The Effects of a Spiritually Integrated Trauma Healing Program on PTSD Symptoms and Spiritual Well-Being in Nigeria

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Abstract

Post-traumatic stress disorder (PTSD) has been identified as a significant concern worldwide, but very few spiritually oriented programs to address trauma have been tested in low- to middle-income countries. This study evaluated the effectiveness of a faith-based, community-centered program in reducing PTSD symptoms and enhancing spiritual well-being. The program is designed for the participants' well-being, while also equipping them to help their community in a form of task sharing. A total of 98 Nigerians participated in six five-day workshops, half in the capital city and half in areas farther north, where conflict was more common. The Posttraumatic Stress Disorder Checklist and the Spiritual Assessment Inventory, with subscales of *Awareness of God*, *Disappointment with God*, *Realistic Acceptance*, and *Instability*, were used as measures pre and post intervention, then nine-months later for a follow-up assessment. Immediate results showed significant reductions of PTSD symptoms, with a moderate effect on the whole group and a large effect on those who reached the cut-off for PTSD prior to the workshop. Improvement in relationship with God was also evident. A small proportion of the sample completed the nine-month follow-up, and demonstrated maintained improvement in PTSD symptoms, except for those who had experienced additional distressing events. While overall spiritual well-being remained stable, individuals experiencing distressing events reported increased disappointment with God. Findings demonstrated the efficacy of spiritually oriented interventions in bridging the treatment gap, using models of sustainability and task-sharing in low-income settings.

Keywords: trauma, spiritually-oriented intervention, program evaluation, Nigeria, PTSD, post-traumatic growth, task-sharing

Introduction

Post-Traumatic Stress Disorder (PTSD) is a significant global mental health concern, with prevalence rates varying across income levels and regions (Koenen et al., 2017). While some studies indicate a lower overall prevalence in low- to lower-middle-income countries (LMICs), Seedat and Suliman (2018) highlight the underreporting of PTSD due to cultural factors and limitations in assessment methodologies. The prevalence of PTSD tends to be higher in the context of interpersonal violence against women, which is more prevalent in these regions. Moreover, studies focusing on post-war countries reveal significantly higher prevalence rates of PTSD, with meta-analyses reporting rates between 23.81% and 26.51% (Hoppen & Morina, 2019; Hoppen et al., 2021). These findings underscore the profound impact of armed conflict on mental health, particularly in LMICs where the majority of survivors live.

The disparity in treatment provision is stark, with only 22.8% seeking treatment in LMICs, compared to 53.5% in HICs (Koenen et al., 2017), demonstrating the urgent need for effective interventions that are accessible and feasible within resource-constrained settings. Addressing PTSD in LMICs necessitates a multifaceted approach, including preventative measures, improved screening, and expanded access to treatment. In global mental health initiatives, task-sharing has become a key tool in bridging the gap between need for care and provision of care. Task sharing, or task shifting, in health care involves training non-specialist health workers or lay people to provide mental health services, addressing the shortage of specialized professionals and improving care access in low-resource settings (WHO, 2008). Task-sharing initiatives and community-based interventions offer promising avenues for delivering mental health treatment in LMICs (van Ginneken et al., 2013), including trauma-focused care in African countries (Woods-Jaeger et al. 2017). This study assesses the effectiveness of a program used in Nigeria to address the high rates of PTSD present, providing both personal interventions and training to prepare leaders for task-sharing. Participants were Nigerians affiliated with a church or organization, selected primarily because of their role as leaders or capacity to help others.

Trauma Interventions in Low- to Middle-Income Countries (LMIC)

Morina et al. (2017) conducted a meta-analysis of 18 studies completed in LMICs on the effectiveness of treatment for PTSD and depression for adults in high-conflict regions, including a wide range of interventions. Although a large effect size was evident in the pre-post measures, the effect size was smaller in comparison to control groups (Morina et al., 2017). Both trauma-focused and immediate-problem interventions yielded positive outcomes, warranting further research to identify effective strategies across contexts. Purgato et al. (2018) also conducted a meta-analysis of 36 studies of trauma treatment in LMICs during humanitarian crises. Immediate symptom reduction was significant, yet long-term effects waned compared to controls, highlighting the need for sustainable interventions.

Another meta-analysis evaluated interventions for depression and PTSD conducted by professionally-trained lay counselors in LMICs (Connolly et al., 2021). Various approaches

yielded mixed results, some producing effective outcomes, indicating the potential of task-sharing in underserved areas. As not all interventions were showed clinically significant outcomes, further research is needed to optimize intervention effectiveness, considering factors like optimal training, ongoing supervision, and cultural context. New interventions need to be replicated and tested for effectiveness in multiple contexts, as is done in this study.

