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Substance Use and Pregnancy – Original Research Article

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Complementary therapies in substance use recovery with pregnant women and girls

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Abstract

Objectives: Supporting women and girls who are pregnant and experiencing substance use challenges is a high priority for researchers, clinicians, and policymakers. Complementary therapies (CTs) can be effective forms of treatment in some contexts and populations; however, research on the use of CTs in substance use recovery with pregnant women and girls is scarce. To fill this gap, we conducted a mixed methods study using survey data collected at a women's recovery center in Canada. Our objectives were to describe CTs provided at the program; identify what CTs are perceived by participants as most/least positive; and explore factors that may impact participant experiences with CTs.
Methods: We analyzed feedback responses from 255 women and girls (M_{age} = 27.5 years, range 15–64) using Pearson chi-square tests, logistic regression, and inductive content analysis.
Results: The most frequently provided CTs were yoga, energy-related activities (e.g. reiki, reflexology), and meditation. Among the most common CTs, participants provided the highest endorsements for massage and physical activity, and the lowest endorsements for yoga and drumming. Across CTs, whether participants looked forward to an activity contributed significantly to whether they found it helpful, would like to do it again, and planned to continue engaging in the activity after leaving the program. Four broad contextual factors were identified that may impact experiences and perspectives about CTs: (1) *goodness of fit*, (2) *self-awareness*, (3) *growth*, and (4) *healing and holistic wellbeing*.
Conclusions: This study provides novel evidence on the potential impacts of CTs in substance use treatment for pregnant women and girls, and important contextual factors to consider when implementing these approaches.

Keywords

addictions recovery, complementary therapy, pregnancy, substance use treatment, women's health

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Introduction

Women and girls experience unique risk factors and trajectories related to substance use and heightened vulnerability to subsequent harms.[1–3] A wide range of factors may contribute to substance use concerns among women and girls, including socioeconomic disadvantage; family history; experiences of abuse, trauma, and victimization; social distress or isolation; and co-occurring challenges with physical and mental health.[4–8] Both sex and gender can influence an individual's experiences related to substance use, with biological, developmental, environmental, and sociocultural factors at play.[9] Individuals with substance use difficulties who are transgender may experience added layers of complexity and lack of tailored supports.[10,11] Importantly, gender-specific treatment approaches targeting issues that tend to be more common among women and girls may lead to increased treatment

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satisfaction and success.[1,12,13] Current best practice for substance use treatment with women and girls incorporates an understanding of their unique biological, psychological, social, and cultural needs, and consideration of how these needs may influence recovery.[14]

Aligning with this emphasis on comprehensive care, complementary approaches to therapy are emerging as a promising area in research and practice. Complementary therapies (CTs), such as meditation, yoga, acupuncture, reiki, massage, music, and art, are used in conjunction with conventional treatment to improve the overall health of the whole person, including their biological, psychological, social, and environmental wellbeing.[15] These therapies are increasing in popularity, with growing evidence of their potential to promote quality of life and physical and mental wellbeing, including in the management of substance use.[15–22]

Substance use and pregnancy

The negative impacts of substance use during pregnancy on the health and wellbeing of both a parent and child are well-established.[23,24] However, pregnant women and girls face numerous barriers to accessing mental health and substance use treatment, such as stigma, fear of punishment, and lack of specialized care.[25–28] Therefore, pregnant women and girls are a priority population in substance use research, practice, and policy.[4,29] Most evidence-based substance use treatment approaches for pregnant women and girls involve brief and behavioral interventions such as cognitive behavior therapy or motivational interviewing,[23,30] and many are rooted in harm reduction models. Harm reduction focuses on minimizing the negative impacts of substance use while at the same time supporting women and girls to meet their immediate needs.[31] Harm reduction approaches to working with pregnant women and girls are believed to improve engagement and retention in programming, increase connection to other services during and after birth, reduce substance use and health care costs, and improve outcomes for both parent and child.[8,31] Given the holistic and wellbeing-oriented focus of harm reduction models, and the complex needs of pregnant women and girls who experience substance use challenges, CTs may be particularly helpful for supporting recovery in this population.

The 2nd Floor Recovery Center

The 2nd Floor Recovery Center is an innovative live-in substance use treatment program serving women, girls, and gender diverse people who are experiencing substance use and are, or are likely to become, pregnant. Priority for treatment is given to women and girls who are pregnant and engaged in substance use, followed by women and girls who are of childbearing age and using substances without any form of contraception, then women beyond the childbearing years who are using substances. Treatment at the 2nd Floor Recovery Center is rooted in a harm reduction model focused on clients' physical, mental, emotional, and spiritual wellbeing. The broad goals of 2nd Floor Recovery Center programming are to support clients' health and wellbeing and reduce the incidence of alcohol-exposed pregnancies. Programming involves individual and group counseling and life skills training for maintaining sobriety and living life without substance use. Alongside these conventional treatment approaches, the 2nd Floor Recovery Center or also offers numerous CTs.

