Global Advances in Integrative Medicine and Health
Volume 14: 1–12
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DOI: 10.1177/27536130251321460
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Evaluating Feasibility and Acceptability of a Telehealth Integrative Pain Management Program Among Primary Care Safety-Net Patients

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Abstract

Background: The COVID-19 pandemic exacerbated pain care inequities for low-income people. The Telehealth Integrative Pain Management Program (t-IPMP) was developed to provide pain management services for patients in public health clinics of the San Francisco Health Network (SFHN). Adapted from an existing program, t-IPMP delivered multimodal pain treatment via telehealth groups when in-person healthcare was restricted.

Objective: This mixed-methods study evaluates the feasibility and acceptability of t-IPMP.

Methods: We conducted a single-arm evaluation of three cohorts of t-IPMP, comprising 12 two-hour weekly online sessions on pain education, mindfulness, therapeutic movement, and self-acupressure. Participants were adults with chronic pain referred by SFHN primary care providers. We conducted baseline surveys, three-month surveys, and qualitative interviews (n = 15); participant observation of three sessions per cohort; and 3 focus groups (n = 20). Mixed-methods analysis included descriptive statistics, pre/post comparisons using t-tests, and codebook thematic analysis.

Results: The t-IPMP received 107 referrals from 52 providers at 11 clinics, and 35% of referrals enrolled. Participants (n = 37) attended an average of 6 sessions. Participants who completed surveys (n = 15) were majority cisgender women (67%) with below-average wealth (87%) from diverse racial and ethnic identities. Qualitative data highlighted that t-IPMP created a supportive environment which fostered social connection and reduced social isolation. Social support encouraged use of new mind-body practices for pain. Telehealth was well received, though some participants preferred in-person interaction. From baseline to three-month follow up, average scores increased on measures of physical function (mean = 1.9, 95% CI 0.2-3.6); global quality of life (mean = 3.8, 95% CI 1.6-6.0); and pain self-efficacy (mean = 5.3, 95% CI 0.9-9.7).

Conclusion: Integrative, multimodal pain management delivered through telehealth groups is feasible among primary care safety net patients, however, may not be optimal for all. Findings indicate that offering options for participating either online or in-person may best address patient needs and preferences.

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Keywords
chronic pain, safety-net, integrative pain management, telehealth

Received October 7, 2024; Revised December 29, 2024. Accepted for publication February 2, 2025

Introduction

Chronic pain is one of the most common conditions in the United States, affecting one in five adults.[1-4] High-impact chronic pain, defined as pain which substantially impacts ability to perform activities of daily living, is more than twice as prevalent amongst low-income people compared with general populations over 50 years old.[1] In the aftermath of overprescription of opioid medications leading to the opioid epidemic, chronic pain treatment guidelines recommend a multimodal, biopsychosocial approach that includes non-pharmacologic therapies such as mindfulness-based interventions and therapeutic movement.[5-7] However, availability and affordability of such approaches limit access.[6,8,9]

In response to this unmet need, the San Francisco Health Network (SFHN) established the Integrative Pain Management Program (IPMP) to provide multimodal pain treatment within safety-net primary care clinics.[10] IPMP was developed as a 12-week in-person program offering group-based pain education, peer support, and non-pharmacologic therapies including mindful movement, acupuncture, and massage. IPMP initially operated at the Tom Waddell Urban Health Clinic located in the Tenderloin, the neighborhood in San Francisco with the highest number of opioid-related deaths.[11] A multidisciplinary team of clinicians developed IPMP with a commitment to patient empowerment through participation, knowledge, and skills, as well as the sustainable creation of a supportive environment. Quasi-experimental research on IPMP found statistically significant improvements in pain interference, pain intensity, social satisfaction, global mental health, and pain self-efficacy scores from baseline to 3-month follow up immediately post intervention, with no changes in the comparison group.[12] The program ran from 2016 until the onset of the COVID-19 pandemic in 2020.

Social distancing and isolation were mandated to curtail the spread of COVID-19, disrupting healthcare and social services, and exacerbating the needs of people with chronic pain. Social isolation has been highlighted as a COVID-19-related health threat to people living with chronic pain, particularly those experiencing racism and other forms of social inequality.[13-16] This is especially concerning because research indicates a bidirectional relationship between social isolation and chronic pain, with each worsening the other.[17-19] Telehealth interventions have the potential to provide an important combination of chronic pain management and social support. Virtual group visits using telehealth technology have been used in settings ranging from the Veterans Affairs to the Cleveland Clinic,[20] and their feasibility has been demonstrated for conditions including diabetes,[21,22] long COVID,[23] and chronic pain.[24,25] A variety of chronic pain management interventions in telehealth formats have been demonstrated to improve pain-related outcomes as compared with control groups. However, access to and engagement with telehealth remain challenging, particularly among safety-net populations where access to technology and digital literacy vary widely.[24,26]

In the spring of 2020, our team adapted and implemented a telehealth version of IPMP (t-IPMP) to maintain the continuity of this vital service. This study evaluates the feasibility and acceptability of t-IPMP for low-income safety-net patients with chronic pain, with a particular focus on its impact on pain management, social and emotional support, and participants' experiences with a virtual format.