Importance of Spirituality and Religion in Trauma Care

Religion and spirituality (R/S) have been acknowledged as relevant in reaction to potentially traumatic events, contributing toward increased resilience by serving as a buffer (Peres et al., 2007). In recovery from trauma R/S help to find meaning, prevent hopelessness, contribute to better quality of life (Currier et al., 2016; Park et al., 2017), and promote post-traumatic growth (Shaw et al., 2005). However, some beliefs are associated with negative outcomes (Conner et al., 2003), suggesting that not all forms of religiosity and spirituality are beneficial or equivalent, just as religious coping exist in both positive and negative forms (Pargament et al., 1998). A review of studies measuring the effect of religiosity on the psychological outcomes of trauma found some studies linked religiosity to fewer PTSD symptoms, while others suggested greater severity (Kucharska, 2020). In contrast, spiritual experiences and intrinsic religiosity were more consistently related to better outcomes in PTSD and post-traumatic growth (Kucharska, 2020).

Perception of God can play a significant role in how a relationship with him influences trauma recovery (McElroy-Heltzel et al., 2018). The view of a severe God has been linked to higher self-blame, while the concept of a benevolent God supported lower levels of self-blame in reaction to trauma (Kucharska, 2018). Research in the context of disaster trauma supported the view of God as an attachment figure, and validated security-enhancing connection with a benevolent God in the recovery process (Davis et al., 2019).

A traumatic event can also upset an existing perception of God. Herman (2022) described trauma's disruption of the foundational trust established in early childhood, in relation to both people and God, resulting in questioning God's goodness when allowing the trauma to occur. Restoration of trust with a benevolent God and resolution of the negative thoughts and emotions directed toward him and toward other people is essential in the healing process.

Spiritually Oriented PTSD Treatment

Harris et al. (2021) reviewed eight spiritually oriented programs for addressing spiritual distress in trauma contexts, assessed with randomized controlled trials. Some were explicitly spiritually oriented (e.g., Building Spiritual Strength), while others were implicit (e.g., Impact of Killing in War). The majority demonstrated positive results, with a wide range of effect size for the reduction of PTSD symptoms (Harris et al., 2021). Additionally, two online Christian meditative programs showed positive results for decreasing trauma-related symptoms (Knabb et al., 2022a; Knabb et al., 2022b). All of these studies were based in the US.

Two studies of spiritually oriented, trauma-focused interventions were conducted in low-income countries. Spiritually Oriented Trauma-Focused Cognitive-Behavioral Therapy (SO-FT-CBT) was used with children rescued from slavery in Haiti, showing a greater reduction in PTSD symptoms and spiritual struggles compared to controls (Wang et al., 2016). In Nicaragua, a pilot study of the faith-based Healing the Wounds of Trauma (HWT) program showed a significant reduction in PTSD symptoms post-intervention, with no significant change at six-month follow-up, and a non-significant trend in improved spiritual well-being (Schultz et al., 2016).

Overall, programs implementing spiritually oriented interventions show promising results in reduction of PTSD symptoms, as well as some improvement in spiritual well-being. However, empirical research in LMICs is still very limited. Like SO-FT-CBT and HWT, this study is testing the effectiveness of a spiritually oriented, trauma-focused program in a low-income country, with measures of PTSD symptoms and spiritual well-being. The current Tree of Life (ToL) program is more condensed and community-based than the treatment-oriented SO-FT-CBT program, while it includes more direct intervention than HWT; it includes a broader, more holistic approach than both of them. In addition, participating groups managed logistics and funding on a local level to set the foundation for sustainability, and a key feature was for participants to learn skills for future task-sharing.

The Program: The Tree of Life

The Tree of Life: Finding Healing and Growth in Jesus (ToL) is a five-day workshop designed to help participants address emotional, relational, and spiritual issues, and to equip them to help others in their community. While this study assesses the initial program, advanced training is also in place to prepare future facilitators. After supervised practice, they can implement the program in their own cultural context.

The ToL promotes a holistic view of thriving, not just surviving, through growth in spiritual well-being (relationship with God), improved relational skills, exploration of one's identity, and healing from traumatic memories (Hervey, 2019). There is an integration of psychoeducation about topics such as trauma and resilience, spiritual practices such as Lectio Divina, small group interaction, individual activities, and the primary intervention, the Immanuel Intervention (Hervey, 2023).The Immanuel Intervention is a faith-based intervention developed by Karl Lehman (2023), based on a broader goal of establishing a relationship with Jesus, known as the Immanuel Approach (IA), and used in clinical contexts for re-processing traumatic memories. It serves to reestablish intimacy with God, first in a secure, positive environment. With secure attachment in place, encountering him in a traumatic memory serves to change emotional and cognitive reactions, reprograming the brain, much like occurs in eye movement desensitization and reprocessing (EMDR). While there is an abundance of anecdotal evidence of its effectiveness, studies on the implementation of ToL were the first empirical measures of the efficacy of II in reducing symptoms of trauma and improving spiritual well-being (Bresser, 2022; Hervey, 2023). Over the course of the week, participants not only learn the approach and receive

the intervention, but also practice implementing it under close supervision, in order to equip them to use the skills through conducting the intervention in their community.

