out questionnaires themselves, and translators completed the questionnaires for patients who were unable to read or write in Spanish.

SAMPLE

The study sample consisted of adults who were referred for AT by their health care providers. Health care providers consisted of physicians and advanced nurse–practitioners (APRN) and APRN students who were volunteer clinicians from the United States, offering health care during a 1-week—and thus short-term—health care mission.

Procedures

Adult patients who were referred for AT were informed about AT, and asked if they were interested in receiving AT. Patients provided verbal consent because the written literacy level among indigenous Guatemalans is low.

Intervention

An acupuncturist licensed in Utah (Dr. Taylor-Swanson) provided AT to adult patients during the health-care mission. The team, which consisted of the acupuncturist, an APRN (Ms. Taylor), and a translator (Ms. Alvarez), also taught patients the locations of relevant ear acupressure points after acupuncture needles were removed. In addition, the team also provided each patient with a folder including: a photocopy of ear acupressure points with relevant points highlighted; 12 pieces of paper to track symptoms each month for a year; and a year's worth of seeds with adhesive tape to self-apply ear acupressure for symptom management. Patients were told they would be given a gift if they return to the Refuge International Clinic in a year with the 12 pieces of paper ranking their symptoms throughout each month of ear seed treatment.

AT was delivered according to each patient's presentation, with the exception of the previously developed auricular acupuncture protocol delivered for DM. The number of needles was not restricted, nor were locations. Needles were inserted between 0.25″ and 0.5″, and the De Qi sensation was sought at the practitioner's discretion based on location and point sensitivity. Needles were retained for 30–60 minutes without additional stimulation. One treatment was provided per AT session per patient, and lifestyle advice was provided on an individualized basis. The acupuncture practitioner is an LAc in the United States has a master's degree in acupuncture and Oriental medicine (MAcOM) from an accredited school in the United States, and has provided direct patient care for 22 years. No control or comparator was used in this study. Participants were asked if they experienced any adverse events (AEs), such as bruising, dizziness, or bleeding; the responses which were recorded in the patients' charts.

Data Collection

The health-care mission occurred in August 2022. Each patient met with the licensed acupuncturist, a nurse–practitioner (ET), and the translator. Patients who wished to do so filled out their demographic and baseline questionnaires. Those who did not wish to do so were assisted by the translator, who completed the questionnaires by asking the questions to the patients and then recording their responses. Upon return the team's to the United States, these data were de-identified data and entered into an Excel spreadsheet.

Instruments

A background data sheet and demographics data sheet were designed by the team and written in English. The data sheets were then translated by 2 team members (Ms. Bell and Ms. Garcia). Translation was verified by a native Spanish speaker in Guatemala, the translator. Patient treatments were documented in standard SOAP [Subjective, Objective, Assessment and Plan] note format in English by the licensed acupuncturist.

Ethics

This study was deemed exempt by the University of Utah's (Salt Lake City, UT, USA) institutional review

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board. The study was conducted in accordance with the Brocher Declaration's six principles, including: (1) mutual partnership with bidirectional input and learning; (2) empowered host country and community defined needs and activities; (3) sustainable programs and capacity building; (4) compliance with applicable laws, ethical standards, and code of conduct; (5) humility, cultural sensitivity, and respect for all involved; and (6) accountability for actions.[24]

Statistical Analysis

Analysis was performed using Microsoft Excel Office 2019 software.[25] Descriptive statistics were calculated for demographics and baseline characteristics.

RESULTS

Demographics

Eleven people received acupuncture and the majority were female (82%). All but 1 participant were employed. All women reported being housewives and all men reported being carpenters. All spoke Spanish, while 1 person also spoke Kanjobal. Most participants reported being able to read some things (55%), while 1 person was unable to read and others reported being able to read (36%). Most participants also reported being able to write (45%) or somewhat able to write (36%), and able to count (73%). Participants reported an average of just more than 4 children (age range: 2–7). See Table 1.

