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Spiritual Well-Being Among Users and Non-Users of Psychedelics: A Cross-Sectional Study

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ABSTRACT

This study evaluated the psychometric properties of the Spiritual Well-Being Scale (SWBS) in a Brazilian sample. We analyzed spiritual well-being, defined as existential well-being (EWB) and religious well-being (RWB), among individuals with varying religious and spiritual experiences, both users and non-users of psychedelics. The online cross-sectional survey was conducted in Brazil, from April to June 2022. The psychometric analyses demonstrated reliability and validity based on the internal structure and the relationship with satisfactory external variables concerning the RWB and EWB factors of the SWBS. Validity evidence was shown for both factors (RWB, EWB) with adequate reliability ratings. However, the RWB factor, which was entirely replicated, demonstrated the best group differentiation and internal consistency. Although both factors showed validity, the RWB factor exhibited superior psychometric indices for validity, group discrimination, and reliability. Regarding psychedelics, the association with RWB and EWB demonstrates a U-shaped pattern, as participants who never use these substances typically exhibit higher RWB and EWB indices, succeeded by frequent users. This finding underscores the need for additional studies to further explore the intricate interplay between psychedelics and spiritual well-being.

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Spirituality; religiosity; spiritual well-being; psychedelics

Introduction

Measuring intangible phenomena, such as emotions, values, and intelligence, requires the development of systematic and scientific indicators (Ellison 1983). In the mid-1980s, quality of life and subjective well-being assessments emerged as more accurate alternatives to the economic indicators of the time (Ellison 1983). Recognizing that quality of life tools largely overlooked the religious dimension, and considering its impact on well-being, developed the Spiritual Well-Being Scale (SWBS) to assess religious and existential well-being (Paloutzian and Ellison, 1982; Ellison 1983).

The SWBS was devised based on the theoretical assumption that spiritual well-being encompasses both a religious and a social-psychological component, aligning with the theories of Moberg (1979), Blaikie and Kelsen (1979), and Ellison (1983). Moberg (1971) posited that spiritual well-being consists of a vertical component (a sense of well-being in relation to God) and a horizontal component (a sense of life purpose and satisfaction without religious references). Ellison (1983) described spiritual well-being as "an underlying state of spiritual health" and an expression of it, akin to skin coloration and a heartbeat signifying good health, consequently, measurements of spiritual well-being can be likened more to a stethoscope than the heart itself.

Historical and anecdotal evidence shows that natural sources of psychedelics (such as mescaline, found in *Lophophora williamsii* - peyote cactus) have been used in religious contexts for centuries due to their potential to induce profound spiritual and mystical experiences (Lerner and Lyvers 2006). Psychedelics have been central to the spiritual practices of various cultures since ancient times (Móró et al. 2011; Podrebarac et al. 2021), often involving shamanic rituals as the traditional setting for most psychedelic use (Winkelman 2021). Presumably, because of their spirituality-related effects, psychedelic plants like peyote, ayahuasca, and *Psilocybe* mushrooms have been integral to the traditional spiritual and healing ceremonies of some Native cultures in the Americas (Lerner and Lyvers 2006; Schultes and Hofmann 1979). While recent research has focused on

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investigating the therapeutic potential of psychedelics, studies conducted among users suggest additional motivations for using these substances, such as self-growth and spirituality (Neitzke-Spruill; Glasser, 2018). In this context, the use of appropriate assessment tools can facilitate research on spirituality and psychedelics.

The SWBS is one of the most widely used instruments globally in clinical research for assessing the spiritual well-being construct (Monod et al. 2011), although further psychometric evaluations and larger samples are needed for increased precision (Forti, Serbena, and Scaduto 2020). The present study evaluate the psychometric properties of the SWBS in a Brazilian sample. We analyzed spiritual well-being, using constructs of existential well-being (EWB) and religious well-being (RWB), among individuals with varying religious and spiritual experiences, both users and non-users of psychedelics.