Previous Studies

Thus far, two empirical studies have been completed to evaluate the Tree of Life, with positive results that motivated broader research. A program evaluation conducted in Nigeria in 2020 included a total of 41 participants in three five-day workshops (Hervey, 2023). Pre and post evaluations demonstrated a significant reduction in PTSD symptoms ($p < .001$), as measured by the PTSD Checklist for DSM-5 (PCL-5). The effect size was moderate ($d = 0.508$) for the whole group and large for those who reached the cut-off for a likely diagnosis of PTSD (≥ 33) prior to the program ($d = 1.001$). Spiritual well-being was also measured using the Spiritual Assessment Inventory (SAI), and there was a significant improvement in Realistic Acceptance ($d = -0.404$), and some improvement in Awareness of God, but not statistically significant ($p = .078$). There was also a significant decrease in Instability with a small to moderate effect size ($d = 0.389$), as well as a decrease in Disappointment with God, but not statistically significant ($p = .059$).

A study of the effectiveness of the program was also conducted in Kenya, including 44 participants who had experienced at least one traumatic event (Bresser, 2022). The same measures were used and the outcomes were consistent with the study in Nigeria (Hervey, 2023), showing even greater effect sizes for the PCL-5 measure of PTSD symptoms, with a large effect ($d = 1.09$) for the whole group and an even greater effect ($d = 1.82$) for those who had a PTSD cut-off score ≥ 33 prior to participating in the program. Measures of spiritual well-being also showed significant improvement in Realistic Acceptance ($p = .011$, $d = -.41$), while the small improvement of Awareness of God was not statistically significant. In the negative subscales there were significant decreases with moderate effect sizes in both Instability ($d = .52$) and Disappointment with God ($d = .58$) (Bresser, 2022).

Current Study

The current study implemented the program with six groups in two states in Nigeria, co-led by a previously trained Nigerian and two Americans. The primary goal was to assess the program's impact on participant well-being, clinically and spiritually, in a larger Nigerian sample, aiming to validate previous findings. It was hypothesized that there would be a significant reduction in PTSD symptoms upon completion of the program, and that there would be some improvement in spiritual well-being. The second aim was to evaluate long-term outcomes, expecting sustained reductions in PTSD symptoms and retained improvements in spiritual well-being nine months post-intervention, using the same measures.

Method

The purpose of the study was to evaluate the effectiveness of the Tree of Life program among Nigerians with a larger, broader sample, including Abuja, the capital city, as well as two smaller cities in the Middle Belt, where violence and kidnapping were more common. Participants included pastors, seminary students, and laypeople, who could in the future implement the skills and knowledge learned, in order to reduce the existing mental health

treatment gap. Data were gathered from six groups completing the five-day workshop offered in partnership with local Nigerian churches and organizations. Effectiveness was measured based on PTSD symptoms and spiritual well being pre- and post-participation in the program, as well as nine months after completion of the program.

Procedure

The study proposal was reviewed and approved by the Bingham University Teaching Hospital Health Research Ethics Committee in Jos, Nigeria. Ethical considerations included the risks and benefits of participation, protection of confidentiality, and cultural considerations. There was no evidence of the program having detrimental effects on previous participants, although at times short-term emotional discomfort came with addressing traumatic memories. A significant benefit was finding resolution to such memories and subsequent decrease in PTSD symptoms. Additional beneficial outcomes include practical psychoeducation related to trauma, increased self-awareness of both strengths and needs, growth in relationship with God, improved relational skills, and development of resilience. Confidentiality was protected by omission of identifying information in the assessments. Cultural sensitivity was emphasized in the development and implementation of the program, the selection of participants by the local groups, and the role of a trained Nigerian as a program facilitator.

Participants were selected by a local organization based on their positions as volunteers on the "front lines" (i.e., areas with high levels of violence), from a church as the leaders in the church diocese, and by seminary leaders who identified students with the appropriate ministry focus. While the local context suggested a widespread exposure to trauma, there was no specific screening for a type of traumatic event exposure required for participation; the intervention was intended to address all painful memories and the intention of the program as a whole was for well-being on multiple levels for both participants and their communities, but only a limited number of measures can be included in a study. As in the previous studies, each group participated in the five-day program, which included a workbook, presentations, group discussions, spiritual activities, examples, and practical intervention experience, each taking turns being the recipient, the facilitator, and the observer in the Immanuel Intervention practice sessions. The program was conducted by three facilitators, including the current researcher, another trained American, and a Nigerian who had participated in earlier trainings and engaged in supervised facilitation.

Prior to beginning the program, participants were invited complete a questionnaire with basic demographic questions and Likert-type scale measures for PTSD symptoms (PTSD Checklist for DSM-5, PCL-5) and spiritual well-being (Spiritual Assessment Inventory, SAI). Each selected a three-digit number instead of writing any identifying information on the form. Upon completion of the program, participants completed the same questionnaires and open feedback questions. Nine months later they were asked to fill out the assessment online. Reminders were repeatedly sent out via email, WhatsApp, and text messages, but the response rate was unfortunately very low.

Sample

Of the original 113 participants, a total of 98 completed the program and submitted the pre- and post-tests at the time of participation. Fifteen completed the program, but did not provide both assessments and were thus omitted from data analysis. The average age was 47.13 years old, with a range from 23 to 68. Group sizes were similar, ranging from 13 to 19 participants each week. The majority of participants were men, 61.2%, compared to 38.8% women (see Table 1).

