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Translation and validation of the intrinsic spirituality scale to European Portuguese among medical students

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Background

Recent studies indicate that the spiritual needs of nearly 80% of patients in palliative care are inadequately addressed, negatively impacting their well-being and satisfaction with care [1]. Spirituality has become an increasingly vital component of holistic patient care, especially within palliative care settings, where addressing patients' emotional and existential concerns is paramount. As patients approach the end of life, their spiritual needs often become more pronounced, significantly impacting their sense of meaning, comfort, and overall well-being. Recognizing this, professional guidelines, such as those from the American College of Physicians [2], emphasize the importance of addressing spirituality in patient care, recommending that physicians explore key spiritual concerns with patients, including the role of faith in their illness, past experiences with spirituality, and the availability of support for discussing spiritual matters [2].

Over the years, numerous tools have been developed to assess spirituality within clinical contexts, consistently

showing that strong spiritual well-being contributes to better patient outcomes, including improved coping mechanisms, reduced anxiety, and a heightened sense of purpose during end-of-life care [3, 4]. However, many of these assessments have been validated primarily among English-speaking or culturally homogenous populations, creating a significant gap in their applicability across diverse linguistic and cultural settings [5].

While numerous studies have linked religiosity and spirituality to a wide range of positive health outcomes [6, 7, 8, 9], the scientific community continues to grapple with the challenge of clearly distinguishing between the two constructs. Often, religiosity and spirituality are used interchangeably in the literature, which can obscure their unique contributions to an individual's well-being [10].

William James, a pioneer in the psychology of religion, distinguished between religion—grounded in institutional beliefs, rituals, and practices—and spirituality, which is more personal and subjective, focusing on individual experiences of transcendence, meaning, and self-exploration. In essence, religion can be one avenue to experience spirituality, but spirituality exists as a universal human dimension independent of religious structures [11]. According to the 2020 European Association for Palliative Care (EAPC) guidelines, spirituality encompasses the dynamic aspects of human life related to meaning, purpose, transcendence, and connectedness to self, to others, to nature, to the significant and/or the sacred, both within and beyond traditional religious contexts. This differentiation is most relevant in palliative care, where understanding a patient's spiritual needs beyond their religious affiliation can significantly impact the quality of care provided.

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Recognizing this, researchers have sought to measure spirituality as a distinct construct, separate from religiosity. Hodge (2003) [12] directly addressed this issue by modifying Allport and Ross's (1967) widely used Intrinsic Religious Motivation Scale. Allport and Ross originally conceptualized "intrinsic religion" as an internalized faith that serves as a master motivation for life, guiding thoughts and actions while remaining less influenced by external factors [13]. However, the original scale was limited to assessing spirituality within explicitly religious frameworks. Hodge adapted it to tap spirituality in both religious and non-religious contexts, aligning with contemporary understandings of spirituality as a universal construct. The resulting Intrinsic Spirituality Scale (ISS) retained the theoretical foundation of intrinsic motivation while broadening its applicability to diverse populations, including non-theistic individuals.

In Portuguese-speaking countries, particularly in Portugal, while validated instruments exist to assess spirituality, tools that measure spirituality as an intrinsic construct, distinct from organized religious practices, are needed.

This study addresses this gap by translating and validating the ISS for use among Portuguese-speaking medical students. In doing so, it aims to provide healthcare professionals with a reliable and culturally appropriate tool to assess the spiritual needs of patients, enhancing spiritual care in palliative settings. The validation of the ISS in an increasingly secular society is crucial for improving spiritual care in Portugal and contributes to a deeper understanding of how spirituality influences patient care across diverse cultural backgrounds globally [14].

Methods

Purpose and study design

This study aimed to develop a European Portuguese version of the ISS to assess intrinsic spirituality among Portuguese medical students.

Specifically, the study addressed three primary questions: (1) How effectively does the translated ISS capture intrinsic spirituality among Portuguese medical students? (2) Does the translated ISS demonstrate robust psychometric properties, including internal consistency, convergent validity, and factor structure? (3) What cultural adaptations are necessary to ensure the ISS is relevant and comprehensible in the Portuguese context? The research was conducted in two key phases: translating the original ISS [12] via the back-translation method and validating the translated instrument [15].