Methods

Study design, sampling, and recruitment

This is an online cross-sectional survey study conducted in Brazil, with online data collection taking place from April to June 2022.

The sample required a minimum of 200 participants (adults of any gender and health status), following the recommendation of 10 subjects per instrument item for studies investigating validity evidence based on the internal structure, obtained through factor analyses (Terwee et al., 2007). The total number of valid respondents reached 517.

Initial publicity for the study was conducted through the researchers' networks, primarily via messaging applications (WhatsApp, Telegram) and social media platforms (Instagram, Twitter). Potential participants were encouraged to share the research among their peers. Participants received a message explaining the study and a link to access an online form containing the consent form and instruments, which were all self-administered.

Measures

Participants began by completing an initial questionnaire about their age (in years), gender, level of education, professional profile, spirituality and religiosity, and psychedelic substance use.

Spiritual Well-Being Scale (SWBS)

The SWBS, developed by Paloutzian and Ellison (1982), was initially validated in Brazil by Marques, Sarriera, and Dell'aglio (2009). The scale consists of 20 questions divided into two subscales, religious well-being (RWB, $\alpha = 0.92$) and existential well-being (EWB, $\alpha = 0.85$), which participants respond to using a six-option Likert-type scale: Totally Agree, Agree More Than Disagree, Partially Agree, Partially Disagree, Disagree More Than Agree, and Totally Disagree (Marques, Sarriera, and Dell'aglio 2009). The scores for each subscale are calculated by summing the responses to the items within them (Marques, Sarriera, and Dell'aglio 2009).

Procedures

An online form was created using the Google Forms platform and tested for usability and functionality with a group of 10 participants (who were not part of the final sample). The invitation and link to access the survey were disseminated via messaging applications and social networks. After completing the electronic consent form, participants were directed to answer the self-assessment tools. If participants chose not to participate, they were directed to a page thanking them for considering participation. Participation was considered effective only when the instruments were fully completed.

Data analysis

Initially, factor analyses were conducted to evaluate the dimensionality of the SWBS using exploratory structural equation modeling (ESEM) (Aparuhov and Muthen 2009), the robust weighted least squares method (WLSMV), and GEOMIN oblique rotation. These analyses were performed using Mplus 8 software (Muthén and Muthén 1998–2017). Parallel analyses (Horn 1965) were employed to indicate the number of factors to be extracted. The reliability of the extracted dimensions was assessed using Cronbach's alpha and composite reliability coefficients, with values above 0.7 expected (Valentini and Damásio 2016).

Subsequently, analyses were carried out to determine the extent to which participants exhibited significant differences ($p \leq .05$) in factor scores as measured by the SWBS. In cases where variables could be divided into two groups, the Mann-Whitney (M-W) test was used. For cases with three or more groups, the Kruskal-Wallis test was applied. Post hoc analyses were employed to better understand any identified differences (Hair et al. 2010).

To evaluate the predictive power of explanatory variables (sociodemographic, professional, and spirituality/religiosity-related variables) on EWB and RWB, two multiple linear regression models were adjusted using the stepwise method. The models were selected based on the lowest Akaike Information Criterion (AIC) and highest coefficient of determination. The quality of fit was also assessed by examining the

residuals, using the Shapiro-Wilk test for normality and the presence of multicollinearity by the variance inflation factor (VIF). For the analysis of the dichotomized variable "use of psychedelics" (1 = no [never/almost never], 0 = yes [occasionally/frequently]) in relation to variables related to religiosity, logistic regression with a logit link function and the forward procedure were employed for variable selection and the final model choice. The Chi-squared test and the Hosmer and Lemeshow test were used to verify model fit and quality of fit. The tests were performed at a 5% significance level.

Study procedures were approved by the Federal University of Alfenas Research Ethics Committee. All participants received written information about the research, and they provided informed written consent before participating in the study.

