Chapter 10
Perspectives on Healing and Recovery from Addiction with Ayahuasca-Based Therapy Among Members of an Indigenous Community in Canada

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Introduction

This chapter is based on an observational research project that assessed the impact of ayahuasca-based therapy on addiction and other substance use-related outcomes among members of a rural Indigenous community in Western Canada. These quantitative and qualitative findings summarize the lived experiences of participants and shed light on how and why ayahuasca delivered in a ritualized retreat setting influenced healing and recovery from addiction and overall psychosocial well-being.

Indigenous peoples in Canada and globally experience a disproportionate burden of social and health-related problems that are the legacies of Euro-American colonialism, racialized policies, and consequent territorial and cultural dislocation. Experiences of multigenerational trauma, including concurrent mental health and substance use disorders—with significant heterogeneity across settings and subpopulations—remain of critical concern, despite decades of ongoing intervention efforts (Chansonneuve 2007; Gracey and King 2009; Health Canada and Assembly of First Nations 2015). Conventional approaches to treating addictions have had limited success in breaking the formidable barriers to health and well-being faced by many Indigenous people who continue to experience the consequences of devastating disconnection from traditions, culture, language, and spirituality (Chansonneuve 2007; Gracey and King 2009).

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Ayahuasca is among various psychedelic substances demonstrated to have potential therapeutic benefits in both nonclinical and clinical settings (dos Santos et al. 2016; Johnson et al. 2017; Sessa 2012; Tupper et al. 2015). The Amazonian plant brew, typically made from plants containing harmala alkaloids (*Banisteriopsis caapi*) and dimethyltryptamine (*Psychotria viridis*), has a vibrant history of social, cultural, and medical uses.

Ayahuasca and other psychedelic plants have been used for centuries across diverse settings for a wide range of spiritual and therapeutic purposes, and in recent years, the traditional uses of ayahuasca among Indigenous peoples in South America and Brazilian folk religions have expanded rapidly into mainstream global culture (Labate and Cavnar 2018; McKenna and Riba 2015; Sánchez and Bouso 2015; Tupper 2008). A renewed interest in ayahuasca and other psychedelic-assisted therapies has reemerged among health researchers, receiving mounting and far-reaching attention for potentially powerful therapeutic benefits through the induction of altered states of consciousness (Mithoefer et al. 2016; Pollan 2015; Sessa 2012), including improving problematic substance use (Bogenschutz et al. 2015; Johnson et al. 2014; Krebs and Johansen 2012; Thomas et al. 2013), addressing trauma (Mithoefer et al. 2016), recovering from eating disorders (Lafrance et al. 2017), and promoting psychological well-being (Gasser et al. 2015; Griffiths et al. 2016; Hendricks et al. 2015; Osório et al. 2015; Ross et al. 2016).

Specifically, ceremonial and ritualistic use of ayahuasca has been associated with reductions in various substance use problems (Fábregas et al. 2010; Grob et al. 1996), and a recent open-label trial in Brazil demonstrated rapid and sustained antidepressant effects following a single dose of ayahuasca administered to individuals suffering from treatment-resistant depression (Sanches et al. 2016).

The primary psychoactive constituent in ayahuasca is dimethyltryptamine (DMT), which is an agonist for sigma-1 receptors and 5-HT_{2A} serotonin receptors in the human brain (Fontanilla et al. 2009; McKenna and Riba 2015). Similar to other classical psychedelic substances (e.g., lysergic acid diethylamide (LSD), psilocybin, and mescaline), ayahuasca is believed to influence a group of interconnected brain regions known as the default mode network (DMN), which plays a key role in mediating cognitive states, such as daydreaming and mind-wandering (Carhart-Harris et al. 2014; Palhano-Fontes et al. 2015). The DMN has attracted considerable attention among cognitive neuroscientists, whereby neuroimaging research postulates that the DMN may be the physical counterpart to the psychological construct of the ego (Carhart-Harris et al. 2012; Carhart-Harris et al. 2014). The potential and tendency of ayahuasca to generate profound spiritual or "mystical-type" experiences, in which meaning, spirituality, connectedness, and recognition of the sacredness of life are enhanced and validated (Griffiths et al. 2006; Nour et al. 2017; Watts et al. 2017), may have utility in interventions to reduce problematic substance use (Garcia-Romeu et al. 2014).