Methods

Setting and Design

We conducted a single-arm program evaluation of t-IPMP, a clinical service available to patients of San Francisco Health Network (the clinical arm of the San Francisco Department of Public Health). Integrative health practitioners and co-medical leads of IPMP (VR, JW, PS, MF) adapted core components of the in-person program for telehealth delivery while maintaining a commitment to patient empowerment. We created t-IPMP as a 12-week program offered in English, with 2-hour weekly group sessions using Zoom teleconferencing. Three cohorts of IPMP are discussed in this article (one cohort included 9 sessions due to holidays and schedule challenges). Virtual group sessions were facilitated by a rotating integrative health team of three acupuncturists, two massage therapists, a trained mindfulness facilitator, and a psychiatric nurse practitioner. Sessions included pain education; therapeutic movement practices including qi gong, tai chi, and yoga; self-acupressure techniques; mindfulness practices; and self-massage. Each week, the group focused on a different pain management strategy and participants were able to interact with facilitators and peers (see Table 1). As t-IPMP was implemented, the team met weekly to review program progress, troubleshoot challenges, and iteratively adapt the program.

Participants and Study Procedures

Participants were patients of SFHN clinics who were referred to t-IPMP by their primary care providers. Eligible participants included English-speaking SFHN patients,

Table 1. Weekly Topics of the Telehealth Integrative Pain Management Program.

Week	Content
1	Orientation, understanding pain and pain management
2	Pain stories, neurobiology of pain
3	Mindfulness
4	Thoughts and pain
5	Pacing
6	Movement
7	Stress and pain
8	Emotions and pain
9	Nutrition
10	Pharmacology
11	Sleep and pain
12	Relationships and pain
13	Graduation

aged ≥18 years who experienced chronic pain for ≥3 months and were able to access the internet.

We evaluated t-IPMP using both quantitative and qualitative data. We chose mixed-methods to optimize a range of data on program feasibility, acceptability, and details of implementing telehealth for safety net patients. All data were collected via phone or Zoom at baseline, during the program, and three months after the program began. Data sources included surveys, interviews, focus groups, and participant-observation. Participants were offered a $25 gift card incentive for completing surveys, interviews, or participating in a focus group. The University of California, San Francisco (UCSF) Institutional Review Board (IRB) approved all study procedures.

Measures

Baseline data collection consisted of clinical and sociodemographic characteristics, including comorbidities, age, gender, race and ethnicity, and a measure of subjective social status (ie, self-perceived wealth compared to others in California).[27] Baseline and three-month follow-up surveys included validated measures developed by the NIH Patient Reported Outcomes Measurement Information System (PROMIS) on physical, mental, and social well-being, including pain intensity, pain interference, fatigue, physical and social functioning, anxiety, depression, and social isolation.[28-31] Measures of pain self-efficacy and sense of group belonging were also assessed.[32,33] Immediately after completing the intervention, three-month follow-up surveys also included questions on acceptability of t-IPMP, such as participant satisfaction, feedback on the program's effectiveness, convenience, capacity to provide social support, and the telehealth format. Additional metrics of program feasibility and acceptability included number of referrals, number of referring providers, number of patients enrolled, and average number of t-IPMP sessions attended.

Qualitative Data

We collected three types of qualitative data: individual interviews before and after t-IPMP, focus groups, and participant observations. Baseline interviews included open-ended questions on chronic pain experiences prior to t-IPMP participation and expectations of the program. Post-program qualitative interviews explored these and related topics such as belonging, loneliness or isolation, and changes in communication with primarily care providers. Participants were invited to focus groups facilitated by a qualitative researcher via Zoom after the conclusion of their t-IPMP to explore their group experiences, dynamics with other participants and staff, and perceptions of the program. All participants were encouraged to attend the focus group, regardless of how many sessions of t-IPMP they attended. Finally, research assistants conducted participant observation of three group sessions per cohort, as well as facilitator team meetings. For each observation, the research assistant completed a structured field note template with prompts for telehealth dynamics, group interactions, and what occurred during the session. Interviews and focus groups were recorded and professionally transcribed.