Ethics committee approval

This study was submitted to the Ethics Committee of the Faculty of Medicine, University of Porto, and received approval on March 31, 2022 (46/CEFMUP/22). The

authors subsequently requested additional authorization from the Ethics Committee to administer the scale in person during classroom sessions to ensure high response rates, complete data collection, and reliable results [19]. This approval was granted on April 28, 2022.

The intrinsic spirituality scale

The ISS was developed by David R. Hodge in 2003 and is based on Allport and Ross's Intrinsic Religious Motivation Scale (1967). The ISS is designed to measure intrinsic spirituality and focuses on the role of spirituality as an individual's life motivation. It was developed to measure spirituality among both theists and nontheists, irrespective of whether they express their spirituality inside or outside a religious context. This modification involved removing explicitly religious references, such as "church" or "God," and rephrasing items to focus on intrinsic motivation and personal transcendence. Spirituality is defined as "one's relationship with God, or whatever one perceives as Ultimate Transcendence".

The scale's development involved administering a 37-item questionnaire, which included socio-demographic questions. Among the 17 spirituality-related items, some were newly created, whereas others were adapted from Allport and Ross's studies on intrinsic religion. The final instrument, tested on a convenience sample of 172 university students, identified spirituality as a unidimensional latent variable. The ISS comprises six items, with respondents completing each by selecting from an 11-point scale (0–10), reflecting the theoretical continuum underlying the construct (see Additional File 1).

The respondents' intrinsic spirituality level is indicated by the average score across the six items. A score of zero represents an individual for whom spirituality does not act as a motivating factor. Conversely, a score of ten indicates a person who is highly motivated by their spirituality. In the original study, the ISS demonstrated an overall Cronbach's alpha of 0.96 [12].

Authorization from scale authors

The researchers contacted the author of the ISS and the authors of the *Escala de Avaliação da Espiritualidade/Spirituality Assessment Scale* (EAE) [20] via email and obtained permission to use these scales in this study. The ISS author was contacted a second time by email to confirm the accuracy of the back-translation of the original scale.

Population and sample

A convenience sample was obtained, consisting of students from the 3rd and 4th years of the medical degree from only one Portuguese faculty. These students were specifically targeted due to their intermediate stage in

medical education, where they combine foundational knowledge with increasing exposure to clinical practice. This group was deemed representative of the target population for validating the ISS in a healthcare training context. International students were excluded because the aim was to validate the scale for use with the Portuguese population.

For factor analysis, it is recommended to have between 4 and 10 participants per variable, with a minimum of 100 participants, whereas some authors suggest a range of 200–300 participants as appropriate [16–18]. Additionally, a power analysis was conducted using G*Power version 3.1.9.7 to ensure adequate sample size. The analysis was based on a chi-square goodness-of-fit test, with the following parameters: significance level = 0.05, statistical power = 0.80, effect size = 0.20 (small to medium effect size), and degrees of freedom = 2, calculated for the model structure with 6 items and 1 factor. The results indicated that a minimum sample size of 241 participants would be sufficient to achieve the desired statistical power. REF6 and REF7.

Data collection

Initially, the Portuguese-translated versions of the ISS, EAE and sociodemographic questionnaire were sent via institutional email through Google® Forms to the aforementioned sample, resulting in 28 responses. This sample was used for a pretest, and the authors subsequently administered the translated scale, the EAE and the sociodemographic questionnaire in classroom settings between May 16 and 29, 2022. The data collected included the following: (1) sociodemographic data: age, sex (male/female), religion, year of study in the integrated master's degree in medicine, and whether the participant had attended a course or internship in palliative care; (2) EAE; and (3) ISS.

Students were recruited during classroom sessions at the beginning of scheduled lectures and all who have the inclusion criteria accepted to participate. The research team briefly introduced the study's purpose and invited all eligible students present to participate voluntarily. Classroom-based data collection was selected to maximize participation and ensure consistent administration [19]. Participants were provided with information about the study's objectives, ensured of anonymity and confidentiality, and gave written informed consent before completing the questionnaires. Students completed the scale in approximately 5–10 min under the supervision of the research team, who were available to answer any questions.

Statistical analysis

Reliability, construct validity, and convergent validity were assessed via internal consistency, a confirmatory

factor, and correlation analysis, respectively, to validate the European Portuguese version of the ISS.

Categorical variables were described by absolute and relative frequencies (n, %) while for quantitative non-normally distributed (age) and ordinal variables, medians and interquartile intervals [1st Q; 3rd Q] were used.