Current study

This study was conducted to fill a gap in the literature on the potential impacts of CTs for women and girls who are (or are likely to become) pregnant and impacted by substance use challenges. The broad aim of the study was to explore participants' experiences, perceptions, and perceived impacts of CTs offered at the 2nd Floor Recovery Center. Specific research questions included the following:

Research Question 1 (RQ1). What complementary therapies are provided at the 2nd Floor Recovery Center?

Research Question 2 (RQ2). What types of complementary therapies do participants perceive most/least positively?

Research Question 3 (RQ3). How do participants' past experiences with and expectations about CTs impact their current perceptions?

Research Question 4 (RQ4). What contextual factors may impact participants' experiences, perceptions, and perceived impacts of CTs?

Because of the exploratory nature of this research and the unique study population, we did not have any pre-established hypotheses about what specific types of CTs would be perceived more or less positively. However, we hypothesized that if participants had previous experience with a particular CT and looked forward to the activity, they would perceive it more positively than participants without past experience or positive expectations.

Methods

This research was a mixed methods study using survey responses from the 2nd Floor Recovery Center to characterize the CTs provided at the Center and explore participants' perspectives, experiences, and perceived impacts of CTs. We followed O'Cathain and colleagues' guidelines for good reporting of a mixed methods study (GRAMMS).[32] Ethical approval for this study was obtained through the

University of Alberta Research Ethics Board (Study ID Pro00112514).

Consent for data collection and use was obtained at the time of program intake. The consent process is completed with an intake coordinator, who verbally reviews the consent form with each client to ensure understanding before written permission is obtained. The consent form explicitly notes that (non-identifying) data collected through the program may be used in research, evaluation, and program improvement. A case coordinator also explains the consent form again before any specific surveys or documents are completed by a client.

Data collection

As part of regular programming at the 2nd Floor Recovery Center, participants provide feedback about specific CTs they complete during treatment. For this study, we analyzed feedback data collected between October 2013 and June 2021. From 2013 to 2020, feedback was collected on paper by program staff, and from 2020 onward, clients entered their feedback directly into an online platform (Google Forms) assisted by program staff. A total of 1380 responses were collected.

The feedback survey includes both closed- and open-ended items (see Appendix 1). Closed-ended questions gauge participant perspectives (categorically) about whether the CT was a positive experience (yes/no/neutral), whether the participant had done the activity before (yes/no), would do it again (yes/no), looked forward to the activity (yes/no/unsure), felt that it helped them (yes/no/unsure), and would continue to do it after leaving the program (yes/no/unsure). Participants also provide open-ended responses about how the activity made them feel (and why), and why or why not they would continue to engage in CT activities after leaving the program.

Participants

Responses from a total of 255 women and girls were analyzed for this study. The average age of participants was 27.5 years (range 15–64). Although data on pregnancy status and other complex needs were not collected for the purpose of this study, overall program statistics indicate that, since program inception, 27.4% of clients were pregnant at intake. Additional complex needs of clients include confirmed or possible FASD (72.5%), other co-occurring mental health needs (71.9%), and involvement in sex work (20.7%). The average length of stay at the 2nd Floor is 42 days.

Data analysis

Quantitative analyses for this study were conducted in R version 4.1.0 via the stats package (version 3.6.1) and IBM SPSS Statistics version 27 for Mac. The statistical R package used was rpart.[33] Descriptive statistics were used to characterize and quantify the range of activities provided at the 2nd Floor Recovery Center (RQ1). Additional quantitative analyses were conducted for activities with more than 20 responses (art, drumming, energy-related, massage, meditation, movement, and yoga; see Appendix 2 for full description of all CTs). To examine participant perceptions about specific activity types (RQ2), Pearson chi-square tests were used to analyze responses to five questions: "Was it positive?"; "Did you look forward to this activity?"; "Would you like to do this activity again?"; "Did this activity help you?"; and "Will you continue to do this activity?." Statistical significance was set at $p < .05$ (with Bonferroni correction for multiple comparisons) and Cramer's V reported for effect sizes.