Data Analysis

NIH PROMIS assessments were calculated and converted to t-scores. Changes in quantitative measures from pre- to post-program were estimated using paired t-tests. Qualitative data were analyzed by a team of trained qualitative researchers using Dedoose software program. Using a codebook thematic analysis approach, we collaborated on the creation of a structured codebook using deductive and inductive approaches.[33,34] The codebook was developed in relationship to quantitative measures to facilitate analytical integration. For example, codes such as "Relationship to Pain – self-tracking" related to pain self-efficacy and "Psychosocial -- group dynamics" or "Psychosocial -- belonging in IPMP" related to social wellbeing and group belonging. Two researchers coded each interview or focus group transcript, and the analysis team met weekly to discuss coding processes and develop themes. Our interprofessional author team includes clinicians involved in IPMP (acupuncturists, massage therapists, psychiatrist and psychiatric nurse-practitioner) as well as researchers involved in the program evaluation (trained in integrative health, public health, sociology and medicine).

Results

The program received 107 patient referrals from 53 providers at 11 SFHN clinics. Three cohorts of t-IPMP were offered, with 37 patients attending at least one session (35% of those referred). Patients attended an average of 6 sessions; 43% attended over half of the sessions. Due to delays with IRB approval, the first cohort (n = 14) did not participate in pre/post program surveys or interviews. Of the 23 participants in cohorts two and three, 15 completed both pre- and post-program surveys and interviews (see Table 2). These participants included 10 (67%) cisgender females, 2 (20%) cisgender males, and 2 (13%) transgender individuals with a mean age of 52.5 years (see Table 2). The majority [13 (87%)] reported below-average wealth. Education levels varied with 5 (33%) reporting less than high school education and 6 (40%) reporting having a college degree or higher. Participants self-identified as 1 (7%) African American, 1 (7%) Asian or Pacific Islander, 3 (20%) Hispanic/Latine, 1 (7%) American Indian or Native American, 6 (40%) White or Caucasian, and 3 (20%) as more than one racial and ethnic group.

Table 2. Participant Characteristics (n = 15).

	n (%)
Age (years), mean ± SD	52.5 ± 13.6
Gender	
Male	3 (20)
Female	10 (67)
Transgender, genderqueer	2 (13)
Sexual orientation	
Straight or heterosexual	12 (80)
LGBTQ	3 (20)
Race and ethnicity	
Hispanic/Latiné	3 (20)
Non-Latiné African American/Black	1 (7)
Non- Latiné American Indian or Native American	1 (7)
Non-Latiné Asian or Pacific Islander	1 (7)
Non-Latiné White or Caucasian	6 (40)
More than one race	3 (20)
Educational attainment	
High school or less	5 (33)
Some college	4 (26)
Completed college or more	6 (40)
Wealth compared with others in California	
Below average	13 (87)
Average	1 (7)
Above average	1 (7)
Place of birth, not in the United States	5 (33)
Co-morbidity[a]	
Arthritis	9 (60)
Back pain	14 (93)
Cancer	3 (20)
Depression	8 (53)
High blood pressure	7 (47)
Rheumatoid arthritis	6 (40)
Ulcer or stomach disease	3 (20)

[a]Participants could select more than one option; percentages total more than 100.

Before t-IPMP: Isolation and Limited Treatment Options

At baseline, participants experienced moderate levels of pain intensity (mean = 6.4), pain interference (mean = 65.8), and anxiety (mean = 60.1, see Table 3). Baseline interviews highlighted experiences of isolation. Many participants felt socially isolated and alone in coping with their chronic pain. This was closely tied to comments about lacking confidence in relationships with healthcare providers. Participants highlighted both a deep need to feel understood and supported while at the same time hesitancy to share their pain with others. Barriers to social support for chronic pain were varied and complex including commitment to familial roles, lack of relationships that felt safe for emotional vulnerability, and self-preservation mindsets. One patient with lower back and pelvic pain which worsened after giving birth said, "I don't share with my family. I feel alone. I don't feel like they understand. Maybe there's people [in t-IPMP] that understand." The lack of relationships where some participants felt understood and believed about their pain experiences intensified feelings of loneliness and isolation. Some described masking their pain to protect other people or uphold their duties and roles. One participant who is a parent explained:

> I'm very aware that if I lose hope, I'm going to lose everything…And so that's what I do, I stay hopeful. Also, [my] children are brilliant and very keen on what's going on. And if I reek of negativity, the whole house will smell.

In navigating healthcare, many participants felt they had to be their own advocate. One participant concluded that healthcare institutions simply were not equipped with enough resources to support people with chronic pain and stated, "I don't have a doctor, someone in my life that works, that is desperately hellbent on figuring out what's going on. It seems to me that to find those people you have to find a bigger bank account." Many participants had a sense that options and answers existed, but that accessing them would require financial resources they lacked. Participants' experiences highlight the profound sense of isolation, the need for understanding and support, and the unmet needs in pain management.