With respect to the ISS, item 1 had 20 missing values, representing 6.94% of the total sample, which were subsequently imputed via the expectation–maximization (EM) algorithm procedure [21], following the methodology applied in other validation studies of the scale [12, 22]. After the imputation of the missing values, the average of the scores for the six items of the scale was computed to obtain the ISS total score [12].

Convergent validity

To address the convergent validity of the proposed Portuguese ISS, we computed its correlation with the dimensions of the Spirituality Scale, which has already been validated for Portuguese participants [20]. The EAE was chosen as a criterion measure on the basis of its comprehensive approach to spirituality, which transcends specific religious practices. The EAE measures two dimensions: beliefs (e.g., “My spiritual/religious beliefs give meaning to my life”) and hope/optimism (e.g., “My faith and beliefs give me strength in difficult times”), conceptualizing spirituality as both a source of meaning and a mechanism for resilience [20].

The EAE's focus on the existential and horizontal dimensions of spirituality makes it an appropriate reference for validating the ISS, as both scales prioritize broader aspects of spirituality over strictly religious elements. This instrument, composed of 5 items with a Likert scale, demonstrated adequate overall internal consistency, with a Cronbach's alpha of $\alpha = 0.74$ in previous studies. In the present study, the internal consistency of the EAE was $\alpha = 0.717$, indicating that the instrument has adequate reliability. This result further supports the suitability of the EAE as a valid measure for assessing spirituality, which is essential for theoretical and empirical convergence with the ISS.

Internal consistency

The reliability of the translated ISS was assessed via internal consistency, which was evaluated through the Cronbach's alpha coefficient, the average interitem correlation, and the corrected item–total correlation. Cronbach's alpha, which evaluates the interrelations among items within a one-dimensional scale or subscale, is considered acceptable when its value exceeds 0.7. The average correlation between items should ideally range from 0.15 to 0.5, ensuring that the items measure the same construct without redundancy [23]. Furthermore, each item should correlate with the total score of the construct,

with corrected item–total correlations ranging from 0.3–0.7 [24]. The presence of ‘ceiling’ or ‘floor’ effects, which occur when more than 15% of respondents score at the theoretical maximum or minimum, respectively, can compromise the scale’s validity and must be checked [25].

Confirmatory factor analysis

Factor analysis should be utilized to ascertain whether the items constitute a single factor or dimension (overall scale) or multiple factors. When there is a clear hypothesis regarding the factor structure, as is the case with the ISS, whose factor structure has already been established [12] and confirmed in other translations [22], confirmatory factor analysis (CFA) is recommended [25]. In particular, in this study, CFA was used to test the hypothesis that the general construct of intrinsic spirituality, as measured by the ISS, comprises only one factor or construct.

CFA was performed via the maximum likelihood estimation method. Given the lack of multivariate normality among the six items, as indicated by a critical kurtosis estimate of 17.769, the Bollen-Stine bootstrap method was used to adjust the model fit indices [26].

The fit of the single-factor model was evaluated via several fit indices: the chi-square (χ^2) index, Tucker–Lewis index (TLI), comparative fit index (CFI), root mean square error of approximation (RMSEA) with 90% confidence intervals (CIs), and standardized root mean square residual (SRMR). The acceptable fit criteria were set as follows: TLI and CFI values close to or above 0.95, RMSEA values below 0.06, and SRMR values below 0.08 [27–30].

Factor loadings, standard errors, and standardized factor loadings were calculated for each item. Additionally, a path diagram was constructed to visually represent the model and the relationships between the items and the latent factor.

Statistical analysis was performed via IBM SPSS Statistics v.27, and confirmatory factor analysis was conducted via AMOS v.27 [31, 32]. *P* values less than 0.05 were considered significant.

Results

Sociodemographic characterization of the sample

Among the 288 respondents in this study, the median [1st Q; 3rd Q] age was 21 [20; 22] years. The majority of the sample was female (70%, $n = 201$) with respect to religious beliefs, most identified as Catholic (65.9%, $n = 189$), followed by atheists (17.1%, $n = 49$) and agnostics (13.6%, $n = 39$). Most participants were in the 3rd year of the Integrated Master’s degree in Medicine (65.6%, $n = 189$). Only 2.4% ($n = 7$) had attended a palliative care course or completed an internship with a palliative care team.