To examine whether participants' past experiences with and expectations about CTs impacted their current perceptions (RQ3), we conducted a series of multiple generalized binomial logistic regression analyses with the most common CTs (art, drumming, meditation, energy-related, and yoga). Independent variables were whether a participant (1) had previous experience with the activity and (2) looked forward to the activity. Dependent variables were whether they (1) perceived a CT to be helpful, (2) would like to do it again, and (3) planned to continue the activity after leaving the program. A total of 28 models were analyzed for the five activities and three dependent variables (two dependent variables for meditation due to low endorsement).

For additional context around participant experiences, perceptions, and perceived impacts of CTs (RQ4), we analyzed open-ended responses via a qualitative descriptive approach[34] using inductive content analysis.[35] This approach was used to provide a comprehensive and condensed descriptive summary of participant feedback, and identify common categories derived from the data. Following Elo and Kyngäs' approach,[35] two authors (KF and IR) independently coded all participant responses (open coding), generating code sheets to describe data at their most basic level. The authors then compared their code sheets, collaboratively resolved any discrepancies to ensure concordance, grouped together similar codes, and generated higher order categories that described trends in the data (categorization). Finally, the same authors formulated a broad description of identified concepts as they pertained to our research questions (abstraction). We initially began the qualitative analysis process by coding and categorizing the two open-ended questions separately. However, as analysis progressed, it became apparent that there were many parallels in participant responses across questions. Therefore, during abstraction, we merged the two sets of participant responses to describe overarching patterns. At the final stage of abstraction, the first author

Table 1. Participant feedback on complementary therapy activities.

N = 1172	%	Positive (*n* = 1088)	Done before (*n* = 1135)	Like to again (*n* = 1125)	Look forward (*n* = 1116)	Helpful (*n* = 1108)	Will Continue (*n* = 1083)
Yoga (*n* = 298)	25.4	191 (68.0)	236 (81.9)	209 (72.8)	177 (62.3)	210 (73.2)	145 (52.7)
Energy-Related (*n* = 187)	16.0	133 (83.1)	83 (47.2)	162 (93.1)	154 (89)	157 (92.4)	105 (62.5)
Meditation (*n* = 135)	11.5	99 (78.0)	103 (77.4)	118 (90.8)	107 (81.7)	116 (89.2)	83 (67.5)
Drumming (*n* = 126)	10.8	88 (75.9)	89 (71.8)	101 (82.8)	86 (71.7)	91 (77.8)	52 (43.3)
Art (*n* = 119)	10.2	91 (82.0)	95 (84.1)	101 (90.2)	92 (84.4)	98 (90.7)	83 (77.6)
Massage (*n* = 110)	9.4	93 (89.4)	68 (63.6)	103 (97.2)	99 (94.3)	97 (95.1)	81 (82.7)
Movement (*n* = 54)	4.6	42 (80.8)	43 (84.3)	50 (96.2)	43 (86)	49 (94.2)	43 (86)
Self-Care (*n* = 20)	1.7	19 (82.6)	16 (80.0)	18 (90.0)	20 (100)	19 (95.0)	18 (90.0)
Volunteer/Outreach (*n* = 19)	1.6	13 (76.5)	15 (78.9)	16 (84.2)	15 (78.9)	16 (84.2)	11 (61.1)
Movie (*n* = 19)	1.6	14 (82.4)	18 (94.7)	19 (100)	18 (94.7)	18 (100)	18 (94.7)
Nature (*n* = 18)	1.5	11 (61.1)	15 (78.9)	16 (84.2)	15 (78.9)	15 (78.9)	11 (61.1)
Life Skills (*n* = 14)	1.2	12 (85.7)	10 (71.4)	13 (92.9)	13 (92.9)	14 (100)	12 (85.7)
Crafts/Games (*n* = 14)	1.2	12 (85.7)	10 (76.9)	12 (85.7)	11 (78.6)	12 (85.7)	9 (64.3)
Other Cultural (*n* = 10)	0.9	8 (80.0)	4 (40)	9 (90)	8 (80)	10 (100)	7 (70)
Reading (*n* = 9)	0.8	6 (66.7)	8 (88.9)	8 (88.9)	8 (88.9)	7 (77.8)	7 (77.8)
Iridology (*n* = 9)	0.8	8 (100)	1 (11.1)	9 (100)	8 (88.9)	9 (100)	6 (66.7)
Animal (*n* = 7)	0.6	6 (85.7)	5 (71.4)	7 (100)	6 (85.7)	6 (85.7)	4 (57.1)

(KF) explored whether certain categories were more or less closely linked to specific types of CTs.

Quantitative and qualitative data were analyzed separately and then integrated during our interpretation of findings before final conclusions were made. The integration process was primarily led by one author (KF) and reviewed by two additional authors (IR and BO).