Facilitating Connection and Engagement

Participant-observation of group sessions and staff meetings showed that facilitators' belief in patient empowerment shaped staff interactions with each other and decisions about the content and structure of sessions. Field notes indicated that group power dynamics during staff meetings mirrored t-IPMP facilitation strategies: staff with previous IPMP experience created a flexible, supportive space in which all staff were encouraged to share their experiences; relationship building through respectful and vulnerable communication was prioritized; and meetings closed with a reflective gratitude practice. For example, during a mid-program staff meeting for the first t-IPMP cohort, a tense situation arose as the seven staff members present discovered there was disagreement and confusion over a schedule developed in a previous meeting. While one biomedical clinician relayed the order of topics and

Table 3. Patient Reported Outcomes, Baseline to 3-Month Follow-Up.

Patient-Reported Outcome	Baseline Mean (95% CI)	3-month Follow up Mean (95% CI)	Pre/Post Difference (95% CI)[a]
Average pain intensity[b]	6.4 (5.0, 7.8)	5.7 (4.1, 7.2)	−0.7 (−2.0, 0.5)
Pain interference[b]	65.8 (61.1, 70.5)	63.2 (59.0, 67.4)	−2.6 (−5.3, 0.2)
Anxiety[b]	60.1 (54.2, 65.9)	56.1 (51.7, 60.5)	−**4.0 (-7.3, -0.6)**
Depression[b]	56.4 (51.2, 61.6)	53.8 (49.5, 58.1)	−2.6 (−7.4, 2.2)
Sleep disturbance[b]	57.4 (51.7, 63.2)	56.2 (50.0, 62.4)	−1.2 (−6.2, 3.8)
Social isolation[b]	53.9 (49.1, 58.7)	52.7 (48.1, 57.3)	1.2 (−5.8, 3.4)
Fatigue[b]	59.3 (52.7, 65.9)	60.8 (54.6, 67.0)	1.5 (−3.1, 6.1)
Physical function	36.5 (32.4, 40.6)	38.4 (35.4, 41.5)	**1.9 (0.2, 3.6)**
Social satisfaction	38.9 (32.7, 45.0)	42.4 (36.6, 48.2)	3.5 (−0.6, 7.6)
Pain self-efficacy	27.9 (20.7, 35.2)	33.2 (26.0, 40.4)	**5.3 (0.9, 9.7)**
Group belonging – connected	16.0 (13.5, 18.5)	16.9 (14.7, 19.2)	0.9 (−1.1, 2.9)
Group belonging – isolated	10.8 (8.5, 13.1)	9.8 (7.2, 12.4)	1.0 (−2.8, 0.8)
Global quality of life	14.9 (11.4, 18.5)	18.7 (15.9, 21.6)	**3.8 (1.6, 6.0)**
General health status	2.4 (1.8, 3.0)	2.9 (2.2, 3.5)	0.5 (−0.1, 1.1)
Quality of life	2.3 (1.6, 3.1)	3.1 (2.5, 3.7)	**0.8 (0.4, 1.6)**
Physical health	2.3 (1.7, 2.8)	2.9 (2.3, 3.6)	**0.7 (0.3, 1.0)**
Mental health	3.1 (2.3, 3.8)	3.4 (2.8, 4.0)	0.3 (−0.2, 0.8)
Satisfaction with social activities and relationships	2.4 (1.6, 3.2)	3.1 (2.3, 3.8)	**0.7 (0.1, 1.2)**
How well you carry out usual activities	2.4 (1.7, 3.2)	3.3 (2.7, 3.9)	**0.9 (0.1, 1.6)**

[a] Baseline and 3-month differences were compared using t-tests. Statistically significant differences ($P < 0.05$) are indicated in bold face.

[b] Lower score is more optimal.

who would lead facilitation, three integrative clinicians shared that they had previously met to discuss the remaining t-IPMP sessions and had a different understanding of the schedule, particularly that "Chinese herbs" would be a standalone session topic and not combined with the final "graduation day" session. After some confused discussion and Zoom connection interference, two biomedical clinicians acknowledged their error, apologized, and adjusted the schedule. This approach to t-IPMP development and facilitation supported the empowered engagement of all staff members, regardless of implicit hierarchy, and thus shaped how staff members navigated facilitating t-IPMP group sessions with participants.

Participant engagement with each other, facilitators, and session content increased over time. The communication practices modeled by clinician-facilitators created space for patients' pain experiences to be vulnerably shared and attended to with care while acquiring knowledge and skills to improve their pain management. Patients expressed appreciation for this in post-program interviews and one said:

> When COVID hit, we could no longer meet in person. And so, I went through several months without anyone to help… when I got [to t-IPMP], I was amazed because there were so many different ways to address the pain. It made me very excited because each one of the presenters has the therapeutic credentials to do all the things they do. We had an opportunity to learn so many things that I didn't know. And I was very excited about it because it gave me other alternative tools for pain.