Characterization of the answers to the Escala de Avaliação Da espiritualidade

For the first two statements of the EAE, the percentage distribution of responses is relatively uniform across the four levels of the Likert scale (Table 1).

For the remaining three statements, the responses are more concentrated around “agree somewhat” and “strongly agree.” Regarding hope for the future, 88.5% ($n = 155$) of the respondents selected “agree somewhat” or “strongly agree.” Nearly the entire sample (91.4%, $n = 263$) agreed to some extent that their lives had improved. The importance of appreciating small things in life was recognized by 81.9% ($n = 278$) of the respondents (Table 1).

Characterization of the answers to the intrinsic spirituality scale

The responses obtained for the ISS were generally consistent, resulting in a similar median score of five across all the responses (Table 2).

The bold letter is the Portuguese translation performed by the authors following all the methodologies explicit throughout this article [15]. The English version from the original scale is in regular font [12].

Notably, higher scores were observed with the two statements related to growth and maturity, whether spiritual (in the second statement) or personal (in the fifth statement). The total score obtained for the ISS in this sample had a median of 5.3 (Table 2).

Table 1 Distribution of the answers to the EAE ($N = 288$), N (%)

	Don't agree	Slightly agree	Agree somewhat	Strongly agree
My spiritual/religious beliefs give meaning to my life. As minhas crenças espirituais/religiosas dão sentido à minha vida.	77 (26.7)	79 (27.4)	78 (27.1)	54 (18.8)
My faith and beliefs give me strength in difficult times. A minha fé e crenças dão-me forças nos momentos difíceis.	56 (19.4)	77 (26.7)	84 (29.2)	71 (24.7)
I see the future with hope. Vejo o futuro com esperança.	7 (2.4)	26 (9)	121 (42)	134 (46.5)
I feel like my life has changed for the better. Sinto que a minha vida mudou para melhor.	25 (8.7)	82 (28.5)	112 (38.9)	69 (24)
I learned to value the little things in life. Aprendi a dar valor às pequenas coisas da vida.	10 (3.5)	42 (14.6)	111 (38.5)	125 (43.4)

The regular letter is a free translation from the authors of this article to make it understandable to non-native Portuguese speakers. The bold letter represents the Portuguese version of the original scale [20].

Table 2 Distribution of the answers to the ISS (N = 288)

	Median [1st Q; 3rd Q]	Min– Max
Relativamente às questões que tenho sobre a vida, a minha espiritualidade (não dá resposta nenhuma ... responde a todas as minhas perguntas) In terms of the questions I have about life, my spirituality answers (no questions ... absolutely all my questions)	5 [2; 7]	0–10
O crescimento espiritual (não tem qualquer importância para mim ... é mais importante do que qualquer outra coisa na minha vida) Growing spiritually is (of no importance to me ... more important than anything else in my life)	5.5 [3; 7]	0–10
Quando estou perante uma decisão importante, a minha espiritualidade (não desempenha qualquer papel ... desempenha o papel principal) When I am faced with an important decision, my spirituality (plays absolutely no role ... is always the overriding consideration)	5 [2; 7]	0–10
A espiritualidade (não faz parte da minha vida ... é o que mais me motiva, orientando todos os outros aspetos da minha vida) Spirituality is (not part of my life ... the master motive of my life, directing every other aspect of my life)	5 [3; 7]	0–10
Quando penso naquilo que me ajuda a crescer e amadurecer como pessoa, a minha espiritualidade (não tem qualquer influência no meu crescimento pessoal ... é, sem dúvida, o fator mais importante no meu crescimento pessoal) When I think of the things that help me to grow and mature as a person, my spirituality (has no effect on my personal growth ... is absolutely the most important factor in my personal growth)	6 [3; 7]	0–10
As minhas crenças espirituais (não influenciam nenhum aspeto da minha vida ... influenciam completamente todos os aspetos da minha vida) My spiritual beliefs affect (no aspect of my life ... absolutely every aspect of my life)	5 [3; 7]	0–10
ISS – Total score	5.3 [2.8; 6.7]	0–10

Confirmatory factor analysis

CFA was pursued to confirm the single-factor structure of the six-item scale, as stated in published validations of the original [12] and a version of the ISS for Muslims [22].