Results

Complementary therapies provided at the 2nd Floor Recovery Center

To characterize the scope of CTs offered at the 2nd Floor Recovery Center, a total of 1172 from the original 1380 responses were examined (98 were excluded because they combined multiple activities in one response, 92 were responses about conventional therapies such as counseling or group therapy, and 18 were excluded because the activity type was not specified). Responses were most often provided for yoga ($n = 298$, 25.4%); energy-related activities ($n = 187$, 16%); meditation ($n = 135$, 11.5%); drumming ($n = 126$, 10.8%); and art therapy ($n = 119$, 10.2%). Participants had previous experience with most CT activities; however, several activities (iridology, cultural activities, and energy-related activities) were new to more than half of participants. See Table 1 for full findings related to the scope of activities.

Perceptions about CT types

For activities with more than 20 responses (art, drumming, energy-related, massage, meditation, movement, and yoga), Pearson chi-square tests revealed significant differences across CTs in terms of whether participants described them as positive experiences, $\chi^2(6, N = 837) = 27.750$, $p < .001$, $V = .182$; wanted to do them again, $\chi^2(6, N = 982) = 70.123$, $p < .001$, $V = .267$; looked forward to them, $\chi^2(6, N = 964) = 77.207$, $p < .001$, $V = .283$; found them helpful, $\chi^2(6, N = 961) = 60.645$, $p < .001$, $V = .251$; and would continue to do them after leaving the program, $\chi^2(6, N = 851) = 80.065$, $p < .001$, $V = .307$. Participants consistently provided the highest endorsements for massage and movement, and the lowest endorsements for yoga and drumming (see Table 1).

Past experiences and expectations

A total of 681 responses were examined through logistic regression to determine whether past experience and expectations about CTs were associated with current perceptions; 329 cases were excluded due to being under-subscribed (selected < 7 times) or unbalanced (disproportionate yes/no responses) activities, 259 cases were excluded due to missing responses, and 111 had non-binary responses. These analyses revealed that although past experience with CTs had no impact on current experiences or perceptions (all $ps > .05$; Table 2), for all five activities (art, drumming, energy-related, meditation, and yoga), participants who looked forward to an activity were significantly more likely to perceive the activity to be helpful, want to do it again, and plan to continue doing it in the future (Table 3).

Contextual factors

Through our analysis of open-ended survey responses, we identified four broad concepts related to contextual

Table 2. Logistic regression models predicting whether past experiences with complementary therapies impact current perceptions.

	Pseudo R^2	β	*SE*	95% CI	*p*
Yoga (*n* = 242)					
Helped	0.61	1.00	0.52	0.02, 2.07	.052
Again	0.66	0.69	0.54	–0.34, 1.79	.203
Continue	0.62	0.67	0.52	–0.37, 1.69	.201
Drumming (*n* = 99)					
Helped	0.56	1.48	0.77	0.02, 3.14	.056
Again	0.59	0.89	0.81	–0.65, 2.60	.268
Continue	0.20	0.39	0.52	–0.64, 1.42	.455
Art (*n* = 95)					
Helped	0.52	–0.56	1.09	–2.90, 1.45	.604
Again	0.55	1.47	0.97	–0.47, 3.41	.129
Continue	0.27	0.60	0.78	–1.05, 2.06	.443
Meditation (*n* = 100)					
Again	0.53	–0.15	1.02	–2.25, 1.80	.879
Continue	0.31	–0.13	0.76	–1.79, 1.25	.868
Energy-related (*n* = 145)					
Helped	0.47	–0.62	0.91	–2.66, 1.10	.493
Again	0.48	0.47	0.97	–1.44, 2.59	.631
Continue	0.11	–0.42	0.39	–1.20, 0.34	.283

CI: confidence interval.

Table 3. Logistic regression models predicting whether expectations of complementary therapies impact current perceptions.

	Pseudo R^2	β	*SE*	95% CI	*p*
Yoga (*n* = 242)					
Helped	0.61	4.08	0.51	3.16, 5.20	.000
Again	0.66	4.40	0.52	3.48, 5.53	.000
Continue	0.62	3.92	0.41	3.15, 4.78	.000
Drumming (*n* = 99)					
Helped	0.56	3.74	0.72	2.46, 5.33	.000
Again	0.59	4.16	0.83	2.72, 6.13	.000
Continue	0.20	1.89	0.52	0.91, 3.00	.000
Art (*n* = 95)					
Helped	0.52	4.43	1.07	2.53, 6.87	.000
Again	0.55	3.70	0.96	1.95, 5.83	.000
Continue	0.27	2.45	0.74	1.03, 3.99	.001
Meditation (*n* = 100)					
Again	0.53	4.51	1.22	2.44, 7.62	.000
Continue	0.31	3.00	0.76	1.60, 4.66	.000
Energy-Related (*n* = 145)					
Helped	0.47	4.24	0.89	2.66, 6.29	.000
Again	0.48	4.03	0.90	2.43, 6.08	.000
Continue	0.11	1.96	0.60	0.84, 3.22	.001