Communication practices initially modeled by facilitators and adopted by participants over time included honest and often emotional sharing of personal experiences, understanding and affirming responses to the sharing of stories, and connecting personal stories to session content. Both participants and facilitators shared accessible resources and services. Over time, the weekly closing gratitude practice increasingly involved appreciation for the ways in which patients showed up for each other as well as how facilitators made participants feel heard, validated, and supported. Staff meetings across cohorts consistently included discussion and implementation of ways to support participant engagement, including connecting patients to specific resources, personalized communications to support attendance, and opportunities for staff to voice concerns over how to best support patients with difficult experiences shared during group sessions. Overall, facilitating connection within t-IPMP was driven by empowering communication practices, mutual support, and shared vulnerability modeled by facilitators and embraced by participants, fostering a collaborative and supportive environment.

Pain Management through Mind Body Practices

In focus groups and interviews, participants highlighted the program's impact on chronic pain management and access to integrative pain care. In particular, didactic lessons focusing on reframing thoughts and pacing techniques aided many participants in managing daily pain. These educational segments of the group program equipped individuals with valuable tools for pain management and provided a deeper understanding of their conditions. One said:

> Teaching us meditation, that's really helped me. It's really hard for me to sleep during the night... [meditation] helps me a lot for sleeping and also pacing, because sometimes I overwork my body...so sometimes it's more pain the next day and I always depend on medication, but now I learned something, these movements, stretching, meditation, pacing.

Mind-body practices, including mindfulness, acupressure, self-massage, and therapeutic movement, were highly valued by participants. Many participants attributed reduced pain levels to increased access to these practices which were otherwise financially inaccessible. One focus group participant who described their cohort as their "pain tribe" noted how incorporating various techniques from the program into their daily routine contributed to a reduction in their pain: "I learned about stopping, meditating and relaxing. I enjoyed doing those exercises together. Guided mediation and now I do those things. I do some meditation exercises instead of getting depressed. My pain has been lately more under control."

We observed changes in several pain-related PROMIS measures among t-IPMP participants (see Table 3). From baseline to three-month follow-up, participants had a mean increase of 1.9 (95% CI 0.2-3.6) in physical function t-scores. Overall global quality of life scores increased by an average of 3.8 (95% CI 1.6-6.0) and participants showed an increase of 0.9 (95% CI 0.1-1.6) in scores measuring ability to carry out usual activities. Pain self-efficacy increased by 5.3 (95% CI 0.9-9.7), while changes in pain interference (-2.6, 95% CI -5.3-0.2) were not statistically significant.

In the program evaluation survey (see Table 4), 93% of participants reported incorporating pain management techniques into their daily lives. Most participants (80%) reported that the program positively influenced their day-to-day functioning. Additionally, two-thirds of respondents (67%) stated that they felt better equipped to manage chronic pain and agreed or strongly agreed that "the program helped improve [their] quality of life."

Pain management through mind-body practices in t-IPMP empowered participants with accessible techniques and educational tools that enhanced their ability to manage chronic pain, improve quality of life, and integrate these practices into their daily routines.

"We are all in the Same Boat": Destigmatizing Pain via Group Support

In interviews and focus groups, participants described the program as a space where individuals felt understood and supported by peers and staff. Many participants shared that groups helped them feel less alone and destigmatized experiences of living with chronic pain—even when they had not expected this to be a benefit. One said:

> I came into the group as a naysayer, sort of. And after the first session I said to myself, 'Well let's stick this out and see where it goes.' Much to my great revelation, one of the things it provided was support from the people who work here, and community from the people who attend. And that makes a huge difference. You're not suffering alone, in silence, in your room anymore.

The group setting provided a space for sharing experiences with various pain treatments. One participant commented a sense of solidarity when hearing from people who had similar experiences:

> When you meet people with bigger or smaller issues with pain, you realize [you are] not the only one who has this. The fact that you do not feel alone very subtly changes the idea that this is something [you] have to carry on [your] own. We are all in the same boat; we just have different levels of difficulty. Knowing that you are not alone is a big, big help.

Participant interviews referenced feelings of community with t-IPMP peers, and knowledge of new techniques and modalities as contributors to mood changes and an increased sense of agency. One participant who plays music in the streets stated:

> My mood changed because I know that I have some tools to deal with the pain…On Sundays I get up and use the tools they give me…[people] like the way I play [music], so I bring them joy, [and] they bring me joy.

The emotional support provided through t-IPMP also acted to combat stigma and discrimination. One patient stated, "being a recovering addict, I always feel stigmatized. I feel that [t-IPMP] helped me know that it's okay and that many people are going through it."

