LGBTQ+ Ayahuasca Retreat Experience is Associated with Benefits to Mental Health, Quality of Life, and Spiritual Well-being: A Prospective, Naturalistic Study

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ABSTRACT

Sexual and gender minority (SGM) individuals experience disproportionately high rates of depression, anxiety, trauma, and discrimination, yet remain underrepresented in psychedelic research. This prospective, naturalistic study explored the impact of an ayahuasca retreat experience on mental health, quality of life, and spiritual well-being among SGM participants. Nineteen individuals attending a seven-day ayahuasca retreat completed assessments across six time points from two weeks pre-ceremony to three months post-ceremony. Findings revealed significant reductions in depression and anxiety scores, alongside increases in spiritual well-being and quality of life, particularly within the first month following the retreat. Participants consistently described the experience as highly meaningful and spiritually significant, with many identifying the ceremony as among the most meaningful of their lives. Benefits were further supported by reports of positive behavioral changes, including improved interpersonal relationships and reduced substance use. Adverse effects were minimal and transient. Importantly, this study addresses a historical gap in the literature and highlights the need to reconceptualize psychedelic spaces as inclusive and reparative for queer communities. Given the historical misuse of psychedelics in conversion therapy, these findings mark a critical step in reclaiming such practices for healing, empowerment, and identity affirmation. The results suggest that intentional, culturally responsive psychedelic experiences may offer a valuable therapeutic pathway for SGM individuals. Further research in larger, controlled trials is warranted to better understand these outcomes and support inclusive psychedelic science.

Keywords: ayahuasca, psychedelic, hallucinogen, queer, LGBT, LGBTQ+, LGBTQIA+

INTRODUCTION

Stress-related mental health conditions disproportionately impact sexual and gender minority (SGM) individuals. Population-based sampling methods encompassing SGM individuals have consistently demonstrated that sexual minorities are at least twice as likely as heterosexuals to experience major depressive disorder, anxiety disorders, and substance use disorders (King et al., 2008). Elevated rates of comorbidity among sexual minorities, relative to heterosexual individuals, may further suggest a more severe clinical presentation, increased treatment resistance, and a more chronic course of mental health disorders (Cochran et al., 2003). These disparities likely extend to gender minority individuals, though there remains a significant lack of population-based studies that adequately address mental health outcomes and contributing factors among individuals of diverse gender identities (White Hughto et al., 2015; Pachankis, 2018).

Ayahuasca, a natural plant-based psychoactive brew traditionally used in ceremonies throughout the Western Amazon basin (Schultes, 1979), has demonstrated potential therapeutic benefits for a variety of mental health conditions. Indeed, growing evidence suggests ayahuasca consumption may provide therapeutic relief in relation to treatment-resistant depression (Palhano-Fontes et al., 2019), trauma (Nielson and Megler, 2014), suicidality (Zeifman et al., 2019), and grief (González et al., 2017, 2020). Group-based ayahuasca retreat experiences are associated with significant and persistent improvements in mental health, well-being, and psychological functioning, including reductions in depression and anxiety (Lowe et al., 2024). Somatic effects of ayahuasca are often strongly associated with psychotherapeutic processes of healing (Shanon, 2002, 2014; Espinoza, 2014; Kaufman, 2015), and have been likened to intense psychotherapy (Naranjo, 1979). Specifically, ayahuasca is associated with improvements in well-being and quality of life (Barbosa et al., 2012), and qualitative reports indicate greater self-love and compassion after use of ayahuasca (Renelli, 2018).

Despite renewed interest in the therapeutic potential of ayahuasca and other psychedelics for treating mental health conditions that disproportionately affect SGM individuals, the potential influence of gender or sexual orientation on outcomes in psychedelic research has been largely overlooked (Tolbert,

2003). This gap is especially troubling given the ethically and scientifically problematic history in which psychedelics were once used as part of conversion therapy. In the early 20th century, many leading psychoanalytic thinkers in the United States framed homosexuality as a disorder that needed to be cured or eliminated (e.g., Bieber, 1962; Socarides, 1968). Following the publication of the American Psychological Association's (APA) first Diagnostic and Statistical Manual of Mental Disorders (DSM-I), homosexuality was classified as a "sexual deviation" alongside pedophilia, fetishism, and sexual sadism. The pathologization of homosexuality in the 1950s coincided with the increasingly important role played by psychedelics in the development of biological psychiatry (Sessa, 2016). Psychedelic therapies were conducted extensively through to the end of the 1960s, and early implementations of psychedelics by psychologists were employed within the context of conversion therapy, a practice aimed at altering the sexual orientation of individuals who identify as homosexual (Cavnar, 2014). SGM adolescents were involuntarily subjected to "shock therapies" involving psychedelics, where they were locked in psychiatric units and given extremely high doses, including up to 800 micrograms of Lysergic acid diethylamide (LSD) and 1,200 milligrams of mescaline (Dubus, 2022). Masters and Houston (1966), for example, reported work with 14 homosexual men undergoing psychedelic therapy and attributed enhancements such as a deepening of voice, increased vigor, improved posture, and a heightened sense of masculinity to the effects of LSD treatment. Similarly, Martin (1962) recommended LSD as a treatment for homosexuality and claimed that seven out of 12 gay men achieved heterosexual orientation after administration of LSD. In the 1960s, Stafford and Golightly (1967) suggested that psychedelic therapy frequently led to the resolution of homosexual concerns and individuals often attained a sense of peace with their sexual orientation or came to identify as heterosexual.

Influential figures, such as Richard Alpert, J. Ross MacLean, Gary Fischer, Harold A. Abramson, Athanassios Kafkalidis, Michael Blumenfeld, Lewis Glickman, Joyce Martin, Earle F. W. Baker, and Roland Lanter, advocated for and practiced psychedelic conversion therapy or promoted SGM rejecting practices, causing significant harm (Abramson, 1955; Belser and Keating, 2022; Blumenfeld and Glickman, 1967; Davidson, 2022; Dubus, 2022; Ens, 2022; Jones, 2023). Stanislav Grof, a renowned

psychiatrist considered one of the principal developers of transpersonal psychology, treated homosexual clients using LSD and posited that gay men's aversion to sexual interactions with women stemmed from the visualization of "vagina dentata" and castration fantasies (Grof, 2000; Grof, 2009). In fact, Grof described homosexuality as a “sexual deviation” (Grof, 2009), “sexual disturbance” (Grof, 2000), a “psychopathological syndrome” (Grof, 2009), a “sexual pathology” and an “emotional disorder” (Grof, 1988). Timothy Leary, another renowned research scientist in the field of psychedelics and an advocate for psychedelics, once stated in a 1966 interview that “LSD is a specific cure for homosexuality.” (Belser and Keating, 2022; Playboy, 1966).

While practices of conversion therapy grew increasingly controversial following the removal of homosexuality from the DSM in 1973 (Drescher and Zucker, 2006), conversion therapy remains prevalent. Furthermore, psychedelic leaders continue to perpetuate homophobic and transphobic philosophy and practices, including at leading ayahuasca centers (Hartman, 2019; Natoli, 2022). Since the reemergence of psychedelics research after more than two decades of dormancy, there have been few reports on the intersection between psychedelics and SGM individuals. While much of this literature has been retrospective and anecdotal, narratives from SGM communities regarding their psychedelic encounters often highlight the positive rather than negative impacts these substances can have outside of formal research settings or clinical environments (Cavnar, 2014). To date, however, little quantitative research has examined the potential of ayahuasca to treat the disproportionate rates of mental health conditions observed in SGM communities.

To address this gap in research, the current longitudinal online survey study was conducted to gather prospective data on ceremonial ayahuasca use in SGM individuals and to provide further insight into the patterns and outcomes surrounding that use. Specifically, the study aims were to: (1) prospectively assess self-reported changes in mental health, spiritual well-being, and quality of life from before to after ceremonial ayahuasca use; (2) characterize participant intentions as well as aspects of set and setting associated with ayahuasca use, and (3) characterize risks and challenging experiences during and after ceremonial use of ayahuasca.