Results

Sample profile

The sample consisted of 517 participants, with a mean age of 38.76 years (standard deviation = 12.06; range = 19 to 76). Additional data related to the participants' profile are presented in Table 1.

Psychometric properties – dimensionality and reliability analyses of the SWBS

Parallel analysis results (Horn 1965) indicated the relevance of extracting up to two factors, equivalent to EWB and RWB (Supplementary material).

Two factorial solutions were extracted for the SWBS. For the one-dimensional model, Comparative Fit Index (CFI) = 0.88, Tucker-Lewis Index (TLI) = 0.87, and Root

Table 1. Sample profile ($n = 517$).

Variables/Groups	n	%
Gender		
Female	330	63.8
Male	182	35.2
Other	5	1
Age group		
≤30 years	141	27
31 to 40 years	181	35
41 to 50 years	105	20.5
≥51 years	89	17.5
Education		
Up to High School	30	5.8
Undergraduate (inc./comp.)	204	39.4
Graduate (inc./comp.)	283	54.8
Is a healthcare professional or student?		
Yes	274	53
No	243	47
Do you often talk about death/finitude?		
Yes	433	83.7
No	84	16.3
Do you have a serious illness?		
Yes	43	8.3
No	474	91.7
Religion		
I have no religion, but I consider myself spiritualized	242	46.8
I have no religion and do not consider myself spiritualized	61	12
Catholic	70	13.5
Evangelical/Protestant	13	2.5
Spiritualist	48	9
Buddhist	6	1.2
Afro-Brazilian religions	24	5
Other*	53	10
Do you practice your religion?		
Yes	117	22.5
No	117	22.5
Not applicable	223	55
How important is religion/spirituality in your life?		
Nothing	35	7
A little	77	15
Important	144	28
Very importante	261	50
Use of psychedelics**		
Never	175	34
Almost never	56	11
Occasionally	112	21.5
Frequently	174	33.5

*Ayahuasca religions such as *Santo Daime* and ayahuasca neoshamanic groups.**LSD, ayahuasca, DMT, psilocybin-containing mushrooms, ibogaine, cannabis, MDMA, among others.

Mean Square Error of Approximation –(RMSEA) = 0.156 (95% CI = 0.15 to 0.16]. For the two-dimensional model, CFI = 0.97, TLI = 0.96, RMSEA = 0.08 (95% CI = 0.07 to 0.08), and standardized root mean residual (SRMR) = 0.04. IOnly the two-factor model presented satisfactory fit indexes (Hair et al. 2010; Kline 2011). Table 2 summarizes the estimated parameters for this two-factor model.

The factorial matrix reproduced 90% of the configuration presented by Marques, Sarriera, and Dell'aglio (2009). Only two items were grouped differently from what was observed in that study: item 02 "I do not know who I am, where I came from, or where I am going" and item 20 "I believe that there is some true purpose to my life." Both items, originally from Factor 2 (EWB), were included in Factor 1 (RWB) in this study. Since this failed to present theoretical plausibility and caused problems with the interpretation of Factor 1, it was decided to exclude these items from the instrument's structure in the current study. Moreover, one item (18. "Life does not have much meaning") had loadings higher than 0.30 in more than one factor and was interpreted in the dominant factor with the highest saturation (factor loading), which is Factor 2 (EWB).

Both factors were moderately associated (Φ = −0.39), and the estimated reliability/precision for the well-being factors was adequate, with coefficients higher than the minimum indicated in the literature (RWB α = 0.94, CC = 0.96, EWB α = 0.83, CR = 0.85).

Comparisons of RWB and EWB between groups

Factorial scores were created based on the simple arithmetic means of the responses to the items grouped in the SWBS factors (Supplementary Material). These scores can range from 1 to 6, and the interpretation occurs in the positive direction of the items/factors; that is, the higher the score, the higher the agreement with the content of the item/factor.