Table 1
Demographic Information

Variable	Frequency	Percent
Gender		
Female	38	38.8%
Male	60	61.2%
Total	98	100%
Age		
20-30	7	7.21%
31-40	22	22.68%
41-50	30	30.92%
51-60	25	25.77%
61-70	13	13.40%
Total	97	100%

Measures

The PTSD Checklist for DSM-5 (PCL-5) has 20 items based on the symptoms identified by the DSM-5 for the diagnosis of PTSD (Weathers et al., 2013).[1] This self-report tool uses a five-point Likert-type scale based on the severity of symptoms. Reliability was evident in the first program evaluation conducted in Nigeria (Hervey, 2023), with a reliability of $\alpha = .91$, similar to the current study's pre-test measure of $\alpha = .92$. The cutoff score for a probable diagnosis of PTSD is 31 to 33; this study took 33 as a conservative cutoff, but placed more emphasis on change in symptomatology than on a diagnosis. Weather et al. (2013) identified a clinically significant change to be 10 points to identify meaningful improvement.

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[1] After the release of DSM-5, the original versions for military and civilians were adapted and evaluated (Blevins et al., 2015), demonstrating both internal consistency (Study 1: $\alpha = .94$, Study 2: $\alpha = .95$) and test-retest reliability ($r = .82$). Rates of reliability were consistent in international studies done with translations into Bangla in Bangladesh ($\alpha = .90$) (Islam et al., 2022), Arabic and Kurdish in Iraq ($\alpha = .85$) (Ibrahim et al., 2018), and Shona in Zimbabwe ($\alpha = .92$) (Verhey et al., 2018).

The Spiritual Assessment Inventory (SAI) was used as a measure of spiritual development (Hall & Edwards, 2002).[2] It is centered on the individual's relationship with God, including *Awareness of God* (one subscale with 19 items), and the *Quality of Relationship with God*, which measures subscales of *Instability* (e.g., "I am afraid that God will give up on me"), *Grandiosity* (e.g., "God recognizes that I am more spiritual than most people"), *Disappointment with God* (e.g., "There are times when I feel frustrated with God"), and *Realistic Acceptance* (e.g., "When I feel [frustrated with God], I still desire to put effort into our relationship"). A final measure was *Impression Management*, which intended to assess the test-taking attitude and how the individual wants to be perceived. When evaluated using the item response theory (Hall et al., 2007) the coefficient alpha reliabilities for the subscales ranged from $\alpha = .82$ to $\alpha = .91$. The coefficient alpha for Impression Management was $\alpha = .77$ (Hall & Edwards, 2002).

In the current study, the sub-scales for the SAI were evaluated for reliability in the pre-intervention assessment and compared with the previous study (Hervey, 2023). The high reliability for Awareness of God appeared consistent with the original study ($\alpha = 0.899$, compared to $\alpha = .886$). The reliability was higher for Realistic Acceptance ($\alpha = .836$, compared to $\alpha = .711$) and Instability ($\alpha = .89$, compared to $\alpha = .718$). Like the previous study, the reliability scores were low for Grandiosity ($\alpha = .642$, compared to $\alpha = .668$) and Impression Management ($\alpha = .601$, compared to $\alpha = .618$); these scales were omitted from analysis.

Because of the timing, with groups participating between July and October of 2021, the impact of COVID-19 was taken into consideration. Pre-program questions included: 1) During the past year, have you experienced any individual traumatic events? If so, briefly describe what occurred. 2) During the past year, how strongly has COVID-19 influenced you? They were given a Likert-type scale of 0 (Not at all) to 4 (Very Strongly), followed by the open question: If it has impacted you, briefly describe how.

In order to get a clearer understanding of the impact of the Immanuel Intervention, upon completion of the program, participants were asked: "Did you have an encounter with Jesus? If you did, how did it influence you?" A qualitative analysis was conducted by coding key phrases and concepts, identifying recurring themes, and quantifying the prevalence of each theme. Additional feedback questions (e.g. what was most helpful, what was least helpful) were included for assessment and improvement of the program. Finally, in the nine-month follow-up interview they were asked: "Have there been any traumatic events in your life since the Tree of Life Training? If so, briefly name them."

Results

The perceived impact of COVID-19 was explored as participants were asked how strongly it influenced them, with 42.4% responding "Not at all" or "Mildly," 25% responding

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[2] SAI was originally published by Hall and Edwards (1996), followed by exploratory and confirmatory factor analyses (Hall & Edwards, 2002) and item response theory analysis (Hall et al., 2007). It has been used in studies relating spirituality to anxiety (Pascanu et al. 2012), shame (Keller et al, 2015), and substance abuse (Rabbani & Khormaei, 2017), with Chronbach's alpha ranging from .73 to .95 on different subscales.