Generating the Research

This research project developed after Gabor Maté, a Canadian physician specialized in addictions medicine with extensive experience working with Indigenous people, began using ayahuasca as an adjunct to group therapy in 2009. In partnership with a Peruvian Shipibo ayahuasquero and three of his Canadian apprentices, Maté's "Working with Addiction and Stress" retreats were being conducted to address various psychological health conditions, when a rural Coast Salish First Nations band learned of and became interested in the work being done with ayahuasca. After approval from the Band Council and Elders, the band invited the retreat team to hold the retreats in the community and offered our research group the opportunity to conduct an observational study to document and assess the impacts and outcomes of the retreats. Subsequently, two retreats were conducted in 2011, one in June and one in September.

The retreats employed multiple healing modalities, including group and individual counseling and two ayahuasca ceremonies. The retreat team facilitated group talk therapy sessions over a period of 4 days to elicit personal insights about historical experiences of trauma and related emotional or psychological issues, including problematic substance use and addictions. The ayahuasca ceremonies were presided over by a Shipibo master ayahuasquero alongside three (non-Indigenous) Canadian apprentice ayahuasqueros.

The research team obtained funding for the observational study through philanthropic donations to the Multidisciplinary Association of Psychedelic Studies (MAPS), the River Styx Foundation, and through an anonymous donor. Ethics approval was provided by the Institutional Review Board Services (IRBS), an independent research ethics review board in Ontario, Canada.

Description of the Study

The band's health office notified the community of the ayahuasca retreats and recruited potentially eligible participants. A total of 18 participants from the Coast Salish band were recruited for the two retreats. Eligibility criteria included being age 18 or older and having the ability to communicate in English. Participants were excluded if they had drunk ayahuasca in the past, were taking selective serotonin reuptake inhibitors or monoamine oxidase inhibitor medications, or were currently experiencing psychosis or had experienced a psychotic break in the recent past.

Initial self-administered surveys were conducted by the research team to collect baseline data on a number of psychological and behavioral factors related to problematic substance use. The specific psychometric instruments used in this study included the following: the *Difficulty in Emotion Regulation Scale* (DERS), the

Philadelphia Mindfulness Scale (PHLMS), the *Empowerment Scale* (ES), the *Hope Scale* (HS), the *McGill Quality of Life* survey (MQL), and the *4 Week Substance Use Scale* (4WSUS). Scale scores were calculated for the following measures: *mindfulness, empowerment, emotional regulation, hopefulness,* and *quality of life* (which included five subscales: overall quality of life, physical symptoms, psychological symptoms, outlook, and meaning). The instruments were selected based on a holistic interpretation of the biopsychosocial-spiritual model of human behavior, trauma, and substance dependence. More detail on the instruments, explicit rationales for their inclusion, and statistical analyses can be found in a previously published paper (Thomas et al. 2013).

Follow-up data collection was conducted in a group setting at the band's health office at 2 weeks and 4 weeks after the retreats and monthly thereafter for 6 months. For those unable to attend in-person follow-ups, sessions were conducted by telephone, and occasionally the instruments were completed by the participant on their own time and returned to the research team. A $20 gift certificate to a grocery store was offered to participants at each follow-up session, and meals were provided at in-person sessions.

At the request of several study participants to share their experiences in their own words, the research team added a short semi-structured interview as part of the final (6-month) follow-up session of the study to collect qualitative data and provide context around participants' experiences and impressions during and after the retreats. The interviews were conducted either in person or over the phone and were audio recorded and transcribed. Thematic analysis was performed to identify key themes (Argento et al. 2019). The questions included in the semi-structured interviews were as follows:

1. Did the addiction and stress retreat (including the two ayahuasca ceremonies) have any impact on your life? If "yes" to question 1, please answer questions 2 and 3.
2. On a scale of 1–10, with 1 being extremely negative and 10 being extremely positive, how would you rank the impact of the addiction and stress retreat on your life?
3. Please describe the impact that the addiction and stress retreat (and ayahuasca ceremonies) had on your life, for example, your substance use, personal relationships, sense of self, and your connection with nature and/or spirit.