Regarding age, according to Spearman's correlation coefficient, the higher the age, the higher the RWB (r = 0.01, p = .82) and the EWB (r = 0.2, p < .001). When comparing RWB and EWB levels between groups using sample profile variables, women scored significantly higher in religious (m = 4.21) and existential (m = 4.30) well-being compared to men (m = 3.60 RWB, m = 4.05 EWB) (Table 3). The group with lower education presented significantly higher mean scores (m = 4.79 RWB, m = 4.47 EWB) compared to the group with higher education (m = 3.87 RWB, m = 4.30 EWB). Healthcare students/professionals (m = 4.21 RWB, m = 4.34 EWB) also showed significantly higher scores on the assessed dimensions of well-being compared to other participants (m = 3.75 RWB, m = 4.06 EWB).

Those who usually talk about death/finitude scored significantly higher on the existential well-being dimension (m = 4.26) compared to those who do not usually discuss these topics (M = 3.92) (Table 3). As for psychedelics, in general, participants who never use these substances exhibited better RWB and EWB indices compared to other participants (Table 3). However, participants who used psychedelics "often" showed better RWB and EWB scores than those who used them "almost never" or "occasionally" (Table 3). Additionally, according to Spearman's correlation, the more frequent the use of psychedelics, the lower the RWB (r = −0.92, p = .037) (there was no difference in EWB).

Table 2. Factorial matrix estimated for the SWBS (n = 517).

Items	Factor 1 Religious Well-Being	Factor 2 Existential Well-Being	Correlation item-total r^{it}
03 - I believe that God loves me and cares about me.	0.94	0.13	0.79
19 - My relation with God contributes to my sense of well-being.	0.93	0.01	0.84
11 - I believe that God is concerned about my problems.	0.91	0.10	0.76
15 - My relationship with God helps me not to feel lonely.	0.88	−0.01	0.81
17 - I feel most fulfilled when I'm in close communication with God.	0.88	−0.04	0.82
07 - I have a personally meaningful relationship with God.	0.88	−0.04	0.83
01* - I don't find much satisfaction in private prayer with God.	−0.84	−0.01	0.74
05* - I believe that God is impersonal and not interested in my daily situations.	−0.76	−0.12	0.59
09* - I don't get much personal strength and support from my God.	−0.75	0.12	0.70
13* - I don't have a personally satisfying relationship with God.	−0.66	0.22	0.65
14 - I feel good about my future.	−0.11	−0.83	0.61
10 - I feel a sense of well-being about the direction my life is headed in.	0.00	−0.75	0.58
08 - I feel very fulfilled and satisfied with life.	0.00	−0.71	0.62
12* - I don't enjoy much about life.	−0.10	0.70	0.59
06* - I feel unsettled about my future.	0.02	0.65	0.52
04 - I feel that life is a positive experience.	0.29	−0.48	0.51
16* - I feel that life is full of conflict and unhappiness.	−0.16	0.48	0.50
18* - Life doesn't have much meaning.	−0.44	0.46	0.54
Number of items	10	08	
Cronbach's Alpha (α)	0.94	0.83	
Composite Reliability (CR)	0.96	0.85	

*Items inverted to calculate internal consistency/reliability scores and coefficients.

Table 3. Comparison of levels of religious and existential well-being between groups considering characterization variables.