METHODS

Study Design

This prospective, naturalistic survey study enrolled participants who identified as members of the LGBTQIA+ community. Participants included English-speaking adults aged 21 years or older planning to attend a group-based retreat and consume ayahuasca outside clinical research settings held at the Jungle Gayborhood retreat center in Costa Rica. Recruitment took place independently through the retreat center and the organizers were not affiliated with the study. All participants attended the same retreat where the ceremony took place over seven days, including two consecutive days of ayahuasca ingestion. The study design consisted of six sequential web-based surveys assessing variables such as demographics, lifestyle, mindset, and personality traits, as well as characteristics of the experience itself such as dosage, ingestion method, intention, and setting, that could influence long-term effects and outcomes. Longitudinal measures were assessed before and after the ayahuasca sessions and were administered through Qualtrics XM secure online platform. The study was approved by an Institutional Review Board at the Western Institutional Review Board Copernicus Group (WCG IRB; IRB Tracking ID: 20241590). Following an initial informed consent and demographics survey (Survey 1), participants completed 5 surveys with timing relative to the reference ayahuasca experience: 2 weeks before (Survey 2), same day prior to the ceremony (Survey 3), 1-3 days after (Survey 4), 2-4 weeks after (Survey 5), and 2-3 months after (Survey 6). Responses were collected beginning with the Informed Consent on June 8, 2024, and concluded with the 2-3 month longitudinal follow up on October 11, 2024.

Survey 1: Consent and demographic information

Participants were invited to participate in the study if they met the following criteria: (1) were at least 21 years old; (2) were able to read and write English fluently; (3) identify as a member of the LGBTQIA+ community; (4) were willing to complete baseline, pre-session, post-session, and follow-up surveys, and share an email address where they would receive reminders with links to survey assessments; (5) were willing to participate in an on-site interview which would be recorded and

transcribed; and (6) were planning to attend a group-based ayahuasca retreat experience held at The Jungle Gayborhood in Costa Rica. Participants reviewed a waiver of documentation of informed consent explaining the study procedures, confirmed inclusion criteria, and provided basic demographic information including age, gender, race/ethnicity, education, and mental health history. Participants also recorded the purpose and intended date of the planned ayahuasca experience. An email address was provided where subsequent surveys and reminders would be sent.

Survey 2: Baseline 2 weeks Pre-ceremony

A series of assessments were administered longitudinally in this survey, at baseline, and again in the 2-4 week follow-up and 2-3 month follow-up surveys. Primary outcomes measures were used to assess mental health outcomes, quality of life, sleep quality, and spiritual well-being. Measures included a modified 20-item Beck Depression Inventory II (BDI-II) to assess depressed mood (excluding an item about current suicidality due to lack of ability to respond adequately to potential imminent risk) (Beck et al., 1996); the validated 20-item Short State-Trait Anxiety Inventory (STAI) assessing state (current) and trait (general) anxiety (Bergua et al., 2016; Spielberger et al., 1983); the 5-item World Health Organization Quality of Life-BREF (WHOQOL-BREF), which used as a general measure of quality of life (QoL; The World Health Organization, 1998); and the single-item Sleep Quality Scale (SQS), which was used to sleep quality assessment tool (Snyder et al., 2018). Additionally, the 12-item Functional Assessment of Chronic Illness Therapy Spiritual Well-Being (FACIT-Sp) was included to assess spiritual well-being dimensions of faith, meaning, and peace (Peterman et al., 2002).

Survey 3: Same Day Prior to Ceremony

Participants were asked about their planned dosage, intent of the session, emotional outlook regarding the session, as well as physical indications such as current ailments, diet, sleep quality, and substance use. Participants were also asked to assess their trust in the facilitator.

Survey 4: 1 to 3 Days After Ceremony

Survey 4 was completed 1-3 days after the second, and final, ayahuasca ceremony. Participants were asked to indicate how many doses they took on each day of the ceremony, as well as the timing of the initial dose and subsequent doses (in hours). Participants were also asked to indicate additional substance intake, if any. Participants were asked to rate how important aspects of the ceremony were in shaping their experiences, including the facilitator or guide, community or group, setting, safety, music etc. Several open-ended questions also assessed subjective experiences including brief narratives of their experiences, if they encountered challenging experiences, and any insights they gained. In addition, participants completed measures of the subjective qualities of the psychedelic experience.

Surveys 5 and 6: Follow-ups at 2-4 Weeks and 2-3 Months Post-ceremony

In surveys 5 and 6, completed approximately 2-4 weeks and 2-3 months after the ayahuasca ceremony, respectively, participants were asked to rate the meaningfulness, insightfulness, and spiritual significance of the experience. Items asked: "How personally meaningful/ psychologically insightful/ spiritually significant was your ayahuasca experience and your contemplation of that experience?" Responses ranged across eight options from "No more than routine, everyday experiences" to "The single most meaningful/ insightful/ spiritually significant experience of my life." Otherwise, all longitudinal measures (i.e., BDI-II, STAI, WHOQOL-BREF, SQS, FACIT-Sp) were re-administered in these surveys.

Additional Survey Data

Quantitative data was collected on various additional health outcomes. Participants also took part in a structured on-site interview where qualitative data was recorded and transcribed. This data will be published in subsequent accompanying manuscripts.

Data Analysis

Descriptive statistics, including means, standard deviations (*SD*) and ranges, were performed for

demographic variables. For longitudinal measures, analysis of variance (ANOVA) was used to identify differences across time points. Comparisons for longitudinal outcomes (i.e., BDI-II, STAI, WHOQOL-BREF, SQS, FACIT-Sp) were performed using *a priori* paired samples t-tests. All statistical analyses were performed using JASP (Version 0.19.3) statistical software for each variable pair across time (baseline versus 2-4 weeks; baseline versus 2-3 months; 2-4 weeks versus 2-3 months). Effect sizes were reported using eta squared (**η^2**) and 95% confidence intervals.

RESULTS

Participant Demographics

Nineteen participants provided informed consent for the study (Survey 1). Participants completed all follow-up studies (Survey 2 at 2 weeks pre-session; Survey 3 on the same day prior to the session; Survey 4 at 1-3 days post-session; Survey 5 at 2-4 weeks post-session; and Survey 6 at 2-3 months post-session). Mean age (*SD*) was 40.1 years (8.8). Participants were assigned as male (n = 14) and female (n = 5) at birth and currently identified as cisgender male (n = 11), cisgender female (n = 2), transgender male (n = 1), non-binary (n = 4), or a combination of male and non-binary (n = 1). Participants identified as homosexual (n = 11), bisexual (n = 3), or “fluid” / “queer” (n = 3). Participants reported being Caucasian/White (n = 10), Latino/Latinx (n = 2), Mixed Race (n = 3), Asian (n = 1), Arab, Middle Eastern, or North African (n = 1), African American / Black (n = 1), or Other (n = 1). Most participants reported residing in the United States (n = 11), held a bachelor’s level or higher degree (n = 17), and classified themselves as religious (n = 15).