The resulting one-factor model for the ISS (Fig. 1) exhibited a good model fit, with all fit indices indicating adequate or better values: $\chi^2(9)=18.9$, $p=0.026$; TLI=0.992; CFI=0.995; RMSEA=0.062 with 90% CI [0.021, 0.101]; SRMR=0.0095. Specifically, the examination of the standardized residual covariance matrix (see Additional File 2, Table S1) indicated no substantial residuals, with all values falling within the acceptable range (± 2.58), supporting the adequacy of the model fit. Since the multivariate normality of the six items was not supported by the critical kurtosis estimate (17.769), model fit can be addressed via the Bollen–Stine bootstrap [26] as an alternative to the χ^2 index.

When the null hypothesis that the model is correct is tested, the Bollen–Stine bootstrap $p=0.303$ indicates that the fit is adequate. The factor loadings obtained in the CFA were statistically significant. Their standardized estimates ranged between 0.862 and 0.948 (Table 3; Fig. 2), thus representing high validity coefficients in terms of measurements of the latent spirituality construct.

The reliability coefficients of the observed variables, as represented by squared multiple correlations, ranged between 0.743 and 0.898 (Fig. 2), with an average value of 0.83, supporting the high reliability of the scale. The error variances for the items ranged from 0.806 to 1.874, all statistically significant at $p<0.001$ (Additional File 2 - Table S2), indicating consistent variability in the measurement errors across the items.

Internal consistency

The six-item scale exhibited a Cronbach’s alpha of 0.966, with no improvement when any item was removed. The mean inter-item correlation was 0.829, and the item–total correlations ranged from 0.846 (item 2) to 0.926 (item 5, Table S3 in Additional File 2). No ceiling or floor effects were present, demonstrating that the Portuguese version is a highly reliable instrument for measuring spirituality.

Convergent validity

For convergent validity, the authors used the EAE. Data analysis revealed a significant positive correlation between the ISS and the EAE Beliefs subscale ($r=0.791$; $p<0.001$). Additionally, the ISS showed a weaker but still significant positive correlation with the EAE Hope/Optimism subscale ($r=0.326$; $p<0.001$; Table S4 in Additional File 2). This finding suggests that while the ISS is more strongly aligned with intrinsic spiritual beliefs, it also captures aspects of hope and optimism, confirming the construct validity of the Portuguese version of the ISS.

Discussion

Key findings and cultural validation

This study successfully translated and validated the ISS for the Portuguese population using a sample of 288 medical students. The ISS demonstrated excellent internal consistency (Cronbach’s alpha of 0.96) and strong convergent validity with the EAE, supporting its reliability and validity. CFA upheld the original unidimensional structure, confirming that the ISS is a clear, simple, and efficient tool for the rapid assessment of spirituality in this population.



Fig. 1 Translation and validation processes of ISS from English to European Portuguese

To our knowledge, only two prior studies have assessed the ISS factor structure across different cultural contexts. The Turkish and Muslim versions demonstrated strong internal consistency, with Cronbach's alpha values of 0.90 and 0.93, respectively, confirming the scale's reliability across diverse cultures [22, 33]. Exploratory and confirmatory factor analyses in these studies consistently supported the original factor structure, further validating

the ISS as a robust tool for assessing intrinsic spirituality across various settings.

However, some cultural nuances were evident. The Muslim version showed a strong correlation between intrinsic spirituality and formal religious practices, whereas the Turkish version revealed different item loadings, potentially reflecting cultural interpretations tied to specific Islamic faith concepts. In contrast, the Portuguese version captured a broader spectrum of spiritual

Table 3 Unstandardized and standardized coefficients (factor loadings) and standard errors for the one-factor structure of the ISS Portuguese version

Item number	Factor Loading	Standard Error	Standardized Factor Loading
1	2.447	0.128	0.884
2	2.326	0.127	0.862
3	2.672	0.139	0.89
4	2.58	0.121	0.944
5	2.68	0.124	0.948
6	2.555	0.122	0.933

All estimates are significant at $p < 0.001$.

expressions, including more individualized and less institutionalized forms of faith. These findings underscore the necessity of culturally adapting tools such as the ISS to ensure their relevance and accuracy, aligning with broader research on spirituality assessments [5, 34].