CI: confidence interval.

factors around participant experiences, perceptions, and perceived impacts of CTs: (1) *Goodness of Fit*, (2) *Self-Awareness*, (3) *Healing and Holistic Wellbeing*, and (4) *Growth.* These concepts were relevant across participant responses and spoke both to their perceptions about how CT activities made them feel, as well as to perceived barriers and enablers to engaging in CT activities in the future (see Figure 1 for a full illustration of the abstraction process).

Within the concept of *Goodness of Fit*, participants discussed the match (or lack thereof) between CT activities and their individual preferences, abilities, and circumstances. Many participants noted that activities were generally *well-matched*, explaining that they "make me happy" or were "the best part of my day." These positive responses were most often associated with art and movement activities. In contrast, participants also reported on the ways in which they had difficulty fully *engaging* in some CT activities. Some participants perceived activities to be confusing, boring, or burdensome, and others experienced physical barriers such as chronic pain or the physical limitations associated with pregnancy that prevented them from fully participating in or benefiting from some activities. Relatedly, some participants reported that activities caused emotional and/or physical *discomfort*, ranging from "awkward," "annoying," and physically uncomfortable or painful, to more intense negative responses such as aggravation and anger, with one participant noting she "hates it." Challenges with engagement and discomfort were most often described in relation to yoga and drumming. For some participants, goodness of fit related to whether the activity matched their *priorities*. For instance, although some participants described activities as "not something I would make time for," others noted that certain activities "fit into my lifestyle" and are "already something I do at home." Finally, we identified a category of responses related to *logistical factors* that influenced goodness of fit, particularly when participants discussed whether they would continue activities in the future. Most often, logistical barriers related to financial cost, with many participants noting that they "can't afford it" or "it's probably too expensive for me." Other logistical factors included lack of time, materials, and availability/opportunity in their home communities, or systemic influences such as mandatory requirements of their treatment programs. These more practical elements related to goodness of fit were most relevant for drumming and energy-related activities.

Participants shared many perspectives about the ways in which CTs influenced their *Healing and Holistic Wellbeing*. Many participants noted that CTs, especially message, meditation, and energy-related activities, helped them to *release* negative emotions or tension, reporting, for example, that "it was like an internal cleanse that took out all the negative thoughts and feelings." Many participants discussed CTs in terms of *body-based* impacts on wellbeing, though mixed responses were identified. Participants reported that some activities, like massage and yoga, made them more physically flexible while others