Baseline Characteristics

All participants reported that they experienced pain, and the majority cited problems with sleep (55%) and depression (64%). People also reported experiencing anxiety (36%) and stress (27%). One person had DM, while the majority (82%) did not have DM. A majority of participants reported that they saw health care providers (64%), including a physician or internist. Most people (73%) reported taking medications, vitamins, or supplements (73%), which included Neurobion,® vitamins, ibuprofen ($n = 2$), acyclovir, gastritis medication, high-blood–pressure medication, collagen, enalapril, medication for birth control, and aspirin. A majority (64%) reported taking herbal medicines such as tea, rosemary, ginger, alcohol rubs, lemon slices on the forehead, verbena, lime tree, chamomile, celery, cucumber, and cilantro. Most people had not received acupuncture before (64%), and 3 people reported previously receiving massage therapy (27%). Concerns about acupuncture included: (1) What type of pain is it used for?; (2) Does it

Table 1. Guatemala Patient Demographics

Demographics	*Mean (SD)*	*Range*	*Frequency (%)*
Sex			
Female	–	–	9 (82%)
Male	–	–	2 (18%)
Age	59.3 yrs (13.39)	40–81 yrs	–
Employment			
Housewife	–	–	8 (73%)
Carpenter	–	–	2 (18%)
Retired	–	–	1 (9%)
Language(s) spoken			
Spanish	–	–	11 (100%)
Anjobal	–	–	1 (9%)
Education (yrs)	4.18 yrs (4.35)	0–12 yrs	–
Able to read			
Yes	–	–	4 (36%)
Some	–	–	6 (55%)
No	–	–	1 (9%)
Able to write			
Yes	–	–	5 (45%)
Some	–	–	4 (36%)
No	–	–	2 (18%)
Able to count			
Yes	–	–	8 (73%)
Some	–	–	3 (27%)
No	–	–	0 (0%)
# of children	4.8 (1.99)	2–7	–

SD, standard deviation; yrs, years.

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Table 2. Participants' Health Characteristics at Baseline

Characteristics	*Frequency* (%)
Pain	
Yes	11 (100%)
No	0 (0%)
Sleep problems	
Yes	6 (55%)
No	5 (45%)
Anxiety	
Yes	4 (36%)
No	5 (46%)
No response	2 (18%)
Depression	
Yes	7 (64%)
No	4 (36%)
Stress	
Yes	3 (27%)
No	4 (36.5%)
No response	4 (36.5%)
Diabetes diagnosis	
Yes	1 (9%)
No	10 (81%)
Sees a healthcare provider	
Yes	7 (64%)
Type of provider	Doctor (6) Internist (1)
No	2 (18%)
No response	2 (18%)
Medications taken	
Yes	8 (73%)
List from all participants	Neurobion,®[a] vitamins, ibuprofen (2), acyclovir, gastritis medication, high blood-pressure medication, collagen, enalapril,[b] birth control, aspirin
No	1 (9%)
No response	2 (18%)
Herbs taken	
Yes	7 (64%)
List from all participants	Tea, rosemary, ginger, alcohol rub, lemon slices on forehead, verbena, lime tree, chamomile, celery, cucumber, cilantro
No	3 (27%)
No response	1 (9%)
Receive other treatments	
Yes	4 (36.5%)
Type of treatments	Massage (3) Acupuncture (1)
No	3 (27%)
No response	4 (36.5%)
If female, do you menstruate?	
Yes	4 (36.5%)
No	3 (27%)
No response	4 (36.5%)
Ever received acupuncture?	
Yes	1 (9%)
No	8 (73%)
No response	2 (18%)
Concerns about acupuncture?	
Yes	3 (27%)
List from all participants)	What type of pain is it used for? Does it hurt? How does it work?
No	8 (73%)

[a]Neurobion contains clinically proven nerve-nourishing B vitamins (B_1 + B_6 + B_{12}) that help treat symptoms of nerve damage.

[b]Enalapril is an angiotensin-converting-enzyme inhibitor used to treat high blood pressure.

hurt?; and (3) How does it work? Each question was posed by 1 participant. See Table 2.

Acupuncture Therapy

AT was provided by the licensed acupuncturist, 1 person received an ear protocol for DM,[20] and 10 people received AT according to their presenting symptoms and TCM differential diagnosis. The potential for AEs was tracked during and after AT while each patient remained in the treatment room area. However, no minor or serious AEs were reported.