Intention

During Informed Consent (Survey 1), participants characterized the purpose for the ayahuasca ceremony as (non-exclusively) self-exploration (n = 18), mental health (n = 14), therapy (n = 9), physical health (n = 6), creativity (n = 6), productivity (n = 5), recreation (n = 3), or other (n = 2; e.g., “Healing my inner wounds”). Participants reported their primary purpose as self-exploration (n = 10), mental health (n

= 4), creativity (n = 1), therapy (n = 1), productivity (n = 1), or other (n = 2). On the day of the first ceremony (Survey 3), all respondents (N = 19) reported setting a specific intention for the experience. For example, “I have set the intention to connect with the male lineage of my ancestry, uncover the root causes of some of my spiritual and mental blockages (comparison, inaction, apprehension), and to give my inner child some love and comfort.”, and “Letting go of the fear of not being good enough and coming into my own authentic self.” On the day of the ceremony, prior to the ceremony, participants were asked to share specific intentions in as much detail as possible in a free-text, open ended survey response. These results are summarized in **Table 1.**

Prior Use of Psychoactive Substances

Most participants (n = 13) reported previous use of a classic psychedelic substance (e.g., psilocybin mushrooms, psilocybin, LSD, ayahuasca, mescaline, etc.) that produced moderate to strong psychoactive effects, including psilocybin (n = 13), LSD (n = 8), ayahuasca (n = 6), mescaline, Peyote, or San Pedro (n = 4), and pure Dimethyltryptamine (DMT; n = 3). When asked about ayahuasca use in their community, most participants (n = 14) reported being a part of a community familiar with ayahuasca use (“I know a number of people who have used ayahuasca”; “I have many close friends who have used ayahuasca”; “I belong to a community that uses ayahuasca regularly”).

Health and Substance Use History

Some participants (n = 9) had been previously diagnosed or struggled with a mental health condition, physical health condition, or substance use condition, including anxiety disorder (n = 7), mood disorder (n = 6), chronic pain disorder (n = 3), ADHD (n = 1), and substance-related disorder (n = 1). Current and regular use of substances (more than once a month) included caffeine (n = 15), alcohol (n = 10), cannabis (n = 12), poppers (n = 6), ketamine (n = 4), tobacco/nicotine (n = 4), stimulants (i.e., amphetamine, methamphetamine, methylphenidate, etc.; n = 2), hallucinogens (n = 2), GHB/GBL/1,4-BDO (n =1), or other (e.g., 2CB, “psilocybin microdose”; n = 2).

Set: Preparation, Physical Indications and Outlook Prior to the Ceremony

Participants attended an ayahuasca ceremony as part of a seven-day retreat with a two-day lead-up time to the ceremony including optional practices such as a group discussion, journaling, nature walk, meditation, sound bath, and movement. On the day of the ceremony, prior to the ceremony (Survey 3), participants reported an average sleeping time of 7.0 hours (± 1.0) the previous night. Participants were asked to refrain from consuming solid food and reported an average fasting time of 5 hours prior to beginning the ceremony. Participants were also asked to remain hydrated, consuming an average of 5 cups of water since waking. All participants refrained from alcohol use and most participants refrained from consuming sugar (n = 15) or caffeine (n = 13) in the previous 24 hours. The results of an 8-item Likert scale questionnaire which assessed emotional state prior to the ceremony ranging from Strongly Disagree (1) to Strongly Agree (5) can be seen in **Table 2**. When participants were asked to (non-exclusively) select all emotional states that apply based on the question, "Right now, my current emotional state is…" participants indicated Excitement (n = 14), Calmness (n = 13), Interest (n = 12), Satisfaction (n = 7), Joy (n = 6), Awe (n = 5), Anxiety (n = 5), Relief (n = 3), Awkwardness (n = 3), Sexual Desire (n = 3), Aesthetic Appreciation (n = 2), Empathic Pain (n = 2), Entrancement (n = 2), Sadness (N = 1), Adoration (n = 1) Romance (n = 1), and Craving (N = 1).

Setting: Location and Facilitator Trust

The ceremony took place at the Jungle Gayborhood retreat center in Costa Rica, within a group-based hybrid indoor/outdoor space. The ceremony began at approximately 7:00 PM each night, and darkness was used as a sensory limiting tool. Prior to the ceremony (Survey 3), an 8-item Likert scale questionnaire (mean ± standard deviation) which assessed guide/facilitator trust ranging from Strongly Disagree (1) to Strongly Agree (5) included: trust in their qualifications (4.2 ± 1.1); trust in their safety and presence (4.5 ± 1.0); fear of nervousness in their presence (2.1 ± 1.1); and fear around their qualifications (1.5 ± 0.6). Four ceremonial guides/facilitators led the ceremony (two female, two male).

The lead guide/facilitator had 28 years of experience and study of facilitation and plant medicine work, with a focus on traditional and contemporary music practices. Additionally, two 'ceremonial guardians' attended each ceremony (one male and one female). In the post-session survey completed 1 to 3 days post-ceremony (Survey 4), participants reported live instrumentals, curated live vocals, curated soundtrack, performance music, non-curated background music, shamanic or ritualistic music, and nature sounds during the ceremony. In a Likert scale rating how important the ceremony and guide were in shaping their experience, most of the participants reported that the guide/facilitator (n = 17) and ceremony (n = 18) had a significant positive impact. Participants were asked to describe the impact of the guide/facilitator in their own words, and responses included, "The guide was wholly able to enable our own individual journeys, while cultivating a common thread for the group that emphasized the natural relationship with nature, with our community, and with the medicine.", "The facilitator was an anchor and a trusted source of information about the medicine, the ceremony and the journey.", and "They were enablers, guiding our self to unlock and see through all our walls."

Dosing

Ayahuasca was administered in the form of a brew. Traditional ayahuasca is variable in appearance, taste, and effects, with considerable variations in alkaloid profiles of ayahuasca from different sources (Callaway et al., 1999). A compound analysis was not performed and no standard dose was administered. Instead, participants reported the number of doses they received and the approximate ingestion time of each dose. Nearly all participants (n = 18) reported taking more than one dose on Day 1 of the ceremony (mean doses = 2.2 ± 0.4). Most participants (n = 15) reported taking more than one dose on Day 2 of the ceremony (mean doses = 2.5 ± 0.5). The average time in hours between the initial dose and second dose was 2.3 ± 0.5 hours on Day 1 and 2.3 ± 0.6 hours on Day 2.

Self-reported Outcomes in Symptoms of Depression

A modified 20-item Beck Depression Inventory II (BDI-II) was used to assess depressed mood

(excluding an item about current suicidality due to lack of ability to respond adequately to potential imminent risk) (Beck et al., 1996). In Survey 2 (2-4 weeks Pre-Session), participants reported average modified BDI-II mean (SD) scores of 10.2 (8.9). For Surveys 5 (2-4 weeks post-session) and 6 (2-3 months post-session), modified BDI-II mean (SD) total scores were 2.6 (2.5) and 4.6 (4.7), respectively. A summary of these results can be seen in **Figure 1**. A repeated-measures ANOVA comparing BDI-II total scores across time (2-4 weeks pre-session; 2-4 weeks post-session; 2-3 months post-session) revealed a significant main effect, $F(2, 36) = 10.89$, $p < .001$, with a large effect size ($\eta^2 = 0.38$). *A priori* paired-sample t-tests revealed a significant reduction in BDI-II scores from 2-4 weeks pre-session to 2-4 weeks post-session ($t = 4.40$, $p < 0.001$), a significant reduction in BDI-II scores from 2-4 weeks pre-session to 2-3 months post-session ($t = 2.64$, $p = 0.017$), and no difference between BDI-II scores from 2-4 weeks post-session to 2-3 months post-session ($t = -1.95$, $p = 0.067$).

Self-reported Outcomes in Symptoms of Anxiety

The validated 20-item Short State-Trait Anxiety Inventory (STAI) was used to assess state (current) and trait (general) anxiety (Bergua et al., 2016; Spielberger et al., 1970). In Survey 2 (2-4 weeks Pre-Session), participants reported average STAI state mean (SD) scores of 35.1 (11.2). For Surveys 5 (2-4 weeks post-session) and 6 (2-3 months post-session), STAI state mean (SD) total scores were 26.3 (6.6) and 32.5 (9.7), respectively. A summary of these results can be seen in **Figure 2**. A repeated-measures ANOVA comparing STAI state total scores across time (2-4 weeks pre-session; 2-4 weeks post-session; 2-3 months post-session) revealed a significant main effect, $F(2, 36) = 6.61$, $p = 0.004$, with a large effect size ($\eta^2 = 0.27$). *A priori* paired-sample t-tests revealed a significant reduction in STAI state scores from 2-4 weeks pre-session to 2-4 weeks post-session ($t = 4.25$, $p < 0.001$); however, there was no significant reduction in STAI state scores from 2-4 weeks pre-session to 2-3 months post-session ($t = 0.91$, $p = 0.377$), and a significant increase from STAI state scores from 2-4 weeks post-session to 2-3 months post-session ($t = -2.52$, $p = .024$).