Quantitative Analysis of Therapeutic Effects

Of the total 18 retreat participants, quantitative analyses were conducted for 12 participants who attended at least one retreat and had no missing data. Results demonstrated statistically significant improvements ($p < 0.05$) over time for measures relating to *mindfulness, empowerment, hopefulness,* and two *quality of life* measures: meaning and outlook (Table 10.1). Among participants who completed the final 6-month follow-up ($n = 11$), data suggest that fewer participants used alcohol,

Table 10.1 Repeated measures ANOVA for psychometric scales

Scale	F score	P value	N	Cronbach's alpha
Hope	3.14	0.023	12	0.456
Empowerment*	5.07	0.002	10	0.702
Mindfulness*	2.76	0.041	11	0.408
Emotional regulation*[a]	1.96	0.124	9	0.929
Quality of life—overall*	2.05	0.105	11	n/a
Quality of life—psychological*	2.52	0.055	12	0.736
Quality of life—meaning*	4.36	0.005	12	0.879
Quality of life—outlook*	4.43	0.004	12	0.925

*Sphericity is assumed as Mauchly's W is >0.05 for all measures
[a]Lower scores equal greater emotional regulation

Table 10.2 Proportion of participants who reported substance use at baseline compared with final follow-up (n = 11)

Substance	Proportion that used at baseline (%)	Proportion that used at final follow-up (%)
Tobacco	81.8	63.6
Alcohol[a]	50	20
Cannabis	45.5	45.5
Cocaine[a]	60	0
Amphetamines	0	0
Inhalants	0	0
Sedatives	18.2	18.2
Hallucinogens	0	9.1
Opioids	9.1	9.1

[a]N = 10; 1 participant did not answer the question at one phase

tobacco, and cocaine in the 4 weeks preceding the final follow-up than in the 4 weeks preceding the retreats at baseline (Table 10.2).

Figure 10.1 displays changes in the 4-Week Substance Use Scale (4WSUS) scores, measuring changes in participants' levels and patterns of use, cravings, and substance use-related harm for the substances used by at least 40% of the participants at baseline: tobacco, alcohol, cannabis, and cocaine. All 4WSUS scores decreased except for cannabis. Statistically significant reductions were demonstrated for problematic cocaine use over the study period (Thomas et al. 2013).

Perspectives on Healing and Recovery from Addiction

Qualitative interviews were conducted with 11 of the 12 participants who participated in the retreats and quantitative study. Participants included six men and five women with a mean age of 38 (ranging from 19 to 56 years of age). The primary objective of the semi-structured interviews was to elicit participants' perspectives

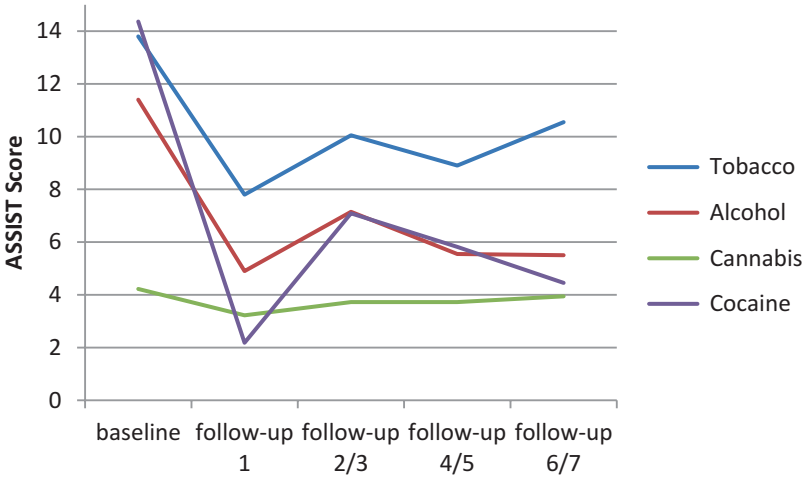

Fig. 10.1 Changes in 4WSUS scores for tobacco, alcohol, cannabis, and cocaine

and deeper understanding of their experiences with the ayahuasca retreats. In addition to eliciting responses around changes in substance use and addiction, the interviews explored how the retreats influenced participants' sense of connectedness with self, spirit and nature, and personal relationships with others (family, friends, and community). The qualitative findings expanded upon the prior quantitative analysis to provide a deeper understanding of the emotional, physical, psychological, spiritual, and interpersonal contexts around ayahuasca-based therapy for addiction (Argento et al. 2019).