		Religious Well-Being				Existential Well-Being			
Variables	n	m	sd	me[#]	p	m	sd	me[#]	p
Gender									
Female	330	4.21	1.49	4.50[a]	0.001[1]	4.30	1.01	4.37[a]	0.002[1]
Male	182	3.60	1.61	3.90[b]		4.05	1.00	4.25b	
Education									
Low (Less than high school/Graduated high school)	30	4.79	1.25	5.10[a]	0.007[2]	4.47	.98	4.37[a]	0.009[2]
Medium (Associate's degree, Bachelor's degree)	204	4.04	1.53	4.35[b]		4.04	1.07	4.12b	
Higher (Advanced degree – Master's, Ph.D.)	283	3.87	1.57	4.20[b]		4.30	0.96	4.37a	
Health professional or student?									
Yes	274	4.21	1.49	4.50[a]	0.001[1]	4.34	.97	4.50[a]	0.002[1]
No	243	3.75	1.58	4.00[b]		4.06	1.05	4.25b	
Do you often talk about death/finitude?									
Yes	433	4.04	1.53	4.40[a]	0.084[1]	4.26	.98	4.38[a]	0.013[1]
No	84	3.70	1.61	3.60[a]		3.92	1.13	3.94b	
Do you use psychedelics?									
Never	175	4.37	1.54	4.80[a]	<0.001[2]	4.37	.98	4.50[a]	<0.001[2]
Almost never	56	3.42	1.45	3.60[c]		3.69	1.09	3.87c	
Occasionally	112	3.57	1.48	3.90[c]		4.06	1.02	4.12bc	
Often	174	4.06	1.52	4.40[b]		4.29	0.94	4.37ab	

m=mean, me=median, sd=standard deviation.
1 Mann-Whitney test.
2 Kruskal-Wallis test.
Median, within each variable, followed by different letters are statistically different from each other.

Significant differences were also found for both dimensions of the SWBS when groups were compared using variables related to religiosity/spirituality as criteria (Table 4). In general, participants who reported having these experiences had significantly higher RWB and EWB scores compared to those who did not report experiencing them or reported them with less intensity (Table 4). According to Spearman's correlation, the more importance a person gives to religiosity/spirituality in their life, the higher the indices of RWB ($r = 0.67$, $p < .001$) and EWB ($r = 0.36$, $p < .001$).

RWB and EWB prediction

This section highlights the significant results obtained from the estimated regression models, which aimed to investigate the prediction of sociodemographic, professional, spirituality/religiosity-related, and psychedelic use variables on RWB and EWB. With respect to the predictive variables of RWB, it was observed that as the importance of religion and/or spirituality increased in the respondent's life, so did the levels of RWB (Table 5). A direct relationship with the presence of religion was identified, such that respondents who reported having a religion exhibited RWB levels on average 0.451 higher than those without a religion. Additionally, healthcare professionals or students demonstrated a higher mean RWB value of 0.305.

LSD usage displayed an inverse relationship with RWB, as individuals who used LSD had a scale value lower by an average of 0.272. As shown in the model, for each unit increase regarding LSD consumption (i.e., the

Table 4. Comparison between groups considering religious and spirituality variables for existential well-being and religious well-being.

		Religious well-being				Existential well-being			
Variables	n	m	sd	me[#]	p	m	sd	me[#]	p
Religion									
I have no religion, but I consider myself spiritual	242	3.84	1.41	4.0[b]	<0.001[1]	4.21	0.97	4.25[b]	<0.001[1]
I have no religion and do NOT consider myself spiritual	61	1.71	0.89	1.50[c]		3.38	1.04	3.50[c]	
I have religion[3]	214	4.81	1.08	5.00[a]		4.43	0.93	4.50[a]	
Religious practitioner									
No	117	3.90	1.44	4.20	<0.001[2]	4.03	1.01	4.12	<0.001[2]
Yes	177	4.94	0.98	5.10		4.50	0.90	4.62	
Not applicable	223								
Importance of Religion/Spirituality in life									
Nothing	35	1.36	0.41	1.20[d]	<0.001[1]	3.44	1.06	3.62[d]	<0.001[1]
Not much	77	2.40	1.01	2.40[c]		3.63	1.00	3.75[c]	
Important	144	3.89	1.18	4.00[b]		4.16	0.81	4.25[b]	
Very Important	261	4.87	1.10	5.20[a]		4.51	0.98	4.62[a]	

[a]Kruskal-Wallis test.
[b]Mann-Whitney test.
[c]Catholic, Protestant, Spiritualist, Buddhist, religions of African matrix, others.
[#]Median, within each variable, followed by different letters are statistically different from each other.

more recent the consumption: never used, used once in my life, used in the last 12 months, used in the last 30 days), RWB levels decreased by 0.272 (Table 5). Concerning ayahuasca, respondents who reported having used the substance once in their lives had a mean RWB value lower by 0.575 compared to those who had not used it (it should be noted that having used ayahuasca in the past 12 months or in the past 30 days was not significant to the model).