In Survey 2 (2-4 weeks Pre-Session), participants reported average STAI trait mean (*SD*) scores

of 40.1 (12.1). For Surveys 5 (2-4 weeks post-session) and 6 (2-3 months post-session), STAI trait mean (*SD*) total scores were 32.4 (7.6) and 35.1 (9.8), respectively. A summary of these results can be seen in **Figure 2**. A repeated-measures ANOVA comparing STAI trait total scores across time (2-4 weeks pre-session; 2-4 weeks post-session; 2-3 months post-session) revealed a significant main effect, $F(2, 36) = 7.11$, $p = .003$, with a large effect size ($\eta^2 = .28$). *A priori* paired-sample t-tests revealed a significant reduction in STAI trait scores from 2-4 weeks pre-session to 2-4 weeks post-session ($t = 3.21$, $p = .005$), a significant reduction in STAI trait scores from 2-4 weeks pre-session to 2-3 months post-session ($t = 2.29$, $p = 0.035$) , and no change from 2-4 weeks post-session to 2-3 months post-session ($t = -1.75$, $p = 0.097$).

Self-reported Outcomes in Quality of Life

The 5-item World Health Organization Quality of Life-BREF (WHOQOL-BREF) was used as a general measure of quality of life (QoL; The World Health Organization, 1998). In Survey 2 (2-4 weeks pre-session), participants reported average QoL mean (*SD*) scores of 64.4 (19.5). For Surveys 5 (2-4 weeks post-session) and 6 (2-3 months post-session), QoL mean (*SD*) total scores were 77.3 (11.3) and 68.8 (18.1), respectively. A summary of these results can be seen in **Figure 3**. A repeated-measures ANOVA comparing QoL scores across time (2-4 weeks pre-session; 2-4 weeks post-session; 2-3 months post-session) revealed a significant main effect, $F(2, 36) = 4.33$, $p = 0.021$, with a large effect size ($\eta^2 = 0.19$). *A priori* paired-sample t-tests revealed a significant increase in QoL scores from 2-4 weeks pre-session to 2-4 weeks post-session ($t = -3.20$, $p = 0.005$) followed by a significant decrease in QoL scores from 2-4 weeks post-session to 2-3 months post-session ($t = 2.69$, $p = 0.015$). No significant changes in QoL scores from 2-4 weeks pre-session to 2-3 months post-session ($t = -0.77$, $p = 0.452$) were found.

Self-reported Outcomes in Sleep Quality

The single-item Sleep Quality Scale (SQS), which is used as a sleep quality assessment tool (Snyder et al., 2018), did not reveal changes in sleep quality from 2-4 weeks pre-session (6.6 ± 2.0) to 2-4

weeks post-session (7.1 ± 2.0) or from 2-4 weeks pre-session to 2-3 months post-session (6.7 ± 2.1) using two-way paired sample t-tests (ps < 0.05).

Self-reported Outcomes in Spiritual Well-being

The 12-item Functional Assessment of Chronic Illness Therapy Spiritual Well-Being (FACIT-Sp) was used to assess spiritual well-being dimensions of Faith, Peace, and Meaning (Peterman et al., 2002). Participants reported an average total score of 32.2 (10.3), 38.4 (7.0), and 37.5 (8.7) for Survey 2 (2-4 weeks pre-session), Survey 5 (2-4 weeks post-session), and Survey 6 (2-3 months post-session), respectively. For the Meaning & Peace subscale participants reported an average total score of 22.2 (6.5), 27.4 (3.8), and 26.0 (5.9) for Survey 2 (2-4 weeks pre-session), Survey 5 (2-4 weeks post-session), and Survey 6 (2-3 months post-session), respectively. For the Faith subscale participants reported an average total score of 10.0 (4.3), 11.0 (4.4), and 11.5 (4.1) for Survey 2 (2-4 weeks pre-session), Survey 5 (2-4 weeks post-session), and Survey 6 (2-3 months post-session), respectively. A summary of these results can be seen in **Figure 4**. A repeated-measures ANOVA comparing FACIT-Sp total scores across time (2-4 weeks pre-session; 2-4 weeks post-session; 2-3 months post-session) found a significant main effect, $F(2, 36) = 5.41$, $p = 0.009$, with a large effect size $\eta^2 = 0.231$. *A priori* paired sample t-tests revealed a significant increase in scores from 2-4 weeks presession to 2-4 weeks post-session ($t = -3.08$, $p = 0.006$) and from 2-4 weeks presession to 2-3 months post-session ($t = -2.30$, $p = 0.033$). No changes were observed from 2-4 weeks post-session to 2-3 months post-session ($t = 0.51$, $p = 0.616$).

A repeated-measures ANOVA comparing Meaning & Peace FACIT-Sp subscale total scores across time (2-4 weeks pre-session; 2-4 weeks post-session; 2-3 months post-session) revealed a significant main effect, $F(2, 36) = 7.33$, $p = 0.002$, with a large effect size ($\eta^2 = 0.289$). *A priori* paired-sample t-tests revealed a significant increase in Meaning & Peace FACIT-Sp scores from 2-4 weeks pre-session to 2-4 weeks post-session ($t = -3.91$, $p = 0.001$) and from 2-4 weeks pre-session to 2-3 months post-session ($t = -2.42$, $p = 0.026$), but not from 2-4 weeks post-session to 2-3 months post-session ($t = 1.07$, $p = 0.301$).

A repeated-measures ANOVA comparing Faith FACIT-Sp subscale total scores across time (2-4 weeks pre-session; 2-4 weeks post-session; 2-3 months post-session) revealed no significant main effect, $F(2, 36) = 1.70$, $p = 0.197$, $\eta^2 = 0.086$.

Subjective Ratings of Experiences, Attributions and Personal Well-being

In Survey 4 (1-3 Days Post-session), on a 7-point Likert scale rating the overall experience ranging from "Extremely negative" to "Extremely positive", participants rated the experience as Extremely Positive (n = 15) or Moderately Positive (n = 4). No participants rated the experience as negative. In Survey 5 (2-4 weeks post-session), participants were asked to rate how personally meaningful, spiritually meaningful, psychologically challenging, and psychologically insightful their experience of ayahuasca was compared to other life experiences. Participants considered the experience to be among the top 10, top 5, or single most personally meaningful (n = 13), spiritually meaningful (n = 14), and psychologically insightful (n =13) experiences of their life. A minority of participants considered the experience among the top 10, top 5, or single most psychologically challenging (n = 5). In Survey 6 (3-4 months post-session), most participants still considered the ceremony to be among the top 10, top 5, or single most personally meaningful (n = 13), spiritually meaningful (n = 14), and psychologically insightful (n = 12) experiences of their lives. A minority (n = 5) reported that the ceremony was still among the top 10, top 5, or single most psychologically challenging experiences of their lives. Most participants (n = 18) reported that the experience and their contemplation of the experience led to positive long-term changes in their sense of personal well-being or life satisfaction. A summary of these findings can be seen in **Table 3**.