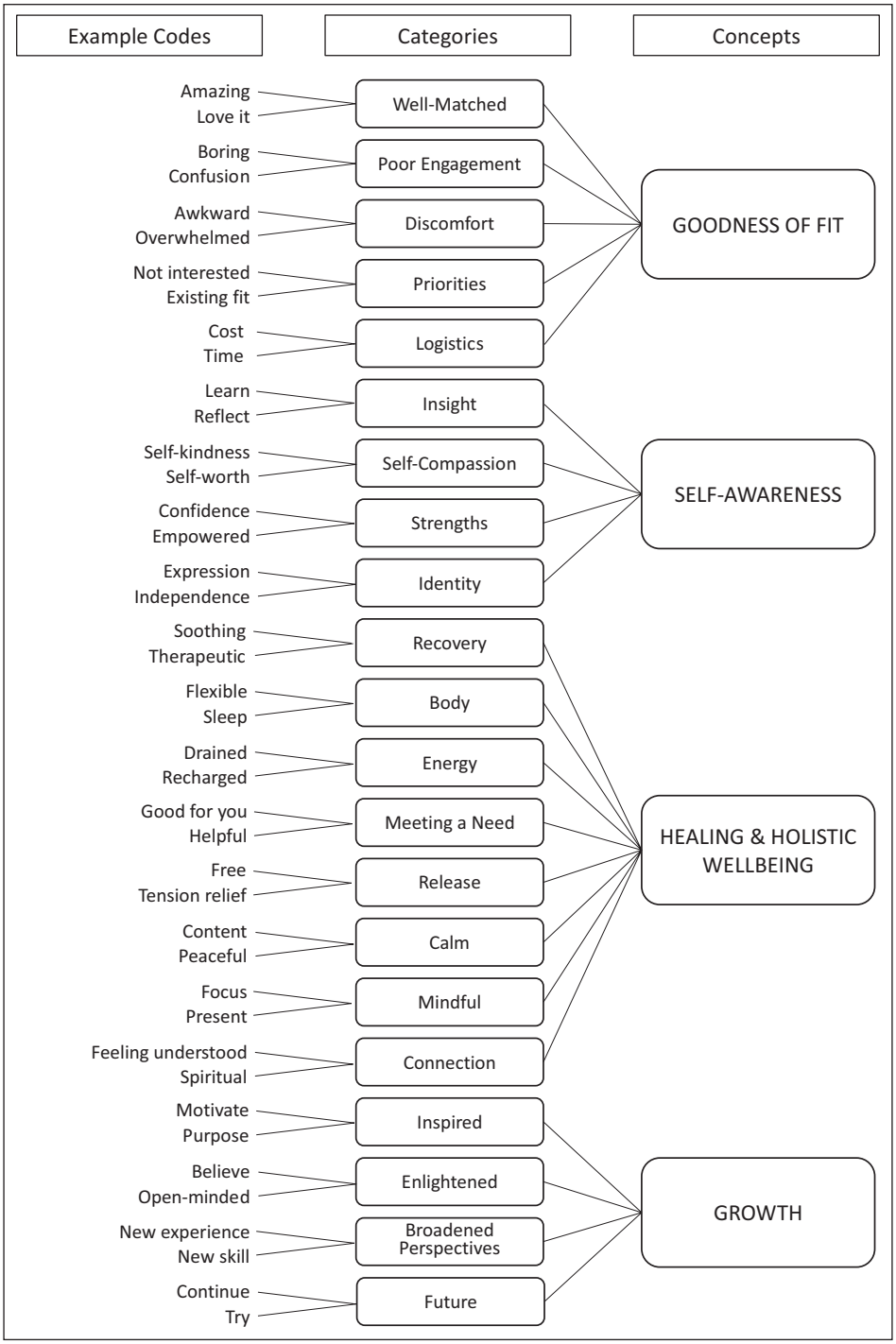

Figure 1. Concepts related to participants' experiences with and perceptions of complementary therapies.

"gave me a headache" or were unpleasant because participants "didn't like being touched." Participants noted that activities supported their *recovery*, with soothing or therapeutic effects on their physical (e.g. "it soothed my back"), emotional (e.g. "a lot of emotions come up because of the hurt I feel and it was about healing a part of our body, mine was the heart"), and mental (e.g. "it helps heal the mind") pain. These therapeutic experiences were most often described for meditation and massage. Another category of responses included the ways in which CTs, particularly meditation and energy-related activities, impacted participants' *sense of energy*. Some activities were reported to make participants feel tired, "exerted," or "drained," whereas other activities made them feel "refreshed," "exhilarated," and "alive." CT activities were described in terms of *meeting a need*, for example, as being "something

I really needed," especially with respect to massage. Participants also reported gaining a sense of *calmness*, explaining that certain activities, particularly meditation, were relaxing and made them feel "at ease," "content," or "peaceful." Similarly, participants described mixed perspectives around the impacts of activities on their sense of *mindfulness*, explaining that some activities "help to clear my mind" or made them feel "in control of my thoughts," while others noted that some CTs "made me think too much." These experiences were most often described in relation to meditation and yoga. Finally, some participants' experiences with CTs were described in terms of their *connections*, in relationship, with nature, and to a higher sense of spirituality. This sense connection was often reported for energy-related activities and community outreach. Some participants explained that they would continue to engage in CTs activities after discharge because they could "get their kids involved." Other participants described their connection with nature, reporting that they enjoyed the "fresh air" involved with certain activities as well as their connection to "mother earth."

The next broad concept identified in our analysis was *Self-Awareness*, which related to participants' experiences of increased self-reflection, learning, and understanding. Participants commonly described gaining *insight*, noting that CT activities often helped them to reflect on their past and present experiences and learn more about themselves. This increased insight was especially linked to energy-related activities. One participant explained that certain activities "helped me identify what parts of my inner self needed work." Participants also described their experiences with CTs in relation to *self-compassion*, which involved their sense of self-worth and self-kindness, and for some participants, prioritizing self-care: "I think it's very important to take care of yourself." Similarly, many participants discussed CTs in relation to enhancing personal *strengths*, describing how engaging in some activities, particularly drumming and art, impacted their sense of self-confidence, empowerment, pride, and independence. Participants also explained how CT activities related to their *identity*, such as providing opportunities for creativity, which made some participants feel "free to express" themselves; these experiences related to personal expression were again most often linked to drumming and art. Similarly, some participants associated CT activities with their cultural identities, noting that certain activities helped them to "connect with my culture."