"Moderately," and 32.6% responding "Strongly" or "Very Strongly." Of those who did describe being impacted by COVID-19 (n = 62), 54.8% gave completely negative descriptions (e.g. economic problems, death of someone they knew, anxiety, relational stress, and ministry problems), while 45.2% reported mixed or positive outcomes (e.g. improved hygiene, increased trust in God, understanding how to face challenges, personal revival, and shifts in perspective on things like life, material possession, God, relationships, etc.). While COVID-19 did have an impact on many lives, the relatively high rate of recognizing positive outcomes evident in their descriptions may reflect existing resilience.

Immediate Outcomes

Data from the pre- and post-tests were screened to eliminate incomplete surveys and account for missing data. Because of the low response rate for the long-term follow-up assessment (28%), statistical evaluation of short-term and long-term outcomes were conducted separately.

PTSD Symptoms

A paired-samples *t*-test was used to determine whether there was a statistically significant mean difference between the PCL-5 scores pre- and post-program. One outlier was detected that was more than 1.5 box-lengths from the edge of the box in a boxplot. Inspection of its values did not reveal it to be extreme and it was kept in the analysis. The assumption of normality was not violated, as assessed by Shapiro-Wilk's test ($p = .071$), and supported by an acceptable skewness of .555, and kurtosis of .283. Participants had higher rates of PTSD symptoms prior to the program (M = 28.62, SD = 15.597) than after the program (M = 22.24, SD = 14.787). Participation in the workshop elicited a statistically significant decrease in PCL-5 scores, M = 6.378, 95% CI [4.302, 8.453], $t(97) = 6.100$, $p < .001$, with a medium effect size ($d = .616$).

Prior to participation in the program, 40 of the participants (40.82%) scored ≥33 on the PCL-5, a cut-off suggesting a likely diagnosis of PTSD. Upon completion, only 23 participants (23.60%) were in that category, a 42.5% decrease. There was a greater effect size for those beginning above the ≥33 threshold, $t(39) = 5.680$, $p < .001$, with a large effect size ($d = .898$), compared to those below that threshold, $t(57) = 3.260$, $p = .002$, with a medium effect size ($d = .428$) (see Table 2). The average score decreased from 44.68 to 33.95, which is a difference greater than 10, a measure of clinically significant improvement.

Table 2
PCL-5 Summary of Pre-test and Post-test Means

Scale	Pre-test M	Pre-test SD	Post-test M	Post-test SD	t	df	p	d
PCL	28.62	15.60	22.24	14.79	-6.10	97	<.001	0.62
PCL, Pre-Test <33	17.55	8.56	14.17	9.49	3.26	57	.002	0.43
PCL, Pre-Test ≥33	44.68	7.163	33.95	13.22	5.68	39	<.001	0.90

Prior to beginning the program, the evaluation included the open question, "During the past year, have you experienced any individual traumatic events? If so, briefly describe what occurred." Although reports included a number of items that would generally not be considered traumatic (e.g. failed classes, inability to repay a loan, unfulfilled promises), there were more traumatic/stressful events reported in the Middle Belt locations than in the capital city (see Table 3). In each region there were reports of deaths of family or friends, a car accident, as well as health issues, family problems, and other stressful situations. In the programs further north, there were an additional ten reports of kidnapping and/or attacks of someone they knew or a location nearby. Post-hoc analysis was used to compare the initial PTSD scores between the six different groups. While one might expect there to be higher levels of PTSD in groups in the Middle Belt, there was no significant difference between the six groups in pre-program levels of PTSD (p = .612). When comparing the changes in PTSD symptoms pre- and post-program, there was also no significant difference between the six groups in the amount of change (p = .620). In addition, there was no significant correlation between the pre-program measure of PTSD symptoms and age (r = -.017, p = .866) or sex (r = -.005, p = .962).

Table 3
Reported Traumatic Event within the Past Year

Recent Traumatic Event?	Yes	No	Average PCL-5 Score (Pre-Program)
Abuja			
Group 1	5	10	22.23
Group 2	6	8	28.07
Group 3	9	8	29.26
Total	20 (43.5%)	26 (56.5%)	
Middle Belt			
Group 1	8	4	28.38
Group 2	16	2	30.00
Group 3	13	5	32.21
Total	37 (77.1%)	11 (22.9%)	

Spiritual Assessment

Data from the SAI were tested for normality. The most extreme outlier in the Disappointment subscale led to examination of one of the responses. It was unclear whether t e written comments), so the case was omitted. The data in all the subscale measures of changes in spiritual growth did not meet the Shapiro-Wilk's tests for normality (ranging from p < .001 to p = .042), each one had either a skewness or kurtosis greater than 1, and all measures had outliers.

Therefore, the Wilcoxon-signed-rate test was used to compare pre- and post-program measures, and data are medians unless otherwise stated.

The participation in the program elicited a statistically significant median increase in the Awareness of God measure, $z = 3.13$, $p = .002$. Although the measure for Instability did decrease, there was no statistically significant median change, $z = -1.473$, $p = .141$. Similarly, there was no statistically significant median change in the Disappointment with God measure, $z = -1.277$, $p = .202$. There was no statistically significant difference in Realistic Acceptance, $z = 1.198$, $p = .231$, although it did improve (see Table 4).