Convergent validity and theoretical implications

The EAE measures two dimensions of spirituality: beliefs and hope/optimism, conceptualizing spirituality as both a source of meaning and a mechanism for coping and resilience. The ISS's strong alignment with the EAE beliefs dimension supports its validity in capturing intrinsic

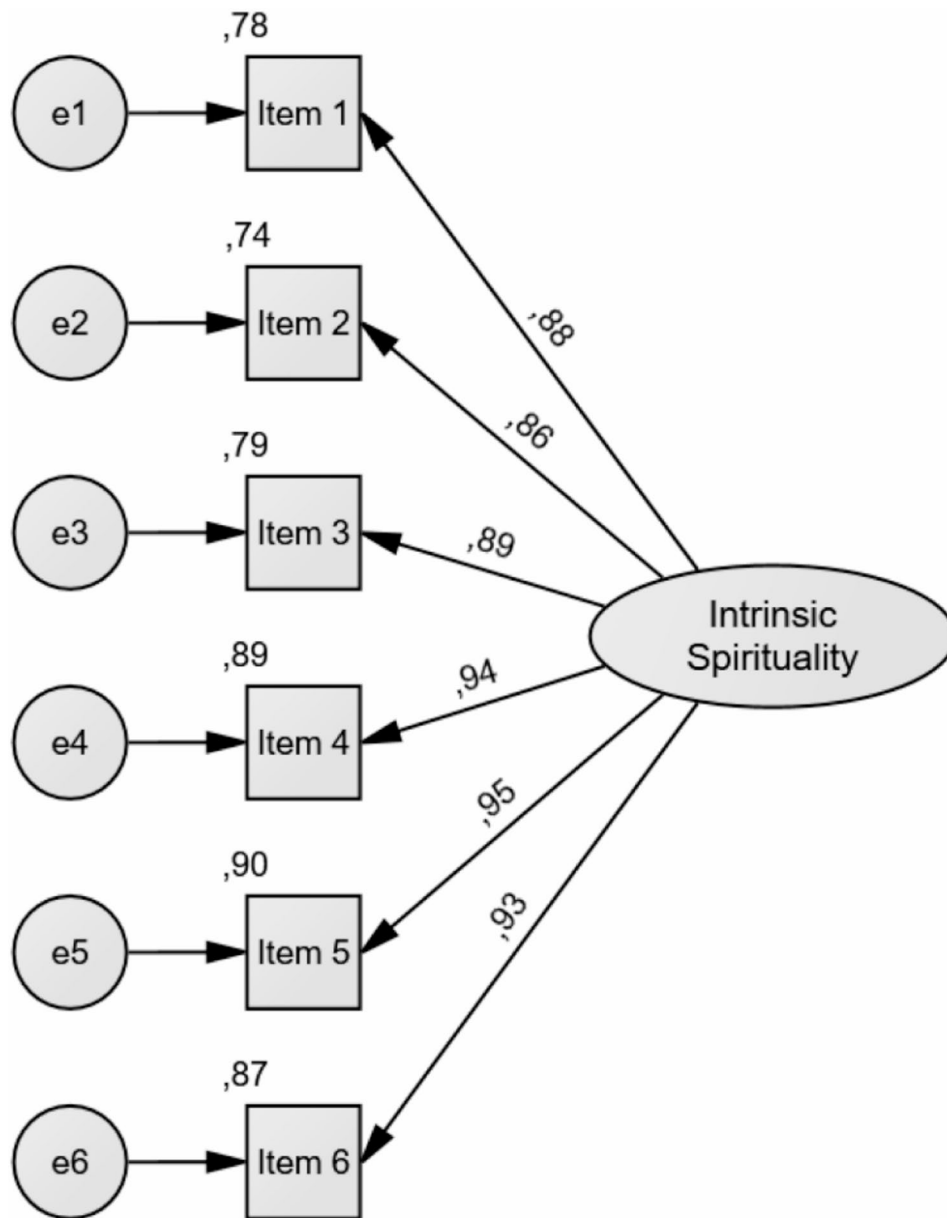


Fig. 2 Path diagram for the Portuguese version of the ISS in students ($N=288$). The observed ISS items are indicated with rectangles, and the unobserved factors are indicated with ovals. The item error measurements (e1–e6) are indicated by small circles. The values above the items are the model squared multiple correlations, and the values next to the single-headed arrows indicate standardized factor loadings

spirituality. In contrast, the weaker correlation with the hope/optimism dimension suggests that the ISS may not fully encompass broader psychological constructs such as resilience or emotional well-being.