Subjective Reports of Behavioral Changes

When asked whether participants experienced any notable behavioral changes since their ayahuasca session, most participants reported notable behavioral changes at 2-4 weeks (n = 16) and 2-3 months (n = 18) after their ayahuasca experience, respectively (**Table 3**). The most commonly reported

behavioral changes were improved relationships with others (n = 12 at 2-4 weeks; n = 16 at 2-3 months), improvements in career / work life (n = 9 at 2-4 weeks; n = 8 at 2-3 months), reduced or stopped using other drugs (n = 5 at 2-4 weeks; n = 7 at 2-3 months), improved diet / nutrition (n = 5 at 2-4 weeks; n = 5 at 2-3 months), increased physical activity / exercise (n = 3 at 2-4 weeks; n = 6 at 2-3 months), and reduced craving or use of alcohol (n = 5 at 2-4 weeks; n = 2 at 2-3 months). At the 2-3 month follow-up, one participant reported that they started using other drugs more often / heavily.

Symptoms & Adverse Effects

In Survey 4 (1-3 days post-session), no participants reported seeking medical attention during the ayahuasca ceremony. Participants reported several adverse events during and within 24 hours after the ayahuasca ceremony. A summary of these results can be seen in **Table 4**. Some participants (n = 5) experienced physical pain during the ceremony, with a mean (SD) pain rating of 7.0 (2.4) on a scale out of 10, lasting a mean (SD) duration of 2.0 (1.7) hours. Descriptions of where pain sensation occurred included lower back / spine (n = 3), abdomen (stomach area) (n = 2), arm (n = 2), head / face / mouth (n = 2), chest area (n = 1), pelvis (n = 2), upper back (n = 1), hand (n = 1), neck (n = 1) and shoulder (n = 1). In Survey 5 (2-4 weeks post-session), respondents reported some persisting negative effects including nausea (n = 1), mood fluctuations (n = 1), loneliness (n = 1), and other (n =1) which was described as “Brief paranoia”. No participants reported persisting negative symptoms in Survey 6 (2-3 months post-session).

DISCUSSION

This prospective, naturalistic study assessed the mental health, quality of life, and spiritual well-being outcomes associated with a ceremonial ayahuasca retreat experience in a sample of individuals from sexual and gender minority (SGM) communities. Participants, all of whom self-identified as members of the LGBTQIA+ community, attended a seven-day ayahuasca retreat and were evaluated

across six time points, from 2-4 weeks pre-ceremony baseline through to three months post-ceremony. The results demonstrated statistically significant reductions in symptoms of depression and anxiety, as well as increases in quality of life and spiritual well-being. These effects were most pronounced within the first month following the retreat. Most notably, decreases in depression scores from baseline were sustained across time points, indicating continuous improvement in depression symptoms following ceremonial ayahuasca use. Participants also reported behavioral improvements, such as improvement in relationships with others in the 2-4 weeks (n = 12; 63.3%) and 2-3 months follow-up surveys (n = 16; 84.2%). These findings contribute important new evidence to the growing body of literature on psychedelic-assisted healing, with specific relevance to historically marginalized SGM populations who have often previously been pathologized in psychedelic research and clinical history.

Mental Health Outcomes

The study demonstrated substantial and sustained reductions in depressive symptoms following the ayahuasca retreat. Mean scores on the Beck Depression Inventory-II (BDI-II) decreased by over 70% from baseline to the 2–4-week follow-up and remained significantly lower at the 2–3-month mark (> 50% decrease). These findings are consistent with prior clinical research suggesting that ayahuasca has fast-acting and durable antidepressant effects (Palhano-Fontes et al., 2019; Lowe et al., 2024). Significant reductions in both State and Trait anxiety, assessed via the State-Trait Anxiety Inventory (STAI), were observed within the first month following ayahuasca ingestion. Though state anxiety symptoms declined from 2-4 weeks pre-session to 2-4 weeks post-session, scores increased significantly from 2-4 weeks post-session to 2-3 months post-session, indicating limitations to the potential sustained effect of ceremonial ayahuasca on state anxiety symptoms and a potential return to baseline for situation-based anxiety. Trait anxiety, in contrast, demonstrated a similar pattern of reduction from baseline to 2-4 weeks post-ceremony, but reductions in trait anxiety symptoms were sustained throughout the study period, indicating a more substantial lasting therapeutic effect for trait anxiety compared to state anxiety. This potential for rapid and sustained relief in mood and anxiety symptoms could be instrumental for SGM

populations, who experience disproportionately high rates of mood disorders, trauma, and suicidality (King et al., 2008; Cochran et al., 2003). Importantly, participants attributed these changes to the ayahuasca retreat experience and reported notable downstream behavioral changes, including improved interpersonal relationships and reduced substance use, reinforcing the therapeutic potential of the ceremonial context.

Spiritual Well-being Outcomes

Most participant (n = 15) classified themselves as religious or spiritual. Spiritual well-being, as measured by the adapted Functional Assessment of Chronic Illness Therapy-Spiritual Well-Being (FACIT-Sp) scale, was assessed across the two factors: Faith and Peace and Meaning. Significant increases were observed for FACIT-Sp total scores and Peace and Meaning subscale scores which were sustained across follow-up assessments, indicating that ceremonial ayahuasca allowed participants to experience stronger feelings of spiritual well-being and more peace and meaning in their lives. Spirituality, a personal experience of connection or transcendence beyond the self, is important in the lives of many individuals including those who identify as lesbian, gay, bisexual, transgender, and/or queer (Halkitis et al., 2009). Prior work suggests that intersecting religious/spiritual LGBTQ identities may synergistically contribute to personal and spiritual growth and development (Rosenkrantz et al., 2016), including promoting self-acceptance, formations of identity, and contributing to forgiveness of others for expressing prejudice. Stronger feelings of spiritual well-being following ayahuasca ingestion may have meaningful and impactful outcomes on general well-being and mental health and may be an important factor of consideration when determining the potential benefits of psychedelic-assisted healing.

Quality of Life Outcomes

General QoL, assessed using the WHOQOL-BREF, showed a statistically significant increase from baseline to 2–4 weeks. However, scores significantly decreased from 2-4 weeks to 2-3 months. This temporal pattern suggests that ayahuasca may catalyze a short-term boost in perceived life satisfaction

and functional well-being. A lack of a sustained effect in QoL may potentially be explained by various factors, including a lack of sustained community support, integration, or the return of individual daily stressors which occur outside of the retreat experience. However, assessments of perceived changes at follow-up surveys assessing psychological and behavioral changes highlighted persisting improvements in emotional resilience, interpersonal connection, and life/career purpose, among others. These perceived improvements are particularly meaningful in the context of SGM individuals, who often face barriers to well-being due to systemic discrimination, internalized stigma, and lack of access to culturally competent mental health care.

Adverse Effects

Although the overall risk profile of ayahuasca is low and it is considered relatively safe to use (dos Santos and Hallak, 2025) several participants did report acute adverse effects following ayahuasca ingestion. The most common in-session reactions included hallucinations (n = 11), nausea and vomiting (n = 7), and physical discomfort such as heart pounding/sweating (n = 7), blurred vision (n = 6), fatigue and drowsiness (n = 6), or physical pain (n = 5). These effects were largely transient, with only fatigue persisting within 24 hours after the session (n = 10). These experiences are consistent and expected with known somatic and psychological reactions to ayahuasca ingestion. At the 2-4 week follow-up, a small number of participants reported lingering symptoms including mood fluctuations (n = 1), loneliness (n = 1), and nausea (n = 1). By the 2–3-month follow-up, no persistent adverse effects were reported. These findings suggest that while acute discomfort may arise, especially in emotionally intense ceremonies, the risk of serious or lasting harm in a supportive setting appears minimal.