Open Responses

Of the 98 participants, 92 included written answers to open questions. When asked what was most helpful in the training, the vast majority (n = 69, 75.00%) included a reference to experiencing the primary intervention, the Immanuel Intervention, some giving more specific descriptions of how it facilitated their spiritual encounter with God. The other dominant responses were the teaching content (n = 22, 23.91%), the Lectio Divina practice (n = 14, 15.21%), and development of skills to help others (n = 14, 15.21%).

Looking deeper into how the Immanuel Intervention was influential, participants were asked if they had an encounter with Jesus and, if so, how it impacted them. Five made references to an experience that occurred earlier in their history, while the rest all reported having a positive experience encountering Jesus during the program. Many gave more specific descriptions, the most dominant theme being an influence on their perception of and/or relationship to Jesus (57.61%), including a greater awareness of His presence (e.g., "The encounter calmed me down and gave me assurance of his presence and provision."), increase in trust (e.g., "It actually influenced me greatly as my heart was strengthened to trust his presence always and never to be afraid of anything."), and a transformation of memories (e.g., "Recalling the joyful past and Jesus' presence was helpful to bring release from past painful events and its memories."). There were numerous reports (39.03%) of reduction in negative emotions (e.g., pain, fear, bitterness) and increase in positive emotions (e.g., joy, peace, gratitude, freedom). For some this included the significance of personal growth (e.g., "It helps me to forgive more easily, have more desire for prayer, studying the Word of God, fellowship with other believers, high desire for reaching out to people with the Word of God."). A smaller proportion (8.70%) added increased ability to help others (e.g. "Woah! In so many ways, it's like through my experience of encounter, I received a tool to carry on with what I am supposed to do, how I am supposed to live and act and also what will help me be able to reach others for the Lord: helping others connect with Jesus."). Both spiritual growth and emotional transformation appear to be strongly generated.

Long-Term Outcomes

Unfortunately, only 27 participants out of the sample of 98 completed all three evaluations. One of these participants did not include enough information to match with a previous evaluation (using an ID code that didn't match any and having the same age, gender,

and group number as more than one previous participant). Therefore, this participant could not be included in the statistical analyses. Power analysis was conducted based on an assumed effect size of 0.5, alpha level of 0.05, and desired statistical power of 0.80. With a sample of 26, the calculated power for the study was 0.22 for PTSD symptoms, suggesting that the study may have limited ability to detect effects, and the results should be interpreted with caution. The average age was younger than the larger sample (39.72 compared to 47.13) and while males were still the majority, with 53.8%, there was less of a gap.

PTSD Symptoms

A similar proportion of this smaller sample began with a PCL-5 score of ≥33 (38.46%) compared to the larger sample (40.82%). A one-way repeated measures ANOVA was conducted to determine whether there were statistically significant differences in PTSD symptoms prior to the program, upon completion, and nine months later. The data were tested for normality and one extreme outlier in the post measure was changed from 66 to 60, maintaining a score higher than the next while also allowing for normality. After that, PCL-5 scores were normally distributed at each time point, as assessed by Shapiro-Wilk's test ($p > .05$). The assumption of sphericity was met, as assessed by Mauchly's test of sphericity, $\chi^2(2) = 5.098$, $p = .078$. The Tree of Life program elicited statistically significant changes in PTSD symptoms at different time points, $F(2, 50) = 5.134$, $p = .009$, partial $\eta^2 = .170$.

There was a significant decrease in PTSD symptoms from prior to the program ($M = 26.346$, $SD = 15.945$), to the completion of the program ($M = 18.96$, $SD = 14.62$), and an additional but small decrease after nine months ($M = 17.885$, $SD = 13.518$). Post hoc analysis with a Bonferroni adjustment revealed that PTSD symptom reduction was statistically significantly from pre-program to completion (mean decrease of 7.853, 95% CI [1.582, 13.187], $p = .009$), but not from completion of the program to nine months later (mean decrease of 1.077, 95% CI [-6.318, 8.471], $p = 1.00$).

The maintenance of the improved score is present despite reports of stressful or traumatic incidents from some of the participants ($n = 8$) within that nine-month period, including reports of a nearby attack of bandits, a home being burnt down, the death of a family member, thieves, and the diagnosis of cancer for a mother. To determine the impact of these events, an analysis was performed comparing those who had and had not reported a distressing event. Based on Levene's test for equality of variances, the variables demonstrated homogeneity. For PTSD symptoms, there was a much higher score for those who had experienced a distressing event ($M = 31.875$, $SD = 10.29$) compared to those who had not ($M = 11.33$, $SD = 9.94$), which was statistically significant $M = 20.54$, 95% CI [11.38, 29.70], $t(21)4.67$, $p < .001$. This factor had a very large effect size, $d = 2.04$, suggesting that overall, PTSD symptoms continued to decline for those without more distressing events, but were once again elevated for those with additional exposure (see Figure 1).