The final concept involved participants' experiences of *Growth*. Certain CT activities, especially art and community outreach, were discussed in terms of how they *inspired* participants, making them feel encouraged, enthusiastic, and motivated: "it gives me a purpose, something to do." Similarly, participants' responses reflected a sense of *enlightenment*, especially with respect to cultural activities. For example, one participant noted that some activities "made me believe." Participants also discussed how CT activities *broadened their perspectives* by providing new experiences and skills, particularly around art, crafts, and energy-related activities. However, reactions to broadening perspectives varied across individuals. For example, one participant noted that her experience with some CTs were "really awesome . . . made me think from a different perspective," whereas another participant expressed certain activities were a "little uncomfortable" because she "never did it before." Relatedly, some participants discussed the ways in which CT activities might fit in their *futures*, often with a focus on self-care. For instance, participants noted that they will "keep working on me," and that continuing to engage in certain activities would "greatly benefit me in the future."

Discussion

Increased attention has been paid over the last several decades to sex- and gender-based factors in substance use treatment utilization, needs, and impacts. Women and girls often experience unique barriers to substance use treatment compared to men and boys, because of perceived stigma, lower education levels, economic disparity, and poorer social support.[1] Added layers of risk and vulnerability exist for women and girls who are pregnant, such as adverse pregnancy and birth outcomes associated with prenatal substance use, as well as limited access to specialized substance use treatment and care for pregnant people.[23] As such, there is a critical need for timely, high-quality, and effective substance use interventions to support women and girls' health and wellbeing before, during, and after pregnancy. Given the complexity of needs experienced by women and girls who are pregnant and using substances, harm reduction approaches, which comprehensively consider the health, safety, social, and economic needs of this population are especially promising.[31] Relatedly, an emerging body of literature supports the effectiveness of CT approaches in substance use treatment broadly,[36] and CTs may be especially beneficial for women and girls, possibly due to differing goals, preferences, and co-occurring needs.[37,38] However, to our knowledge, no studies have yet been conducted to explore the experiences of pregnant women and girls or their perceived impacts related CTs within the context of substance use treatment.

In this study, we analyzed nearly 1200 responses from 255 women and girls who engaged in CT activities at the 2nd Floor Recovery Center. Activities most often completed by participants were yoga, energy-related activities, meditation, drumming, art, and massage therapy; those most positively endorsed were massage therapy and movement-based activities, such as walking, swimming, and other forms of physical activity. These findings underscore the unique importance of considering the body-based needs of pregnant women and girls with substance use challenges,[20]

and align with the growing evidence of the positive influence of physical activity in substance use treatment.[36,39–41] These findings also align with harm reduction approaches for pregnant women and girls, which often incorporate consideration of nutrition, movement, and overall physical health and wellbeing.[8] Participants in this study responded less positively to yoga, which contrasts previous findings in the broader literature about the benefits of yoga during pregnancy[42] as well as its potential utility in the management of substance use.[43,44] When discussing some of the barriers or challenges with CTs, participants in this study often described physical discomforts that negatively impacted their experiences with yoga, again highlighting the importance of considering the unique body-based needs of this population. Additional insight into the relevance of body-based factors in substance use treatment may be derived from the emerging literature on "bottom-up" treatment approaches which target somatic experience as opposed to "top-down" approaches targeting cognition and thought processes. These approaches may be especially helpful for improving mind-body connection[20] and supporting individuals with histories of trauma.[45]

Regression analyses indicated that whether participants looked forward to a CT significantly influenced whether they found it helpful and would do it again. In parallel, participants open-ended feedback suggested that poor engagement was often a substantial barrier to positive experiences, perceptions, and perceived impacts of CTs. Together, these findings indicate that, regardless of the specific type of therapy activity, participant engagement and goodness of fit play pivotal roles in perceived effectiveness. Similarly, efforts to improve participant buy-in and motivation will be important for supporting recovery for pregnant women and girls, as has been shown in other populations.[46–48] Moreover, findings about participant engagement align with the literature in human motivation and self-determination, whereby fulfillment of needs related to individual autonomy, competence, and relatedness support psychological wellbeing.[49] Notably, one of the focal points of harm reduction is an emphasis on an individual's right to autonomy and self-determination,[50] and approaches that are both responsive to an individual's lived experience and contextually relevant may be especially important.[51] This emphasis on respect, responsiveness, and personal meaningfulness likely support engagement in substance use treatment and may account for the increased retention of pregnant people in substance use treatment delivered through a harm reduction approach.[31] Our findings add further evidence for the necessity of establishing goodness of fit between treatment modality and an individual's needs, priorities, and circumstances in substance use treatment contexts.