Reclaiming Psychedelics in Queer Healing Contexts

This study holds particular significance given the fraught historical relationship between psychedelics and SGM communities. During the mid-20th century, psychedelic compounds were regularly used in coercive attempts to “convert” homosexual individuals, often under the guise of medical

treatment (Dubus, 2022). Figures such as Grof and Leary openly promoted LSD as a "cure" for homosexuality, contributing to decades of pathologization and trauma (Grof 2000; Grof 2009; Playboy, 1966). The ethical failure of these practices has left a legacy of mistrust toward medicalized psychedelic frameworks among SGM individuals. By centering SGM voices and conducting this study in a culturally affirming, community-based setting, the current research represents advancement in the request for a paradigm shift to centering psychedelics around queerness rather than against it (Hartman, 2019). Rather than viewing psychedelics as tools for correction, this study presents them as a unique potential catalyst for self-acceptance, healing, and empowerment within SGM communities. Furthermore, the study's intentional design, which emphasized peer support, identity affirmation, and safe spaces, may serve as a model for future interventions that seek to ethically and effectively serve SGM communities. By documenting the therapeutic potential of psychedelics in this SGM group, the study also calls attention to the glaring modern underrepresentation of SGM individuals in current clinical psychedelic research and trials.

Study Limitations

The current study findings have several limitations and should be interpreted carefully. Due to the small sample size of the participant group and LGBTQIA+ specific population sample, findings for the present study should not be generalized to the wider population (but see Lowe et al., 2024). Because the data were gathered online and in different settings prior to and after the ceremony, it is not possible to verify participant responses and response bias among this sample may have influenced how participants chose to answer survey questions. Additionally, ayahuasca dosing was not standardized, and biochemical composition of the brew was not verified. Different doses and subjective responses in intensity could have influenced outcomes independently of the setting. Further clinical controlled trials are needed to verify the potential therapeutic effects of ceremonial ayahuasca for LGBTQIA+ populations and the general population.

Conclusion

To our knowledge, this study is the first in recent years to prospectively examine the psychological and spiritual effects of an ayahuasca retreat-experience in SGM populations. The findings suggest that participation in a ceremonial ayahuasca retreat may lead to meaningful and sustained reductions in depression and anxiety, stronger feelings of spiritual well-being, and positive behavioral changes. These outcomes were achieved without clinical oversight or standardized dosing, highlighting the therapeutic potential of non-clinical, community-based psychedelic experiences when conducted within safe, affirming environments. The broader implication of this work lies in its challenge to the historical misuse of psychedelics and its contribution to the development of a queer-centered psychedelic science. By amplifying SGM perspectives and experiences, this research not only fills a critical gap in literature but also sets a course for what psychedelic-induced healing can look like for LGBTQ+ populations. Future work must continue to prioritize inclusion, integration support, and ethical frameworks that honor the diverse ways in which healing manifests across identities. This study marks a vital step forward in building a truly inclusive psychedelic renaissance.

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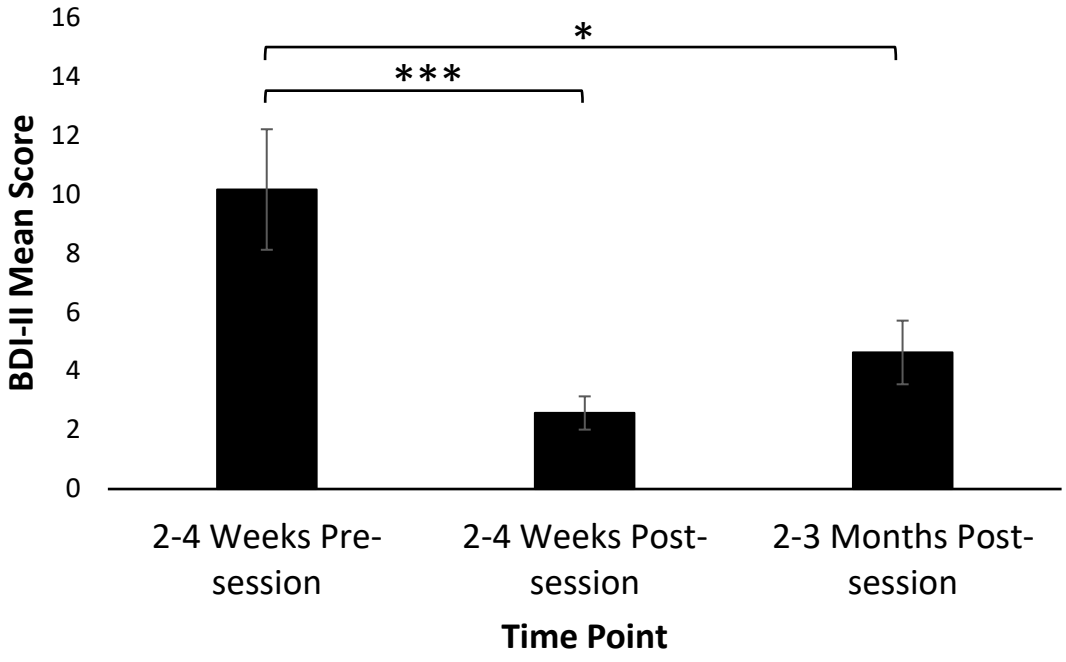

Figure 1. Longitudinal changes in Depression (BDI-II), from baseline (2-4 weeks pre-session) to 2-3 months post-session. * = < 0.05; ** < 0.01. *** < 0.001.