Reductions in Substance Use and Addiction All participants described the retreats as having a positive impact on their substance use, coinciding with significant life improvements and healthier relationships with themselves and others. The retreats resulted in considerable reductions in substance use and the desire to use drugs and, for some, complete abstinence from alcohol and other drug use. Some participants explained that ayahuasca-based therapy helped them to better understand the underlying pain or trauma behind their substance use (e.g., losing loved ones), allowing them to address the causes of their addiction:

> Before the ceremony I was struggling with my addiction, crack cocaine, for many years. When I went to this retreat, it more or less helped me release the hurt and pain that I was carrying around and trying to bury…with drugs and alcohol. Ever since this retreat I've been clean and sober. So, it had a major impact on my life in a positive way. It affected my life in giving me another chance at life. (P4, 41-year-old woman)

> It [the retreats] put my substance [use] in my face and I just faced the problems that I was having that was keeping me in my abuse, and it… mostly had to do with my grief and loss of my twin brother and my… infant daughter that passed away. I just kept living it over and over again until I finally faced it and I just feel that there was closure. I don't use any more. I don't use anything. I don't smoke or anything. (P8, 34-year-old man)

The impact of the retreats on reducing substance use and cravings was a powerful theme to emerge from the narratives. Some participants reported a complete absence of cravings following the retreats, alongside a visceral, physical rejection by their bodies of any substance that was previously being used problematically, including tobacco, alcohol, pharmaceutical painkillers, and cocaine:

> When I left ayahuasca… I bought a pack of smokes, and I pretty much vomited… It was literally like my body would not absorb the nicotine… So that was really amazing… because I had this old habit of going to nicotine when overwhelmed with stress…. So, it helped me… be with all of the emotions and…not need a substance…helped me eliminate an old behavior… it's quite the journey. Whew [laughter]. (P3, 22-year-old woman)

> I'm off all my painkillers. I was on 50 mg of Fentanyl patches, I was on…oxycodone, you name it, I was on it. But I'm off everything…I believe that…my ayahuasca experience, won't let me put any more drugs in my body… It's rejecting it. Because it's making me physically ill… I was drinking, I was drugging, I was cracking out, I was IV drug using. I was a hard-core drug addict. And now I'm just down to maybe one or two medicinal marijuana joints a day. I'm off everything. (P1, 49-year-old woman)

> No cravings whatsoever for the crack cocaine or drinking. It's pretty strong, that ayahuasca, as far as removing that craving, that desire, that habit, or however you want to describe it. For me, it's not even there. (P7, 56-year-old man)

The narratives indicated that the retreats allowed some participants to reflect upon their addiction and elicited conscious contemplation of their substance use, leading to more acceptance of the nature of their addiction and a better ability to cope:

> It [the retreat experience] definitely makes me think more. Like, I am, like, I have cravings… I think I have more of a logical approach to it instead of just getting frustrated with myself… You know, I can say yeah, okay, I'm having a craving… I'm able to deal with it, cope with it easier… I definitely feel stronger. (P11, 30-year-old man)

> Overall, participants reported that the retreats had an overwhelmingly positive impact on reducing problematic substance use and addiction. The narratives portrayed considerable shifts in the ways participants perceived and experienced their substance use, and participants attributed these changes to the insights they gained into the reasons behind their addiction following the retreats. All participants noted that the retreats led to a reduction or, in some instances, a complete elimination of substance use. One participant explained: "I felt free of my addiction, that's for sure… I stopped completely. I had no desire to use" (P5, 19-year-old woman).

Comparison of Ayahuasca-Based Therapy with Other Treatment Approaches Participants reported that the retreats were more effective in treating addiction than their other treatment experiences. Some explained that other forms of therapy were often unsuccessful in addressing the underlying emotional issues related to their addiction. The narratives indicated that the success of the retreats was largely attributed to the ways in which ayahuasca-based therapy addressed unresolved trauma and emotional issues. Many of the participants' accounts provided greater insights into how and why the retreats and ayahuasca ceremonies were so successful at diminishing addiction and cravings:

> I'm on methadone and that did not work… and after that [retreat] I had no desire… I don't know what it is about that, but it really, it is very life changing. (P5, 19-year-old woman)

> This treatment is better, man. I know it is. Maybe half a dozen people that have gone to treatment over and over and over again… are now [following the retreats] …finally clean. (P6, 32-year-old man)

> I went to other treatments and I thought I dealt with it and it kept coming back to me. This [retreat] got into my mind and into me better. I felt I got more out of it and it was… a short period of time. It's exactly what I needed… things have changed now. I feel a lot better… healthier. My mind's more clear. (P8, 34-year-old man)

> Other treatments sort of like scraped the surface, as they say. This one got me… deep, deep into myself which I've never… confronted, I guess you could say, in the other treatments. This was just a mind-bending experience, boy (laughter). I can't believe what I seen and who I talked to, like, my mom and my dad and my granddaughter who are in the next world there [i.e., deceased]. And it was really, really touched me deeply and I think about that every day. So, there you go. (P9, 55-year-old man)

The narratives elucidated that the retreats cultivated an environment, whereby participants could access parts of the psyche that had been inaccessible to them with other treatment approaches, facilitating a healing of the foundational emotional issues underlying addiction:

> It was a whole new experience for me. I don't think I could compare it to anything else… this one was like… just going inside yourself and, like, in a different way… it was way more spiritual than any other treatment because the plant [ayahuasca] intensified it. (P2, 28-year-old woman)

Enhanced Connectedness with Self, Spirit, and Nature One of the most profound and consistent themes to emerge from the narratives was an enhanced sense of connectedness with self, spirit, and nature following the retreats, which was described as a key element associated with reduced substance use and cravings. The narratives suggested that participating in the ayahuasca retreats facilitated a connection to a "higher self" and provided meaningful insights into the psyche or emotional and psychological states related to addiction:

> Ayahuasca connected me to my higher self in a way… phenomenal changes, it's indescribable. It's just profound, big changes and big strides in areas of my life. Being free from myself… holding myself hostage through my addiction. (P7, 56-year-old man)

> The impact was huge on my spiritual and my emotional side. I opened up hugely in the emotional department… I feel stronger… my last experience with ayahuasca, I really faced myself. Like, my fear, my anger. Which, really, I think is a big part of my addictions. (P11, 30-year-old man)

Some participants indicated that the retreat experiences altered negative thought patterns to help gain important insights into psychological barriers to healing, such as relieving feelings of grief and facilitating self-acceptance and self-love. Others described feeling an emotional opening or release of repressed emotions after drinking ayahuasca:

> It relieved… a lot of negative thoughts within my body. Thoughts of what my life was like. It… opened my eyes to see where my stress and conflict is coming from… It's hard to explain but… it just brought a lot of grief up that I had inside me; it brought it out and I got rid of a lot of grief. (P9, 55-year-old man)

> It really opened my eyes…taking ayahuasca… It brought me back to my childhood and what I didn't like growing up, alcohol at home and abuse of home… and it finally opened my eyes to a realization of what I was doing to myself and my daughter. (P4, 41-year-old woman)

> It's actually helping me to do my psychological work… it made me look at myself and see how I react to the world, and how I can shift in the way that I actually, truly desire which is, you know, unconditional love. That's where I want to go. And so, ayahuasca has helped me, the whole retreat, to eliminate those barriers so I can… keep on healing and go forward and accomplish what I want to. (P3, 22-year-old woman)

> I felt like, just like a whole new reborn person. And yeah, I was really happy. I hadn't felt that happy in a long, long time. I felt way better about myself (P5, 19-year-old woman)

Ayahuasca-based therapy was also described as helping some participants to achieve more balance in life, gain a deeper understanding of the importance of stillness and mindfulness, and harness courage to confront emotions with acceptance and patience in the process of healing:

> It gave me the courage to go deeper… I found out why I didn't feel worthy, or didn't feel good enough to do anything… before I ever did ayahuasca, I had absolutely no balance in my life… I'm not on stimulants anymore… I always get up at five in the morning… because it's the only time that it's quiet in my house. I go in my lazy boy and just stare at my wolves… or I just sit there and meditate. (P1, 49-year-old woman)

> I realize that I deserve a better life and I love myself… After the retreat I felt like a brick that was lifted off of my shoulders and just feeling free. (P4, 41-year-old woman)

Participants further reported that the retreat experiences elicited a profound sense of spirituality and appreciation for the natural world. One participant reported that the impact of the retreat was "spiritually huge" (P11, 30-year-old man). Most participants described a heightened awareness of beauty in nature and a deeper sense of connection and gratitude:

> About a week or two after [the retreat] I was just waking up every morning at like five, six and going outside… to have a big connection with nature and just the trees moving, I just sat and stared at the trees and the wind for, like, 2 h. I would sit outside and it was just beautiful. I've never noticed it that much, ever, in my life. And, after I had the ayahuasca, it was just amazing, the connection with nature. (P5, 19-year-old woman)

> I had no sense of spirituality before, really, coming clean and sober even while I was going through, like, AA and NA. They tell you to reach your higher power or whatever. I thought that was a bunch of bull. But, after the retreats, I've really opened up to spirituality big time. I smudge every night before bed. I pray… I say thanks to whatever is out there, you know? (P11, 30-year-old man)

While some participants expressed having a well-established sense of spirituality prior to the retreats, narratives suggest that the connectedness to spirit and nature was intensified or renewed after participating in ayahuasca-based therapy:

> I just feel that definitely it [ayahuasca] got me more in touch with my spirit… I already was in touch with it. It just seems like it's more intensified, where everything is, like, has meaning and there is a way of life…Well, it seemed like it brought it out more 'cause it was there. But now it's there even more. (P2, 28-year-old woman)

> I've always been connected to nature and spirit bathing [a traditional Coast Salish spiritual ritual], but, upon ayahuasca, it's a far greater connection… to all living things. It's grounding, like feeling cleansed and purified. Grounded to Mother Earth. (P7, 56-year-old man)

Transformations in Personal Relationships Many participants reported that the retreats had a positive impact upon their personal relationships and that subsequent communication with close friends and family became easier and more constructive. For one participant, the retreats facilitated feelings of joy and happiness in reconnecting with his family, allowing him to spend time with his grandchildren again. He also reported that his friends could see a change in him and noted that he was "glowing" (P10, 51-year-old man). A common theme to emerge from the interviews was that the retreats facilitated more open and less judgmental interactions between participants and their friends and family, fostering more feelings of love for others:

> Since doing the ceremonies… I've grown hugely in that I can accept more. I'm more open to caring for other people… I think I have more love and respect for the people in my life. You know, more gratitude. (P11, 30-year-old man)

> It helped me see that they [friends] are actually trying and to eliminate judgment and have only love for them. So, it's helped me in a lot of ways to love, to love people on so many levels. (P3, 22-year-old woman)

> There have been a lot of changes, but all for the positive. There was a little rough spell there for a while, but, after the ayahuasca ceremonies, it allowed me to address things that were holding me back and upon my experiences that I had, showed me a way, a healthier way of [being] in my relationships… opened up where I felt I had a door closed to allow… my close family members inside. (P7, 56-year-old man)

One participant described how the retreats cultivated new friendships with other study participants and helped to build mutual trust and understanding for the challenges faced by people in the community. It was reported that the opportunity to share stories with other study participants made it easier to be nonjudgmental and enhanced a sense of community:

> As for relationships with the participants… we've become friends and it's really nice to actually have friends in the community. In First Nations communities, the norm is, usually, we are all separated. The retreat brought in different people and I've been able to connect with them and it's really nice… I got a sense of where the community is at and… I got to hear their stories. They shared their past and I was like, okay, they are the way they are because of multiple reasons. (P3, 22-year-old woman)

Overall Reflections on the Retreat Experiences The narratives demonstrated that participants' overall experiences with the retreats were predominantly positive and transformative. Participants were asked if the retreats had any impact on their lives and to rank the experience on a scale of 1 (extremely negative) to 10 (extremely

positive). The mean ranking was 7.95, and most participants (n = 8) gave their experience a ranking of 8 or higher (range = 5–10).

Overall, the narratives demonstrated a great appreciation for the entire retreat experience and admiration for all who guided the participants through the healing and recovery process, including the spirit of ayahuasca itself, the shamans, and the physician who facilitated the retreats:

> I admire the shamans… they were given the gift by the Creator, and to see people wanting to help First Nations individuals who live in addiction… to have this group really open-minded and willing to come to the community and help, that was an honor. As for the doctor… I admire him… it was just amazing to see the patience… and determination… his being… so intelligent and understanding human behavior, past history, present, future… oh man… I'm floored… I'm really shy… so to be able to interact with people and feel comfortable around them… was really nice… It's just real. (P3, 22-year-old woman)

> I felt honored and proud… I feel like I'm a success through the program, right? (P1, 49-year-old woman)

> I wish I was introduced to it [ayahuasca], like, 20 years ago. It could have saved me a lot of time and trouble. (P11, 30-year-old man)

Participants conveyed deep gratitude for the retreat experiences and an enhanced appreciation for life, highlighting how ayahuasca-based therapy led to reduced substance use issues and benefited overall health and well-being. Participants reported that valuable tools and knowledge were gained from the retreats that could be applied to aspects of daily life:

> The ayahuasca retreat was overwhelmingly educational. Like, from the research, to the research committee, to the ayahuasca group, to the doctor, even to the participants. Like, everybody educated me in one way or another and I left with an immense amount of knowledge that I was able to attempt to apply to my daily life. (P3, 22-year-old woman)

> I'm just grateful that this has happened because it made me realize how much my life is to me now and how much my daughter's life is to me, my husband, so much better without the drugs and alcohol. (P4, 41-year-old woman)

> I just enjoyed it and I'm glad I went to it. I feel a lot better and grateful for what I have today. (P8, 34-year-old man)