Pre/post data suggest improvements in mental health and social support measures among participants (see Table 3). Anxiety levels decreased (mean change = −4.0, 95% CI -7.3 to −0.6), and participants reported increased satisfaction with social activities and relationships, with a mean change of 0.7 (95% CI 0.1-1.2). Changes in depression and social satisfaction were not statistically significant.

No notable changes were observed in general measures of social isolation or group belonging, though qualitative data highlighted t-IPMP as a safe and supportive environment, fostering connections and alleviating social isolation associated with chronic pain. Most participants (93%) felt that t-IPMP facilitators treated them with respect and considered the program a safe environment (see Table 4), and that t-IPMP was a safe space to discuss difficult topics. Additionally, 73% of respondents believed that the pain program provided emotional support. Group support in t-IPMP fostered a sense of community, reduced stigma, and provided emotional

Table 4. Evaluation of Telehealth Integrative Pain Management Program (n = 15).

	Agree/Strongly Agree N (%)
Acceptability of telehealth	
My telehealth visits were easy to schedule	15 (100)
My telehealth visits started on time	15 (100)
The practitioner I saw over Zoom explained things in a way that was easy to understand	15 (100)
The practitioner I saw over Zoom listened carefully to me	15 (100)
The practitioner I saw over Zoom spent enough time with me	14 (93)
I could see the practitioners clearly during the Zoom session	14 (93)
I could hear the practitioners clearly when they spoke to me	14 (93)
The Zoom visit was as good as an in person visit	14 (93)
I would have received better quality care if I had seen the practitioner in person	9 (60)
Zoom made it easier for me to see a practitioner today	14 (93)
Overall, I was satisfied with this telehealth visit	14 (93)
I would use telehealth services again	13 (87)
Program satisfaction	
The program helped me learn to reduce my pain.	11 (73)
I use what I learned in the pain program in my daily life.	14 (93)
The program helped improve my day-to-day functioning.	12 (80)
The program helped improve my quality of life.	10 (67)
As a result of the pain program, I feel that I am better able to manage my chronic pain on my own.	10 (67)
If the pain program were offered again, I would be interested in coming.	10 (67)
It is unlikely that I would come for additional services offered in the pain program.	3 (20)
I would recommend the pain program to other people with pain.	14 (93)
The time when the pain program was offered was convenient for me.	11 (73)
The pain program was supportive to me emotionally.	11 (73)
The other members of the group including the leaders treated me with respect.	14 (93)
The pain program was a safe place to discuss difficult issues.	14 (93)

How satisfied were you with…	Somewhat or Completely satisfied n (%)
Zoom groups	13 (87)
Movement	13 (87)
Mindfulness	11 (73)
Interactions with the providers and clinicians in the pain program	13 (87)
Overall experience with the pain program	13 (87)

support, helping participants feel less isolated and more empowered in managing chronic pain.

Telehealth: Better for Some People, Worse for Others

Through interviews and focus groups, some patients highlighted the benefits of telehealth but acknowledged a lack of deep connection and a preference for in-person interactions. One focus group participant who shared their struggle and desire for human connection commented on the limitations of a telehealth format.

> I think that a Zoom group is good to have, for some people. But I don't really feel connected with people, looking at my phone screen. And I'm more of a one-on-one type person anyways, I kind of need to be in a room with somebody, feeling their energy and being able to look at them.

Others were surprised by the effectiveness of telehealth and found themselves more engaged in discussions than anticipated. While some participants with mobility challenges appreciated the accessibility of virtual sessions, given their physical limitations, others found it challenging to sit still for long periods of time looking at a screen, or were unable to participate in movement without in-person guidance from facilitators. A participant with significant mobility constraints commented about how the virtual format supported their participation:

> As far as it being remote, it was a godsend for me because the level of pain that I have in my legs, and the level of handicap, I don't think I would've made every meeting if I had to go to the clinic. Not only because of the expense, but just because I have to go up and down stairs where I'm currently living.

Observational data from t-IPMP group sessions and facilitator meetings documented a learning curve for both participants and facilitators using videoconferencing for telehealth. Facilitators 'pinned' their videos when they were presenting content, used small group breakout rooms, and invited participants to turn their cameras on or off at their discretion. These telehealth practices appeared to support patients' ability to self-modulate engagement, build a sense of community, and facilitators' capacity to adapt group lessons for individual needs. During particularly informationally or emotionally dense portions of t-IPMP sessions, some patients would turn off their cameras, rendering it difficult to observe their engagement with the content. However, once in breakout rooms, participants would often turn their cameras back on and enthusiastically engage in discussions about what had just occurred. Similarly, it was notable that patients took it upon themselves to decide if they would turn their cameras on or off during both movement and meditation portions with variability across weeks. The subsequent discussions and closing gratitude practice for each session suggested that camera choices may have been due to feeling particularly vulnerable or preferring a more solitary practice, and participants appreciated that their choices were respected. In contrast, frequent audio issues for participants and facilitators stemmed from a combination of the lack of requests to mute audio, connection lags, coughing or similar bodily sounds, and background noise within households. Facilitators took advantage of the possibilities of telehealth to send links to services, recordings, and other resources to participants by email and chat. Most telehealth adaptation issues improved over time as participants and facilitators grew more comfortable with each other and the telehealth platform.