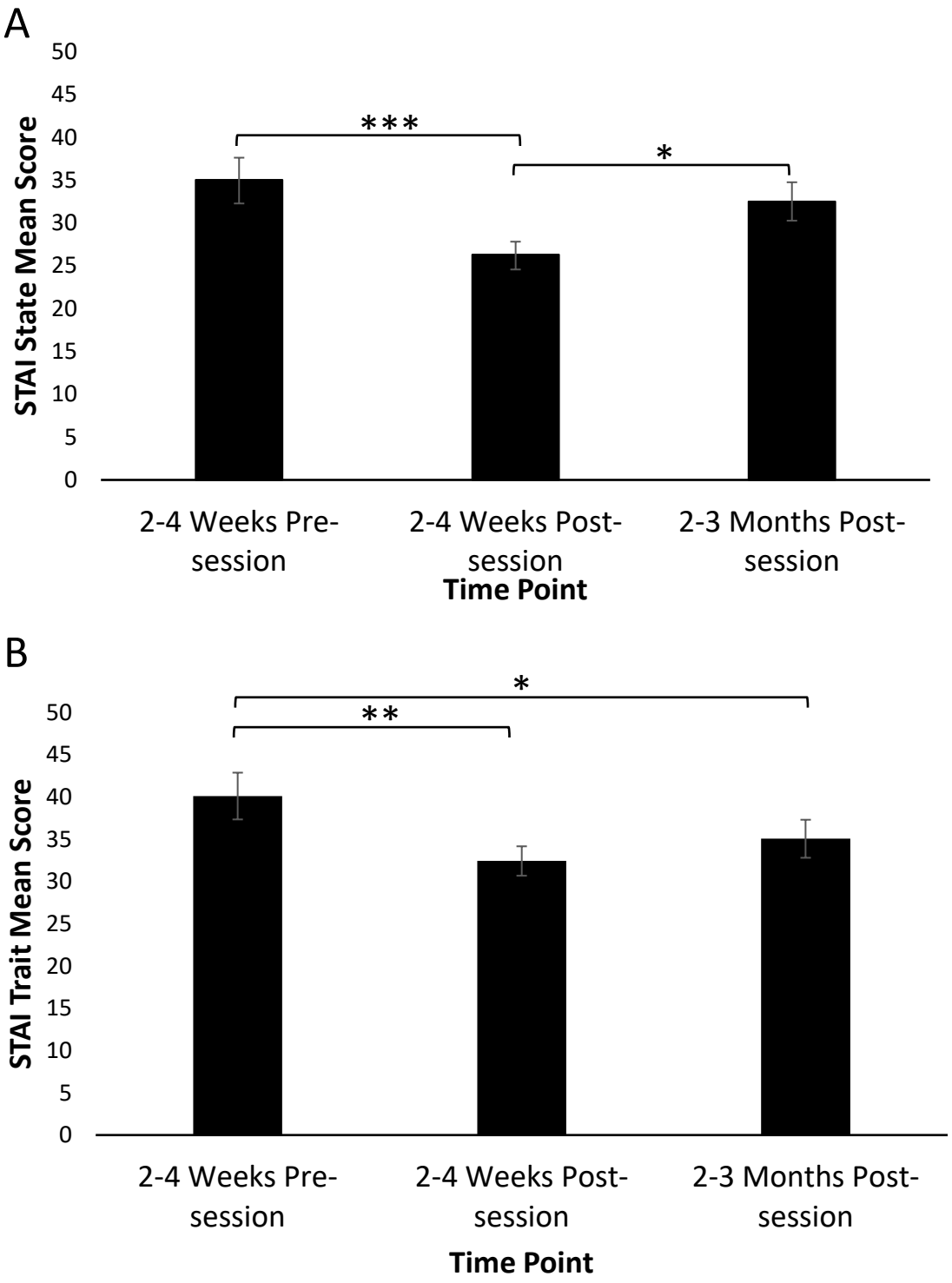

Figure 2. Longitudinal changes in (A) State (STAI-S) and (B) Trait (STAI-T) Anxiety from baseline (2-4 weeks pre-session) to 2-3 months post-session. * = < 0.05; ** < 0.01. *** < 0.001.

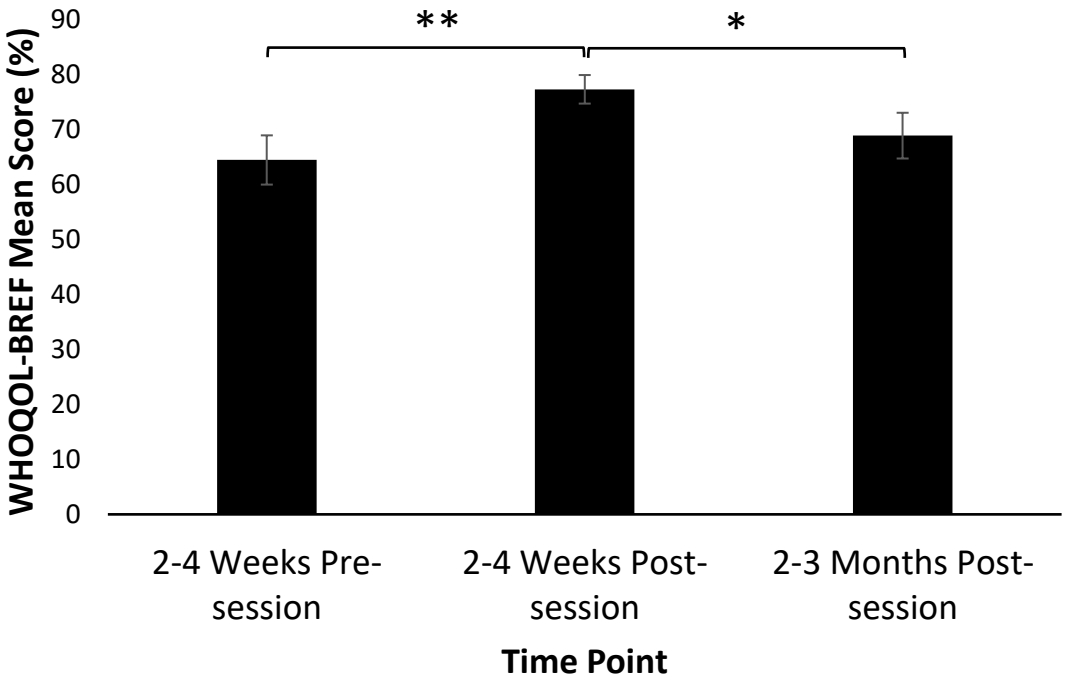

Figure 3. Longitudinal changes in quality of life (WHOQOL-BREF) from baseline (2-4 weeks pre-session) to 2-3 months post-session. * = < 0.05; ** < 0.01. *** < 0.001.

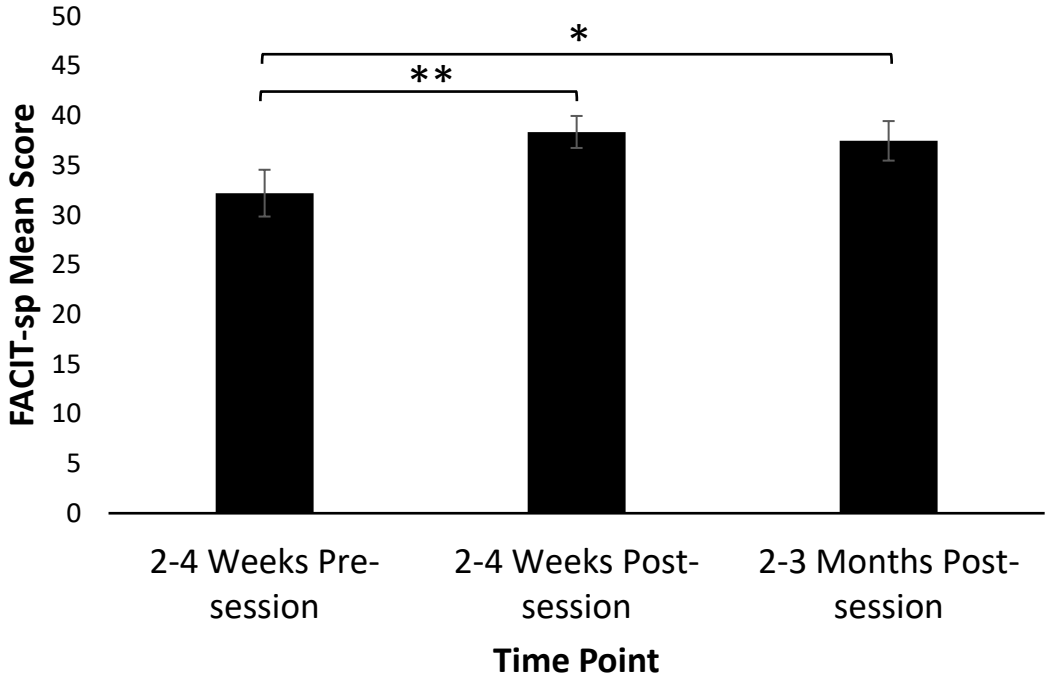

Figure 4. Longitudinal changes in spiritual well-being (FACITsp) total mean scores from baseline (2-4 weeks pre-session) to 2-3 months post-session. * = < 0.05; ** < 0.01. *** < 0.001.

Table 1. Participant Intentions

Participant	Intention
1	My intention is to go deeper within myself with the help of this sacred ayahuasca ceremony. I am hoping to identify the primary wound/trauma that I need to heal / let go / be aware in order to further understand my sense of self.
2	Physical Healing: Especially my lumbosacral plexus, releasing trauma. Subtle Energetics: Experience the interaction of plant medicine (Ayahuasca) with my subtle energies.
3	To elevate and evolve beyond the ways of the default world. To accept and love me to the point of ego death and killing fear (such as stage fright).
4	I'm going open minded and curious to discover what mother Aya has to show me. It's a moment of evolution for me, deciding next steps and looking for clarity on best way.
5	My intention is to understand myself and the roots of my persona. I aim to heal open wounds from my childhood, such as parental scars, social issues, anxiety, depression, and challenges with self-love.
6	I'm seeking spiritual guidance and open to what the medicine has to show me. A few things on my mind: I would like to feel more safe in queer spaces back home in [place]. I would like to feel more safe expressing myself creatively. I would like to invite sexual intimacy & relationships back into my life. I would like to feel part of a queer community again. I would like guidance on how to earn income in a way that feels aligned. Currently not working for the past two years and running low on finances.
7	Letting go of the fear of not being good enough and coming into my own authentic self.
8	To be open to this experience and really explore, investigate and accept whatever the medicine offers up to me the opportunity to see and heal with/from.
9	I intend to clear the debris of trauma past, including forgiving myself for my trauma responses, and my delay in addressing those behaviors against myself.
10	I set the intention to let go of attachments to things and people. And to have clarity of what I want next in life and why.
11	My intention is to surrender to crack my heart wide open.
12	Revealing and releasing the things that no longer serve me well. I want to experience ego death. I want to feel unconditional love so that I may continue to feel it and give it and attract it.
13	I have several intentions: - Heal my gut. I have been suffering from a burning sensation if I eat anything besides a very restrictive diet. Also, I wake up most days with this burning feeling in my stomach. - Clarity in my next step in life. Four years ago my life did a complete 180º when I quit my office job and moved to the jungle. Ever since I've been struggling with what my