One participant described the retreat as the "best experience I've had in my life" (P5, 19-year-old woman). Another participant described it as "the most awesome experience I've ever experienced in my life" (P1, 49-year-old woman). Some participants also expressed that they would like to see ayahuasca-based therapy become available to others who suffer from mental and substance use disorders and that the overall experience is one that they would highly recommend to others:

> I'm looking forward to having that experience again. It was probably the best experience I've had in my life. And I haven't had a very good life. I've lived a very shitty life around people in addiction in my family and everything… doing that, being around all the people and after the feeling, it was just amazing. I don't know what else to really say… that lifestyle is very hard to get out of. And, I didn't think it was possible. I've tried to do it on my own and I don't know what it was but it actually it worked. (P5, 19-year-old woman)

> I think it [ayahuasca] is a good medicine. Why? Because it can shift energy and help people clear up some things so they can continue on their journey… Because we are so unaware about if we are holding things in or not… We are almost naïve to the expansiveness of the Creator and all living creatures… So, I'm really happy that… they can shift energies of people and help them on their journey. I highly advise it to be used. It [ayahuasca]'s a nice steppingstone to another level. (P3, 22-year-old woman)

The narratives unveiled another emergent theme around intercultural aspects of ayahuasca-based therapy. Ayahuasca was described as an important plant medicine that has therapeutic utility across Indigenous communities. One participant explained:

> It's an Aboriginal plant and we are Aboriginal people. I pray every morning that they let it be practiced within our communities… there is nothing wrong with Aboriginal medicine bringing in to another Aboriginal community. (P1, 49-year-old woman)

Limitations

The study design was limited to a small convenience sample of those who self-identified as having an interest in participating in the ayahuasca retreats, introducing the potential for self-selection bias. It is not possible to make any claims about whether the observed positive effects of ayahuasca-based therapy may be generalizable to other Indigenous peoples in Canada or elsewhere in the world. The study was not designed to assess the relative effects of group therapy work, other ancillary potentially therapeutic elements (e.g., spirit baths, sweat lodges), the pharmacological action of the ayahuasca, or the psychodynamic context of the retreats combining these various elements and did not track whether participants were involved in other forms of treatment during the follow-up period. Given the complex pharmacology of ayahuasca and unknown chemical composition of the brew drunk during the ceremonies, it is not possible to know whether the outcomes were dependent upon varying amounts or relative concentrations of the psychoactive components ingested. Nevertheless, as the narratives suggest, the effects of the brew were characteristic of ayahuasca phenomenology and therefore do not suggest any concerns about its composition or potency. Given the small number of participants and that some participated in two retreats while others participated in only one retreat, no conclusion can be drawn from this study on the potential harms/benefits of additional treatments.

There are notable challenges to conducting research on the effects of ayahuasca, some of which are ubiquitous to the broader field of research on illicit substance use and some that are unique to the study of plant medicines and psychedelics more generally. Firstly, the stigmatization and legal restrictions around ayahuasca and other psychedelics have made it difficult to obtain funding and government approval for research. Substantial barriers to obtaining financial and sociopolitical support for this work have considerably hampered the progress of academic and scientific

efforts. Randomized clinical trials, which have become the gold standard, are somewhat at odds with investigating the therapeutic potential of ayahuasca and other psychedelic substances. With respect to the complex nature of ayahuasca's plant brews and mixtures, as well as the associated ceremony, the stringent controls on the set and setting inherent to clinical trials, which are designed to isolate the effects of the drug, result in poor generalizability to populations outside the study. Clinical trials are further challenged with respect to ensuring double blinding, although a recent trial in Brazil implemented a series of measures in a double-blind placebo-controlled study of ayahuasca (Palhano-Fontes et al. 2018). Further, given the high cost of running clinical trials, they are liable to falling short on therapeutic preparation and integration of the ayahuasca experience. As such, mixed methods and qualitative approaches are needed in the field of research on ayahuasca. The qualitative aspect of this research added near the end of the project at the urging of participants allowed for a deeper and more personal examination of the role of internal and external connectedness in the healing journey, a crucial factor that was missed in the initial conceptualizations of the project.

Specific to studying ancient plant medicines such as ayahuasca, researchers are faced with extra challenges posed by the traditional cultural and spiritual contexts from which these plant medicines have emerged (Fotiou 2016). Of note, the ayahuasca-based therapy retreat in the present study entailed introducing a geographically and culturally distinct plant spirit and ceremony into an Indigenous community. The potential impact of the intermingling of spirits and ceremonies had to be carefully considered by the Coast Salish First Nation's Band Council and Elders before they extended their approval for the retreats to take place in their community.