Figure 1

Changes in PTSD Symptoms: Pre, Post, and Follow-Up Scores
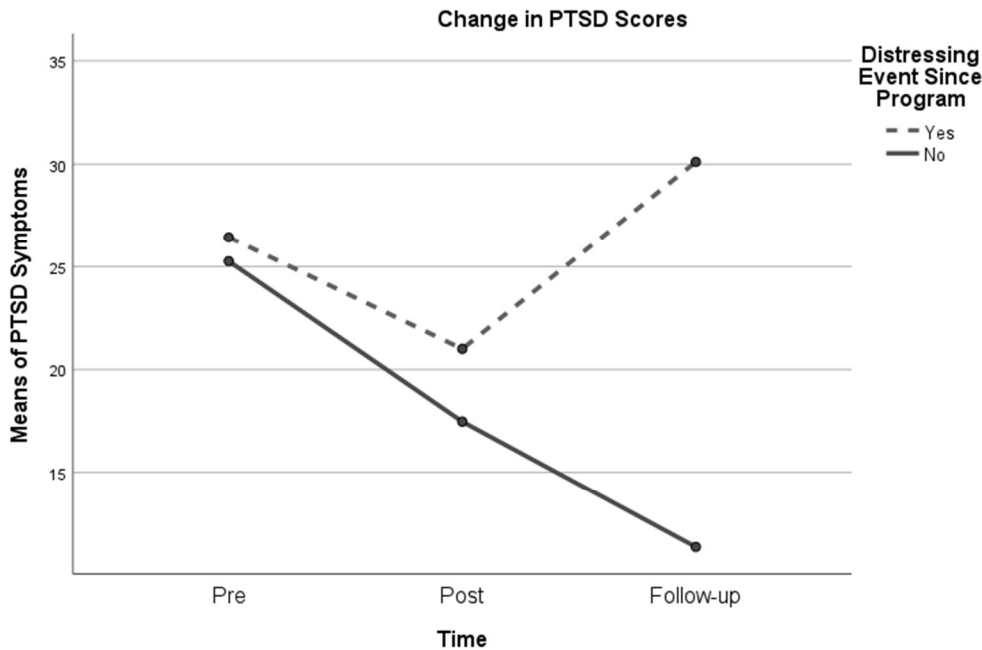
Spiritual Assessment

Because the SAI subscales did not meet the tests for normality (as described above), the Friedman test was conducted to determine whether there were statistically significant differences in measures prior to the program, upon completion, and nine months later. Pairwise comparisons were performed with a Bonferroni correction for multiple comparisons when there was a significant difference.

The differences for Awareness of God were not statistically significant, $\chi^2(2) = 4.42$, $p = .110$, with an increase from pre (*Mdn* = 4.32), to post (*Mdn* = 4.55), but the follow-up being the same as pre-program (*Mdn* = 4.32). Likewise, for measures of Instability the differences were not statistically significant, $\chi^2(2) = 1.936$, $p = .380$, but there was a slight decline from pre (*Mdn* = 2.833), to post (*Mdn* = 2.556), to the follow-up (*Mdn* = 2.333).

Disappointment was statistically significantly different at the different time points, $\chi^2(2) = 6.08$, $p = .048$. Post hoc analysis revealed a statistically significant decrease between pre- (*Mdn* = 2.64) and post-program (*Mdn* = 1.857, $p = .018$), but not between the post-program to and nine-month follow-up (*Mdn* = 2.29, $p = .332$). For Realistic Acceptance, the differences were not statistically significant, $\chi^2(2) = 2.92$, $p = .233$, between pre (*Mdn* = 4.286), post (*Mdn* = 4.286), and the follow-up (*Mdn* = 3.929).

A post-hoc analysis was performed to determine whether the presence of a reported distressing event that occurred between the program and the follow-up had an impact on spiritual well-being. Based on Levene's test for equality of variances, all variables demonstrated homogeneity of variances except for Instability, which was then evaluated based on equal

variances not assumed. Of the subscales for spiritual well-being, only Disappointment was significantly higher for those who reported a distressing event, $M = .87$, 95% CI [-.001, 1.75], $t(21)2.08$, $p = .050$, $d = .91$. Awareness of God was slightly lower but not significant, $M = -.18$, 95% CI [-.65, .29], $t(21)-.80$, $p = .218$. Realistic Acceptance was slightly higher, but not statistically significant, $M = -.18$, 95% CI [-.73, 1.09], $t(21).42$, $p = .679$. Instability was also higher, but not statistically significant, $M = .73$, 95% CI [-.24, 1.69], $t(21)-.80$, $p = .122$ (with equal variance not assumed), although it did appear to have a large effect size, $d = .91$.

Discussion

This study sought to test the impact of the Tree of Life program on participants' well-being, both clinically and spiritually, in a high-trauma, low-resource setting. As hypothesized, PTSD symptoms significantly decreased, with a moderate effect for the whole group and a large effect for those initially experiencing high symptoms of trauma, supporting the previous studies (Bresser, 2022, Hervey, 2023). Although the initial rate of a likely diagnosis of PTSD was lower than the previous study in Nigeria (41% vs. 51%), it remained substantially higher than the estimated LMIC prevalence (3%) (Koenen et al., 2017). Notably, participants weren't selected based on trauma history but on potential as care providers. In other words, participants were maintaining functionality and contributing to society, while still experiencing high PTSD symptoms and not receiving treatment. This pattern reflects the underreporting of PTSD and the large treatment gap. Geographical differences didn't influence PTSD rates, prompting further exploration into trauma causes in areas lower in conflict. The prevalence of trauma underscores the need for sustainable, non-professional task-sharing approaches like this program.