The evaluation survey results (Table 4) indicate a predominantly positive perception of telehealth services. 100% of respondents found telehealth visits easy to schedule and reported that t-IPMP sessions started on time. All participants felt that t-IPMP facilitators explained things clearly and listened attentively to their concerns. Nearly all participants (93%) expressed satisfaction with various aspects of telehealth, including the clarity of video and audio during sessions, and believed that their telehealth visit was as good as an in-person visit. However, 60% of participants believed that they might have received better quality care through in-person visits, suggesting that while telehealth is convenient, many perceive limitations in its ability to fully replace in-person care for chronic pain.

Telehealth in t-IPMP offered accessibility and convenience for many participants, particularly those with mobility challenges, but also revealed limitations in fostering deep connection and replicating the benefits of in-person care.

Participants' and Facilitators' Recommendations for Improving t-IPMP

During the focus groups, participants identified several potential improvements to the program. Some mentioned that t-IPMP could benefit from more tailored movement lessons that accommodate the diverse mobility capabilities of each participant. Additionally, participants suggested that staff consult a graduate of t-IPMP or IPMP for input on the most respectful and destigmatizing language when discussing pain-related topics. Group members recommended incorporating a mix of in-person and online activities for future cohorts to optimize the advantages of both formats. Facilitators recommended investing in supportive technology like web cameras and providing instructions for telehealth best practices like lighting considerations. They also suggested that patients should continue to be encouraged to participate in group services rather than prioritize individual services, and that more advocacy is needed to expand access to integrative services such as acupuncture and group-based pain management.

Discussion

In our evaluation of t-IPMP, we observed promising responses to pain management, social support, and telehealth use among patients referred from primary care safety net clinics. Interviews and focus groups underscore the integrative and comprehensive nature of the program's approach to pain management, offering participants tools and strategies for coping with chronic pain, including pain education and mind-body practices. Many participants felt respected and emotionally supported by the program and described t-IPMP as helping to reduce social isolation. Telehealth received mixed, but generally positive feedback. Some preferred in-person interactions for greater social connection and individualized guidance on therapeutic movement, while others found virtual sessions more accessible. Participants also experienced changes in measures relating to physical function, quality of life, pain self-efficacy, anxiety, and daily activity capability. In summary, our study underscores the potential of telehealth in delivering multimodal pain management and providing social-emotional support to people with chronic pain in safety-net clinics.

Previous literature demonstrates the effective and feasible adaptation of pain management group visits into telehealth formats, with high levels of patient satisfaction.[26,35-39] Studies indicate that telehealth group cognitive behavioral therapy visits can be as effective as in-person sessions,[36] and telehealth group mindfulness-based interventions can decrease pain intensity, enhance physical function, and support social roles and activities.[38] One study of telehealth pain management group visits found that therapeutic alliance and positive group dynamics predicted improvements in pain self-efficacy.[37(p20)] Our study contributes to prior literature through a focus on low-income participants and data suggesting that the benefits of telehealth-based pain management interventions extend to underserved populations.

Past studies have also highlighted the advantages of telehealth for some people with chronic pain, specifically by eliminating transportation and mobility barriers which make it difficult for this population to leave their homes.[25,35] This sentiment was expressed during focus groups and interviews by some participants. However, the view on telehealth was more mixed, with some people expressing strong preference for in-person visits. It is possible that individuals with this preference choose not to participate in t-IPMP. Our study adds to the existing qualitative data showing that telehealth group visits can provide social support,[25,39] despite a non-significant change in the social isolation measure we used. Chronic pain is a heterogeneous condition, with individuals possessing unique needs and constraints based on the nature of their pain.[2] To effectively address these varied needs, pain management programs should offer in-person, and online options, ensuring comprehensive support for this population.