	purpose in life is. I studied psychology but I haven't done anything with this knowledge. - Change my relationship with fear. I have been afraid to move in any significant direction for years now. I fear failure so I don't do anything. - Change my relationship with marihuana. To stop myself from feeling shame for not doing anything relevant, I have been smoking a lot of marihuana, which helps numb any feeling of guilt. I don't feel I need to quit altogether, but I do feel I need only to do it at the right moments.
14	The root of my intentions are to trust and surrender. I've been working through some themes/patterns and things I'm looking to change in therapy and I have faith that the medicine will show me what I need to see in order to move forward through these patterns/blocks and into the next phase of my life.
15	My intention is to release the trauma from my past romantic relationship, to forgive myself and find ways to love myself fully. My intention is to cultivate my spirituality and healing practice to help myself and others as a future spiritual healer. I seek clarity of a path forward in life.
16	Inward look to perhaps gain some insight and understanding about how to proceed with this next life chapter. Highly concerned regarding the political state of the [place], which makes me want to reconsider where I call home.
17	I have set the intention to connect with the male lineage of my ancestry, uncover the root causes of some of my spiritual and mental blockages (comparison, inaction, apprehension), and to give my inner child some love and comfort.
18	Loving all parts of myself. A clearer vision for my future.
19	Self acceptance of my autism and unmasking.

Table 2. Emotional outlook immediately prior to the ceremony.

Select the responses that best capture your current outlook regarding your upcoming ayahuasca session.[1]	**Response (SD)**
Excited	4.4 (0.7)
Enthusiastic	4.2 (0.8)
Open	4.7 (0.5)
Physically safe	4.6 (0.6)
Emotionally safe	4.4 (0.8)
Apprehensive	2.8 (1.2)
Nervous	3.2 (1.2)
Scared	2.4 (0.9)

[1] Ratings provided on the following 5-point scale: Strongly Disagree=1; Disagree=2; Neutral=3; Agree=4; Strong Agree=5.

Table 3. Retrospective ratings on ayahuasca experience and subsequent use (Surveys 5 and 6).

	2-4 weeks, mean (SD)	**3-4 months, mean (SD)**
How personally meaningful was your ayahuasca experience and your contemplation of that experience? [1]	5.6 (1.5)	5.7 (1.6)
How spiritually significant was your ayahuasca experience and your contemplation of that experience? [1]	5.8 (1.8)	5.7 (2.0)
How personally psychologically insightful was your ayahuasca experience and your contemplation of that experience? [1]	5.6 (1.7)	5.5 (1.7)
How psychologically challenging was the most psychologically challenging portion of the ayahuasca experience? [1]	3.9 (2.1)	4.6 (1.7)
Do you believe that the ayahuasca experience and your contemplation of that experience has led to long-term and persisting changes in your current sense of personal well-being or life satisfaction? [2]	1.7 (0.9)	1.5 (1.0)
Have you experienced any persisting negative effects from your ayahuasca experience, which lasted beyond the duration of the drug's effects? [2]	**2-4 weeks, n (%)**	**3-4 months, n (%)**
None	16 (84.2)	19 (100.0)
Mood fluctuations	1 (5.3)	0 (0.0)
Confusion	0 (0.0)	0 (0.0)
Loneliness	1 (5.3)	0 (0.0)
Lowered motivation	0 (0.0)	0 (0.0)
Depressive notions	0 (0.0)	0 (0.0)
Persisting hallucinations	0 (0.0)	0 (0.0)
Dizziness	0 (0.0)	0 (0.0)
Nausea	1 (5.3)	0 (0.0)
Physical pain (That didn't already exist)	0 (0.0)	0 (0.0)
Have you experienced any notable behavioral changes since this ayahuasca session?	**2-4 weeks, n (%)**	**3-4 months, n (%)**
Reduced or stopped using other drugs	5 (26.3)	7 (36.8)
Started using other drugs more often / heavily	0 (0.0)	1 (5.3)
Reduced craving or use of alcohol	5 (26.3)	2 (10.5)
Increased craving or use of alcohol	0 (0.0)	0 (0.0)
Improved diet / nutrition	5 (26.3)	5 (26.3)
Worsened diet / nutrition	0 (0.0)	0 (0.0)
Increased physical activity / exercise	3 (15.8)	6 (31.6)
Decreased physical activity / exercise	0 (0.0)	0 (0.0)
Improved relationships with others	12 (63.2)	16 (84.2)
Worsened relationships with others	0 (0.0)	0 (0.0)

Improvements in career / work life	9 (47.4)	8 (42.1)
Worsening of career / work life	0 (0.0)	0 (0.0)
Other (please describe)	6 (31.6)	3 (15.8)
None of these	3 (15.8)	1 (5.3)

[1] Ratings provided on the following 8-point scale: No more than routine, everyday personally meaningful / spiritually significant / psychologically insightful /challenging experiences =1; Similar to experiences that occur on average once or more a week=2; Similar to experiences that occur on average once a month=3; Similar to experiences that occur on average once a year=4; Similar to experiences that occur on average once every 5 years=5; Among the 10 most personally meaningful / spiritually significant / psychologically insightful /challenging experiences of my life=6; Among the 5 most personally meaningful / spiritually significant / psychologically insightful /challenging experiences of my life=7; The single most personally meaningful / spiritually significant / psychologically insightful /challenging experience of my life=8.

[2] Ratings provided on the following 7-point scale: Strong positive change that I consider desirable=1; Moderate positive change that I consider desirable=2; Slight positive change that I consider desirable=3; No change=4; Slight negative change that I consider undesirable=5; Moderate negative change that I consider undesirable=6; Strong negative change that I consider undesirable=7.

Table 4. Symptoms during (in-session) and after (< 24 hours post-session) ayahuasca (Survey 4)

Adverse Event	**In-session, n (%)**	**< 24 hours post-session. N (%)**
Physical pain (That didn't already exist)	5 (26.3)	1 (5.3)
Lack of appetite	3 (15.8)	0 (0.0)
Tremors	3 (15.8)	0 (0.0)
Nausea and/or vomiting	7 (36.8)	0 (0.0)
Tactile disturbances	4 (21.1)	0 (0.0)
Increased heart rate	4 (21.1)	0 (0.0)
Cramping	2 (10.5)	0 (0.0)
Headaches	4 (21.1)	1 (5.3)
Drowsiness	6 (31.6)	1 (5.3)
Depression or low mood	1 (5.3)	1 (5.3)
Confusion	3 (15.8)	0 (0.0)
Insomnia	1 (5.3)	2 (10.5)
Difficulty concentrating	3 (15.8)	2 (10.5)
Heart pounding, or sweating	7 (36.8)	0 (0.0)
Irritability	1 (5.3)	1 (5.3)
Restlessness	5 (26.3)	3 (15.8)
Hallucinations	10 (52.6	0 (0.0)
Blurred vision	6 (31.6)	0 (0.0)
Seizures	1 (5.3)	0 (0.0)
Anxiety	2 (10.5)	0 (0.0)
Fever	0 (0.0)	0 (0.0)
Fatigue	6 (31.6)	10 (52.6)
Other (please describe)	2 (10.5)	0 (0.0)
None of the above	1 (5.3)	8 (42.1)