DISCUSSION

Eleven patients received AT during a health-care mission in Guatemala. All participants reported having pain, and most participants reported having depression and anxiety, while few reported experiencing stress. These findings of pain and emotional distress aligned with extant data on Guatemalan health concerns in the context of the 36-year civil war.[6]

Pain has a negative impact on people's quality of life (QoL)[26] and is one of the leading causes of disability-adjusted life-years.[12] The National Institutes of Health highlights pain's effect on physical and mental activities, limiting engagement in normal life activities and affecting relationships with family, friends, and coworkers negatively.[27] In 2019, Tailor and Preston-Hsu documented particular challenges to managing back pain in women due to physiologic and hormonal changes such as pregnancy and menopause.[28] As most participants in the current sample were midlife women who reported working as housewives,

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this finding is particularly relevant. Overall, effective and affordable interventions for pain are critical for improving QoL for the workforce in San Raymundo.

Mental health is also a critical concern in Guatemala. According to the World Health Organization, ~280 million people worldwide suffer from depression, a potentially serious health condition which causes mood fluctuations and affects work and family life negatively.[29] A postconflict study from April 2009 to August 2010 in Guatemala found that 30.8% of men and 48.9% of women suffered from depression. Branas et al. posited in 2013 that prior civil war experiences, exposure to violence, PTSD and substance use may be related to poorer mental-health outcomes.[7] The current study's sample consisted of mainly women who were nearly 60 years old, who spoke Spanish, and had completed an average of 4 years of schooling. This sample's characteristics were consistent with Naber et al.'s study in Guatemala, which found that women, older people, and people with lower educational levels have higher risks of anxiety and depression.[30]

Due to a paucity of resources and available medications, plus unexpected medical fees,[9] some researchers are investigating the feasibility and effect of traditional medicine for treating diseases and pain in Guatemala. Nearly all participants in the current study took traditional herbs along with conventional medications. Although study participants had not received acupuncture before—and some questions about it were asked—these patients were not concerned about the treatment modality, suggesting that traditional medical treatment was highly accepted in this population. Altogether, acupuncture is a low-cost, culturally acceptable, effective, and safe treatment that can be provided to care for people who have pain and mental-health problems that are otherwise undertreated in Guatemala.

Limitations and Lessons Learned

A critical limitation of this project was a truncated treatment period of only 1 day, due to the licensed acupuncturist contracting COVID-19 during the trip and subsequently quarantining for the requisite 5 days. The sample size of patients treated with AT was therefore small, including only 11 individuals. This small sample mainly reflected the lack of licensed AT providers, as licensed medical professionals (physicians and APRNs) were willing to refer and patients found the treatment acceptable. In order to provide AT, a larger-scale of operations is needed, with an advance team to solicit referrals earlier and a larger number of licensed practitioners in case of illnesses or accidents.

In addition to patient acceptability, information gained from this *jornada* included a better understanding of how to work with practitioner networks. Another key insight gained was the high level of patient and provider interest in training patients to incorporate auricular acupressure in their management of pain, distress, and DM. Instruction and materials costs for this SAAA intervention are extremely low, and the project organizers were able to acquire donated supplies. The team plans to return to Guatemala later in 2023 to follow-up with patients, so it would be feasible to collect the data about the effect of acupuncture on pain and mental health for Guatemalans.

Future Work

Future work is warranted in several directions. Given findings on acceptability and feasibility from this project, larger studies of both AT and SAAA for pain and mental health concerns, and SAAA for DM are warranted. These would necessarily include collection of pre/post outcomes from patients along with Likert-type scale data in order to provide more robust quantitative data for analysis. Furthermore, other TCM modalities, such as *Ba Duan Jin*, a traditional Chinese mind–body exercise, could be taught and implemented to improve mental health through patient self-management.

CONCLUSIONS

The traumatic history of war in Guatemala—as well as mistrust and underuse of biomedicine, historical openness to acupuncture given traditional Mayan antecedents, and the existing cultural construct linking fright and DM—beg for further qualitative research on patients' baseline beliefs in relation to acceptance, experience, and outcomes with SAAA for DM as well as for emotional distress. Such research could be of considerable importance in developing culturally competent integrative approaches to this prevalent health challenge.

AUTHOR DISCLOSURE STATEMENT

No financial conflicts of interest exist.

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