Regarding the model proposed in Table 5 for the variables influencing EWB values, it was determined that as the importance of religion and/or spirituality increased in the participant's life, so did EWB. This table also presents 95% confidence intervals for the estimates associated with the explanatory variables. Age was also significant in explaining EWB, and for each additional year of life, there was a mean increase of 0.014 in the EWB factor, which could reach 0.04, according to the 95%CI. Individuals who reported having a serious illness had, on average, a lower EWB value of 0.473 (Table 5).

The model in Table 5 considered how religiosity-related variables (having religious affiliation, considering oneself a religious practitioner) were associated with the lifetime use of any psychedelic. According to the results, only two variables were important for the model: having a religion and considering oneself a religious practitioner. Those with a religion were less likely to use psychedelics. Being a religious practitioner significantly increased the odds of using psychedelics (regardless of the psychedelic substance).

Discussion

The results indicated the emergence of two factors in the SWBS (EWB and RWB), consistent with the findings of Paloutzian and Ellison (1982) in their study on SWBS development, as well as Marques, Sarriera, and Dell'aglio (2009), who first aimed to validate the SWBS for Brazilian culture. In our study, the two factors demonstrated a moderate association with each other, and the estimated reliability for them was adequate. In the original version of the scale, ten items measure RWB, while another ten measure EWB (Ellison 1983). The RWB factor items contain an explicit reference to God, alluding to the personal relationship with God and determining whether the experience of closeness and faith contribute to well-being, satisfaction, and the absence of loneliness (Ellison 1983; Marques, Sarriera, and Dell'aglio 2009). The EWB factor items pertain to positive expectations about the future, optimism, and feelings of purpose in life (Marques, Sarriera, and Dell'aglio 2009). In our study, the RWB component exhibited a greater capacity to differentiate between comparison groups.

In the factor analysis of the twenty items comprising the original version of the scale, using Varimax rotation on data obtained from 206 college students, the items grouped as expected into two distinct factors (Ellison 1983). All items relating to religion/religiosity loaded onto the RWB factor. Conversely, existential items emerged into two subfactors: "life guidance" and "life satisfaction" (Ellison 1983). In the study by Marques,

Table 5. Religious well-being and existential well-being adjusted multiple regression model Estimates* and adjusted model for psychedelic use as a function of religiosity-related variables**.

				CI (95%)	
Model	*B*	*Std. Error*	*p*	*Lower Bound*	*Upper Bound*
Religious Well-Being					
(Constant)	1.028	.317	.001	.404	1.652
Importance of religion and/or spirituality in life	1.006	.084	.000	.841	1.171
LSD use	−.272	.078	.001	−.425	−.118
Having a religion	.451	.135	.001	.185	.718
I have used ayahuasca once in my life	−.575	.222	.010	−1.013	−.137
Is a healthcare professional or student	.305	.119	.011	.070	.540
Existential Well-Being					
(Constant)	2.572	.347	.000	1.889	3.256
Importance of religion and/or spirituality in life	.362	.080	.000	.204	.520
Age in years	.014	.005	.004	.04	.023
Self-reported serious illness	−.473	.202	.020	−.871	−.074
Adjusted model for psychedelic use as a function of religiosity-related variables					
Constant	.396	.243	.102		
Having a religion	−1.769	.322	.000	.091	.321
Is a religious practitioner	1.366	.304	.000	2.160	7.116

*In this table only the explanatory variables whose effects were significant, following data treatment through the *Stepwise* method, are presented.
**_Hosmer_ and _Lemeshow_ Test $p = .350$, Chi-squared test $p < 0{,}001$.