Participants also provided rich descriptions of the ways in which CTs may lead to healing and recovery, such as increasing self-awareness and facilitating experiences of personal growth, thus shedding additional light on potential roles that CTs may play within treatment. Findings related to participants' feeling inspired, purposeful, and enlightened; and experiencing broadened perspectives and future orientation, align with harm reduction models, which emphasize individualized and evolving goals, increased coping skills, relapse prevention, and self-efficacy for future change.[52] Similarly, inspiration, purpose, and future orientation also align with the literature on growth mindset, which may further contribute to human engagement, motivation, and wellbeing.[53] Importantly, growth mindset has been shown to relate not only to lower levels of psychological distress but also increased treatment value and coping,[54] thus emphasizing the importance of considering mindset in substance use intervention approaches. These findings again speak to the broad and powerful benefits that CTs may provide for pregnant women and girls impacted by substance use challenges, and mirror other research on the meaningful impacts of holistic and individualized wrap-around programs that address the complex needs of this population.[55]

Strengths, limitations, and future research

This study offers a novel and important contribution to the literature with several notable strengths. In particular, this is the first study, to our knowledge, to explore the use of CTs in substance use treatment for women and girls who are (or are likely to become) pregnant. The large sample size allows for robust conclusions about types of activities that may be helpful for this population, as well as factors that may influence treatment satisfaction and impacts. Our mixed methods design allowed us not only to identify CTs that may be especially beneficial for pregnant women and girls, but also share a rich account of *why* and *how* CTs may be helpful, thus providing evidence for potential ways in which CTs may play a role in substance use treatment.

Despite these strengths, the study was also limited in a number of ways. Because the data was de-identified before being shared with the research team, our understanding of participant characteristics was limited. For example, we did not know the ages of participants and were therefore unable to examine differences in the experiences of adolescents versus those of adults. We were also unable to examine whether experiences differed between participants who were pregnant versus those who were not, or how complex needs (e.g. FASD diagnosis, trauma history, other physical and mental health diagnoses) impacted client experiences. Moreover, because we could not identify individual participants, we were unable to examine sequential responses and identify changes in perspectives over time. In future research, various demographic (e.g. age group, ethnicity, marital status, socio-economic status), clinical (e.g. co-occurring physical or mental health concerns, history of trauma), and socio-environmental (e.g.

residential stability, urban versus rural location, criminal justice involvement) factors should be investigated in terms of whether and how they may impact needs and treatment outcomes. Moreover, although our study did not include any gender diverse participants, considering that transgender individuals likely have unique experiences with respect to substance use and addictions treatment,[56] more research is needed to tease apart gender-based factors as they relate to CTs in recovery.

Additional methodological limitations related to reliability and validity include the fact that we relied on self-report data. Moreover, this study lacked a control group of participants who completed conventional therapy alone, and although participants were directly asked about their experiences with CTs, it is nonetheless impossible to tease apart the unique impacts of CT versus conventional intervention approaches that clients would have been engaged in simultaneously. The location of the 2nd Floor is a relatively small rural community in Western Canada, which limits generalizability of results to other geographic regions. There was also a large amount of missing data in some regression analyses. In addition, we did not conduct a power analysis because this was a retrospective study, and we did not plan (ad hoc) for a specific minimum sample size. Rather, we included all data available for analysis. Moreover, this cross-sectional study precludes any conclusions about long-term impacts of CTs. Future longitudinal research is needed to explore trajectories among pregnant women and girls with substance use challenges, to identify promising approaches to treatment and other protective factors for supporting healthy outcomes.

Conclusion

The 2nd Floor Recovery Center is an innovative treatment program with a harm reduction philosophy designed to support women and girls who are (or are likely to become) pregnant and experiencing substance use challenges. According to the findings of this study, complementary therapies, particularly those that address body-based needs, are largely well-received by this population. Regardless of the specific treatment modality, it is clear that individualized, wrap-around, and holistic approaches are necessary to address the diverse needs of this population. Participants in this study shared important perspectives around positive impacts and notable challenges that will help to guide future work in substance use research, practice, and policy, and deepen our understanding and capacity to support long-term health and wellbeing for women and their families.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Author contribution(s)

Katherine Flannigan: Conceptualization; Formal analysis; Writing – original draft; Writing – review & editing.
Bryce Odell: Conceptualization; Formal analysis; Writing – original draft; Writing – review & editing.
Imad Rizvi: Formal analysis; Writing – review & editing.
Lisa Murphy: Conceptualization; Writing – review & editing.
Jacqueline Pei: Conceptualization; Writing – review & editing.

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Supplemental material

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