It was also hypothesized that there would be some improvement in spiritual well-being. Although only Awareness of God demonstrated a statistically significant difference between pre and post measures, all four sub-scales showed some level of improvement. One potential reason why the change was not greater, was the initial demonstration of relatively high scores in Awareness or God and Realistic Acceptance, and low scores of Instability and Disappointment. The ceiling effect and floor effect may contribute to the limits in statistically significant change. At the same time, these initial scores may reflect patterns of spiritual resilience, having already developed positive coping mechanisms that were incorporated into their spiritual lives.

The open questions further illustrated self-perception of spiritual growth and transformation. The vast majority described significant encounters with Jesus, with a strong emphasis on increased intimacy with him and shifts in their perceptions of God. The descriptions of transformed memories confirmed successful outcomes in reducing negative reactions to traumatic memories as a direct result of the primary intervention. While there was no quantitative measure of other aspects of psychological wellbeing, another common trend in these responses suggested significant improvement in emotions (e.g. increased joy, decreased pain) and relational mindsets (e.g. increased forgiveness, decreased bitterness). The experiential encounter with God in positive memories increased levels of intimacy and trust, while encounters in painful memories reprogrammed the brain on both emotional and cognitive levels.

In addition, the close interactions and development of trust with other participants and the facilitators may tap into the power of interpersonal support in recovery from trauma. Increased openness during the program allows leaders to feel accepted and validated in a culture where it is often not acceptable for leaders to share "weak" emotions.

The second goal was to test the long-term outcomes of this intervention, expecting sustained reductions in PTSD symptoms and enhanced spiritual well-being. The small sample calls for caution in interpretation, but of those participants the maintenance of reduced PTSD symptoms was confirmed, demonstrating positive long-term results. However, participants experiencing additional distressing events exhibited elevated PTSD symptoms, suggesting the potential benefits of follow-up interventions. At the same time, those without additional distressing experiences continued in the healing process, suggesting long-term positive effects. Further research with higher participation rates is needed to confirm these conclusions.

Interpreting the lack of significant change in spiritual well-being measures between the program and follow-up is challenging due to the small sample size. Notably, most spiritual well-being measures remained stable, with only Disappointment with God scores significantly increasing for those who experienced additional distress. When looked at in conjunction with the other consistent scores, it is evident the higher feelings of disappointment in the midst of trauma did not hinder the maintenance of awareness of God or acceptance of reality, suggesting patterns of spiritual resilience in adversity.

Limitations and Future Research

Because this program was being implemented for both research and the well-being of the local community, random selection was not utilized. Although the sample was broader in geographical location and type of participant than the previous study in Nigeria (Hervey, 2023), lacking a control group limits comparability, as change could come from other factors such as regression-to-the-mean, reduction of stress when having a break from their typical schedule, expectation for improvement (the placebo effect), or other unknown factors. In addition, it is difficult to determine how much of the change was directly from the intervention, and what came from the experience of building relationships, having a safe environment for processing and validation, and the practice of meditating on Scripture. While all of these are intended to play a role, level of impact for each one has not been measured.

Follow-up data collection had low participation rates, raising challenges in drawing accurate conclusions. While the smaller sample had a similar rate of likely PTSD diagnosis prior to participation, there are many other factors that make it difficult to determine if they were an accurate representation of the larger group. Nevertheless, initial evidence of long-lasting beneficial outcomes is hopeful. The impact of subsequent distressing events also should be taken into consideration; outcomes of follow-up maintenance care in such situations may also be valuable.

Using alternative measures of well-being may also prove revealing, as positive outcomes related to psychological and relational well-being were evident in the open questions. Assessing

improvement in related symptoms, such as depression, may demonstrate additional forms of recovery. Measures of post-traumatic growth may also expand the understanding of the effects of the program. Using measures that have already been validated in the local culture would be optimal; in the current study not all measures of spiritual well-being proved to be reliable.

Finally, studies conducted in other contexts may broaden the generalizability of the findings. While randomized controlled trials can be difficult in low-income countries, inclusion of a control group could offer valuable comparative data. Implementing it in similar contexts with high rates in PTSD and large treatment gaps could benefit the local community and the academic community when exploring cross-cultural effectiveness and addressing different sources of trauma.

Conclusion

Overall, this study provided further evidence on the effectiveness of the Tree of Life program with its implementation of the Immanuel Intervention, especially for those experiencing high levels of PTSD symptoms. While not part of the research itself, the way the program was coordinated and funded primarily on a local level in a low-income country reflects promising patterns of sustainability and potential for task-sharing. Previous participants are currently in the final stages of translating the material into the local language. As they become facilitators and instructors through supervised practice and advanced training, the impact can reach far beyond the initial program. This process may have promising potential in other LMICs with theistic-centered cultures and high rates of exposure to potentially traumatic events.

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