Sarriera, and Dell'aglio (2009), the twenty items were also grouped into two factors (RWB and EWB), consistent with the original version of the SWBS. However, in the present study, items 02 ("I do not know who I am, where I came from, or where I am going") and 20 ("I believe there is some true purpose to my life"), initially intended for the EWB factor, were grouped into the RWB factor. As a result, these items were excluded from the SWBS framework in this study due to the lack of theoretical justification for their reallocation, which could hinder the interpretation of the RWB factor.

The sample profile and the theoretical-religious foundation of the scale's creation may have influenced this result. In this study, most respondents (58.8%) did not have a religious belief. The SWBS is partially based on the Judeo-Christian conception of RWB, allowing its use across various religions that conceive of God in personal terms (Ellison 1983). Addressing the challenges of using such an instrument with non-religious participants, Malinakova et al. (2017) emphasize that in a highly secular environment, responses to religiously oriented instruments might be interpreted as respondents disapproving the wording of the items, as these items implicitly assume the existence of God or some form of religious belief.

Considering these observations, and based on the psychometric results obtained, it can be asserted that the SWBS serves as a reliable and suitable instrument for measuring EWB and RWB in Brazil. It differentiates groups of people according to their spiritual and religious experiences and psychedelic substance use. These results suggest evidence-based validity for the relationship between external variables and the construct (APA et al., 2014).

In this study, female participants, healthcare professionals or students, and those with less education exhibited higher levels of RWB and EWB. A study on spiritual well-being and mental health during the COVID-19 pandemic in Italy revealed that women had significantly higher levels of spiritual well-being (Coppola et al., 2021). According to the literature, the higher spiritual well-being scores among women could be attributed to their different coping strategies compared to men, and the greater compatibility of religious norms and beliefs with roles, profiles, and behaviors socially assigned to women (Hammermeister et al. 2005; Levin, Taylor, and Chatters 1994).

Healthcare professionals who are conscious of their own spirituality and possess higher levels of spiritual well-being tend to be more resilient (Meybodi and Mohammadi 2020). Concerning education, evidence shows its association with spiritual well-being, albeit in a manner conflicting with the findings of the present study. Studies by Fradelos (2021) and Mystakidou et al. (2008) suggest that higher levels of education correspond to increased spirituality or spiritual well-being. In Tavel et al. (2021) no statistically significant differences were found concerning education and spiritual well-being.

Results reveal that spiritual well-being increases with age, and age is one of the factors contributing to higher EWB (Table 5). In the Tavel et al. (2021) study on spiritual well-being in the Czech population, older participants exhibited higher mean spiritual well-being scores compared to their younger counterparts. This may be attributed to the existence of age cohorts (successive decline in religious beliefs from older to younger age cohorts) (Hamberg 1991) or an increasing need to reevaluate one's life and seek its meaning in light of the approaching end of life (Tavel, 2004; Tavel et al. 2021).

This latter point may also relate to another current finding, that participants who frequently discuss death or finitude had significantly higher EWB scores compared to those who do not usually engage in such conversations. However, according to the model presented in Table 4, individuals who reported having a serious illness had lower EWB scores. It is known that distress and suffering can arise from confronting an existentially threatening stressor, as a serious illness can challenge core expectations related to safety, relationships with others, justice, controllability, certainty, and hope for a long and fruitful life (Vehling and Kissane 2018).

Table 4 indicates that more religious individuals have greater spiritual well-being in general. In a study aiming to validate the SWBS among the Czech population, religious participants had higher mean RWB and EWB scores than non-religious participants (Tavel et al. 2021). Moreover, significant differences in spiritual well-being and RWB were observed between two religious groups, those who attended a religious temple and those who were unaffiliated (Tavel et al. 2021). Ellison (1983) suggests a strong positive relationship between spiritual well-being and religious beliefs and practices (e.g., doctrinal beliefs, worship orientations, devotional practices), which promote a sense of personal acceptance and foster an intimate, positive communion with God and the community.