Our findings highlight the potential of telehealth platforms to bridge geographic barriers and increase access to multimodal pain management programs. While virtual group medical visits demonstrate considerable promise, it is crucial to recognize telehealth's potential to exacerbate existing inequities in healthcare access.[40-42] For example, a study of an urban pain management practice found that older patients, people of color, and people with public insurance were less likely to use telehealth during the COVID-19 pandemic.[44] Other studies have demonstrated that clinics serving low-income people are more likely to use telephone-based telehealth rather than videoconferencing, and that telehealth workflows are particularly under-developed for providing care in languages other than English.[43] Equitable access to telehealth will require change at structural, institutional and clinician levels, as well as support for patients with limited digital literacy and access to technology.[45,46]

When comparing the results of this study to our team's previous research measuring patient-reported outcomes of the in-person IPMP program, we found similarities and differences that may reflect distinctions in program components, study design, or effects of time periods when the research was conducted. Pain self-efficacy measurements increased in both studies, which may be related to the program's focus on patient engagement in multimodal treatment. While the prior IPMP study showed statistically significant changes in pain interference, pain intensity, social satisfaction, and global mental health,[12] t-IPMP did not demonstrate statistically significant changes in any of these metrics. Of note, pain interference had a pre/post score mean difference of −2.6 which falls within the threshold of minimal important change, suggesting potential clinical significance.[47] These results may reflect that the participants who were able to attend t-IPMP may have self-selected out of the in-person IPMP due to high levels of pain and mobility challenges leading to higher pain interference and intensity at baseline. Additionally, individuals might have had different experiences with pain management during the COVID-19 pandemic due to lack of access to medical care, limited ability to be active, and increased need to provide caregiving. Notably, in-person IPMP provided more comprehensive, multimodal pain management services such as acupuncture, massage, and health coaching, compared to its telehealth counterpart. Our analysis of t-IPMP showed increased physical function and quality of life as well as decreased anxiety while the original IPMP study did not. Differences in anxiety, physical function, and quality of life outcomes could be attributed to the relationship between the patient empowerment focus and the unique circumstances of the COVID-19 pandemic, as mandated social distancing likely negatively impacted pain experiences and worsened social isolation.[13,15] However, these findings could also suggest that t-IPMP has different benefits than in-person IPMP, emphasizing the potential for both program formats. More research should be done to explore these differences.

The study aimed to determine the feasibility and acceptability of the t-IPMP intervention. Findings should be interpreted with caution. The small sample size and single arm design preclude any conclusions about program efficacy or causality. Additionally, variations in participants' attendance across sessions were not factored into the analysis and optimal 'dose' of the intervention is an important area for future exploration. Provider referral bias and patient self-selection may have impacted who enrolled and the study findings. Differences in qualitative and quantitative findings, specifically regarding social isolation, suggest limitations in sensitivity of quantitative measurements and warrants further exploration. Of the 23 individuals who participated in at least one session of the second and third cohort of program, 65% completed pre and post surveys. Some may have chosen not to participate due to difficulty sitting still through duration of t-IPMP visits or screen fatigue caused by the increased use of screens during the COVID-19 pandemic.[48] The specificity of the location and the variability in engagement levels highlight the need for caution when applying these results to other settings or populations. Future studies should strive to replicate these findings in more diverse and larger cohorts while considering attendance consistency to provide a more comprehensive understanding of the intervention's effectiveness and its applicability in different contexts.

This pilot is a foundation for future research with rigorous study designs and larger samples. Such studies could help evaluate the efficacy of telehealth integrative pain management programs for underserved populations experiencing chronic pain. In addition to standard patient-reported outcomes in pain research (eg, pain interference, pain intensity), measures sensitive to group processes are needed to assess social isolation and group belonging. Future research is needed to understand the benefits and limitations of virtual vs in-person integrative pain management programs, their distinct value and how to maximize the advantages of each specifically among low income, safety-net patients. This line of research should aim to increase access to multimodal chronic pain care for underserved populations, particularly those facing significant barriers to high-quality care. By advancing these efforts, we can continue to move towards a more inclusive and effective approach to managing chronic pain for those most profoundly affected by it.

Acknowledgements

The authors thank the many people who have contributed to the San Francisco Health Network's Integrative Pain Management Program (IPMP), especially Barbara Wismer and Kristina Leonadakis-Watts who launched the initial program, as well as the IPMP Steering Committee, integrative health practitioners, primary care and behavioral health clinicians, San Francisco Department of Public Health primary care leadership, research staff, and all patients who have participated in the program. We also thank Emilio Esquivel who contributed to data collection for t-IPMP.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Support for the program was provided through the San Francisco Department of Public Health and from the Mount Zion Health Fund. Authors received additional support for conducting research reported in this publication through the National Center for Complementary & Integrative Health of the National Institutes of Health under awards T35AT010592 (SB, CF, JJ) and T32AT003997 (CF, JJ), and the National Institute for Minority Health and Health Disparities award #K01MD015766 (ATL). The content is solely the responsibility of the authors and does not necessarily represent the official views of the funders.

Ethical Statement

Ethical Approval

The University of California, San Francisco (UCSF) Institutional Review Board (IRB) approved all study procedures.

Consent to Participate

All participants provided verbal consent.

Consent for Submission

All authors have reviewed and approved the submitted manuscript.

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