Another important issue inherent to research on traditional plant medicines involves the inclusion of Indigenous knowledge. While a more in-depth discussion is beyond the scope of this chapter, Indigenous cultures have been working with ayahuasca for thousands of years, and critical questions remain around cultural appropriation, ecological sustainability, and how to best integrate the deep well of Indigenous knowledge and experience within research and treatment approaches (Labate and Cavnar 2018).

As with other research on substance use among marginalized populations, community-based and trauma-informed approaches are critical to addressing the needs faced by these populations (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014). In the case of working with Indigenous communities, an aspect of primary importance in conducting our research was that it was guided by the principles of ownership, control, access, and possession (OCAP®), developed by the National Steering Committee of the First Nations Regional Health Survey (Schnarch 2004). Research by Indigenous scholars has further highlighted culture-based approaches and decolonizing methodologies as necessary to understanding Indigenous peoples' research experiences and ensuring benefit to their communities (Goodman et al. 2017).

Final Thoughts

Findings from this study illuminate the emotional, physical, psychological, spiritual, and interpersonal contexts around ayahuasca-based therapy for treating addiction and addressing other substance use-related outcomes, with a central theme describing enhanced connectedness with sense of self, spirit and nature, and improved personal relationships. The results from this study corroborate and expand upon findings from previous studies and a growing body of research describing the therapeutic potential of ayahuasca and other psychedelics. As evidenced in this study, ayahuasca-based therapy has the potential to significantly alter one's relationship with self, spirit, and the natural world in ways that can facilitate healing and recovery from addiction. Experiencing enhanced connectedness was characterized in the narratives as a key element of the psychosocial processes associated with reducing substance use and addiction issues. A recent qualitative analysis further highlights the importance of transitioning from disconnection to enhanced connectedness in benefiting patients in the context of psilocybin-assisted therapy for treatment-resistant depression (Watts et al. 2017). Findings are also aligned with the well-developed literature on the protective effects of meaningful connection with others, as extensively documented in the youth prevention literature (Centres for Disease Control and Prevention 2009; Sieving et al. 2017).

The potential and tendency of psychedelics to generate "mystical-type" experiences, whereby personal meaning and the sacredness of life is enhanced and validated (Griffiths et al. 2006), may play a key role in reducing problematic substance use, by introducing much-desired meaning and purpose into the lives of those suffering from addiction (Garcia-Romeu et al. 2014). Furthermore, a core belief among Indigenous people in Canada, and elsewhere, is that there exists an interconnectedness of all things (e.g., people, animals, the earth, nature) and that a holistic approach to healing and recovery from addiction is one that encompasses a renewal of spirituality, a recovery of awareness, and the therapeutic power of the natural world (Chansonneuve 2007). The foundation of recovery from addiction is comprised of overlapping and interdependent dimensions of the psyche and the spirit (Mustain and Helminiak 2015), which is reiterated within Indigenous belief systems, whereby strengthening connections with self, spirit, and nature, alongside self-actualization, helps to achieve balance and attain healing (Chansonneuve 2007). Supportive findings from research using neuroimaging suggest psychedelics may allow for vivid recollection of autobiographical memories and may alter neural pathways to shift cognitive biases (i.e., habits of thought) and facilitate the positive reprocessing and reconciliation of traumatic memories (Bogenschutz and Pommy 2012; Carhart-Harris et al. 2012).

Notably, most participants in the present study ranked their ayahuasca-based therapy experience very highly in terms of the impact it had on their lives, and the majority emphasized the significance of the spiritual component of the experience. Narratives communicated deep gratitude for ayahuasca-based therapy and reiterated that the emotional clarity, self-acceptance, and positive transformations that

occurred within participants, and in their relationships with others and the world around them, had not occurred with other forms of addictions treatment.

Overall, this study highlights the therapeutic potential of ayahuasca-based therapy to facilitate deep and sustained healing and recovery from addiction for members of an Indigenous community in Canada, including some who had experienced highly traumatic histories and several failed treatment attempts. Findings describe the ways in which ayahuasca delivered in a ritualized and therapeutic retreat setting led to significant reductions in problematic substance use and cravings, as well as important enhancements to how participants relate to themselves, nature and spirit, and key individuals in their social support networks. Given the heterogeneity of Indigenous populations and distinct vulnerabilities associated with living in rural and remote settings, this study encourages further mixed-methods research tailored to the needs of marginalized populations. Future research should explore how ayahuasca and other psychedelics affect connectedness and other factors that may improve well-being and facilitate recovery from addiction.

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