Regression analyses from this study indicated that recent LSD use and non-recent ayahuasca use, for instance, are related to lower rates of RWB. Also, as presented in Table 5, considering oneself practicing a religion increases the chance of using psychedelics. Previous studies carried out with ayahuasca users indicate that regular and frequent use is associated with

higher intrinsic religiosity and quality of life scores, in addition to better mental health outcomes (Barbosa et al. 2009; Daldegan-Bueno et al. 2022). On the other hand, controlled clinical studies evaluating the effects of psilocybin in cancer patients found that a single administration of the substance produced improvements in parameters of spirituality and spiritual well-being (Agin-Liebes et al. 2020; Griffiths et al., 2016; Ross et al., 2016). In a review on psychedelics and their relationship with positive psychology and healthy human functioning and well-being, preliminary evidence was found that psychedelics can support and enhance psychospiritual practices (Jungaberle et al. 2018), for example, through improved levels of self-transcendence (Bouso et al. 2012), the possibility of mystical experiences, and ego dissolution (Barrett and Griffiths 2017; Griffiths et al. 2006).

Despite the literature highlighting the positive relationship between psychedelics and religiosity/spirituality, our study generally found that participants who never used these substances exhibited better RWB and EWB indices compared to other participants. In Lerner and Lyvers (2006) psychedelic users scored significantly higher on mystical beliefs (e.g., unity with God and the universe), life values, spirituality, and concern for others compared to other groups (non-psychedelic users, such as cannabis and amphetamines, and users of non-illicit social substances). It is possible that non-pharmacological factors (set and setting) play a significant role in the outcomes observed in each condition (Hartogsohn 2016, 2017). Factors such as motivations, intentions, expectations, and preparation for psychedelic use may vary considerably between sporadic ("recreational"), regular (ritualistic/religious use), or clinical trial participants. Furthermore, factors related to the physical and social settings associated with each type of use may also influence the experience and its outcomes (Perkins et al. 2021; Pontual et al. 2022; Studerus et al. 2012). However, studies evaluating the effects of psychedelics on spiritual well-being parameters are limited, leaving a gap in data clarifying the role of pharmacological and non-pharmacological factors on the assessed outcomes.

Since this is a study using self-report measures, it is not possible to establish cause and effect relationships among the investigated variables. The fact that an instrument for the evaluation of spiritual well-being was developed based on a Judeo-Christian conception of religious well-being and that the sample was mostly non-religious can be considered a limitation. The process of online data collection based originally on the personal contacts of researchers warrant caution in extrapolating results to the general population of Brazil.

Study results suggesting an association between lower scores in EWB and RWB and psychedelic users may be influenced by sample selection. It is possible that these users participating in this study were using psychedelics precisely to enhance or enrich a sense of spiritual and religious well-being, which may already be naturally low. In psychiatric research, for instance, it's observed that while individuals on antidepressants may exhibit higher depression rates, it's incorrect to infer that these medications cause increased depression. Therefore, we cannot conclude that the use of LSD/Ayahuasca is in any way degrading or diminishing the individual's EWB and RWB. Further research is needed for a better understanding of these matters.

Conclusion

The psychometric analyses demonstrated reliability and validity evidence based on the internal structure and the relationship with satisfactory external variables concerning the RWB and EWB factors of the spiritual well-being scale used. Validity evidence was shown for both factors (RWB and EWB) with adequate reliability ratings. However, the RWB factor, which was replicated entirely, demonstrated the best group differentiation and internal consistency. Although both factors showed validity evidence, the RWB factor exhibited superior psychometric indices for validity, group discrimination, and reliability.

Regarding psychedelics, the association with RWB and EWB demonstrates a U-shaped pattern, as participants who never use these substances typically exhibit higher RWB and EWB indices, followed by frequent users. This finding underscores the need for additional studies to further explore the intricate interplay between psychedelics and spiritual well-being.

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