This finding aligns with Hodge's theoretical distinction between spirituality and constructs like optimism, resilience, or coping, often emphasized in other scales. According to Hodge, spirituality is distinct from them, though it may contribute to these outcomes [12]. Furthermore, defining spirituality solely as a coping mechanism risks conflating it with mental health outcomes, creating challenges for measuring the relationship between spirituality and these variables. As such, the ISS's focus on "ultimate transcendence" ensures that it remains a unique tool for assessing spirituality as a motivating influence, providing an unidimensional measure independent of emotional or psychological constructs.

Cultural relevance in the Portuguese context

Historically, Portugal has had deep Catholic roots, which have long shaped its moral and social framework. However, there has been a notable shift toward secularization in recent decades, leading to a more individualized approach to spirituality [35, 36]. This shift has significant implications for healthcare, particularly in palliative care, where addressing spiritual needs beyond organized religion is crucial for providing holistic care. Yet, this integration is often hindered by the difficulty many professionals encounter in distinguishing between spiritual and religious concerns. The ISS provides healthcare professionals with a tool that aligns with Portugal's contemporary spiritual landscape, enhancing the quality of the spiritual care provided [36–38].

The validation of the ISS enriches the repertoire of tools available for assessing spirituality in Portugal. While other validated scales have proven effective in specific healthcare contexts, their approaches differ significantly from those of the ISS. For instance, the End-of-Life Spiritual Comfort Questionnaire and the FACIT-Sp-12 (FACIT-Sp) incorporate dimensions of faith and peace, which may resonate with religious populations but risk excluding nontheistic perspectives. Similarly, the Spiritual Well-Being Questionnaire (SWBQ), while exploring spiritual well-being through a multidimensional framework, explicitly references "God" in its transcendental domain, potentially limiting its inclusivity in nontheistic populations.

In contrast, the ISS offers a focused, unidimensional approach to intrinsic spirituality, emphasizing its role as a personal motivator rather than a function of faith or religious affiliation. When compared to tools like the End-of-Life Spiritual Comfort Questionnaire, which addresses specific end-of-life scenarios, the ISS's universal framing allows it to be applied broadly, from medical education

to clinical practice. Its concise structure (six items) enhances its practicality for time-sensitive environments like palliative care. By avoiding overt religious terminology and prioritizing inclusivity, the ISS aligns with contemporary understandings of spirituality in secular and multicultural societies.

Clinical implications for palliative care

The ISS is highly relevant in palliative care settings, where spirituality often plays a central role in how patients confront the end of life. Research has demonstrated that patients with higher levels of spirituality are more likely to experience better quality of life, manage stress and anxiety effectively, and have more positive interactions with healthcare providers during palliative care [4, 7, 39].

Given the profound impact of spirituality on clinical outcomes, the ability to assess and address spiritual needs accurately is indispensable. The ISS can be seamlessly integrated into initial patient assessments and ongoing care plans, allowing clinicians to promptly identify and address spiritual needs as part of a holistic approach to symptom management. The regular utilization of the ISS in clinical practice enables the identification of patients who may benefit from spiritual counseling, chaplaincy services, or specific interventions aimed at alleviating existential distress. By integrating the ISS into clinical practice, healthcare providers can ensure that spiritual concerns are recognized and respected. This recognition fosters greater trust between patients and healthcare providers, ultimately enhancing the therapeutic relationship and supporting better adherence to medical advice [40].

Broader impact and future research

The validation of the ISS in Portugal extends its utility to other Portuguese-speaking and culturally similar regions. The scale's ability to distinguish spirituality from religiosity makes it particularly valuable in contexts where traditional religious practices are less prevalent. By providing a culturally sensitive tool, the ISS facilitates international comparative studies, allowing researchers to explore how spirituality is experienced and expressed across different cultures within the Lusophone community. Furthermore, the ISS can be utilized in public health research to examine the role of spirituality as a protective factor in mental health and its influence on treatment adherence in chronic illness management [34].

Limitations and directions for future research

Despite its strengths, this study has several limitations. The convenience sample, which was predominantly urban and academic, may not fully represent the broader diversity of spiritual experiences in Portugal. Future studies should aim to validate the ISS via more diverse and representative samples, preferably through probabilistic

sampling methods, to increase the generalizability of the findings. Additionally, it is essential to conduct further research to explore how the ISS performs in different clinical settings and among various patient populations, particularly those with chronic or terminal illnesses. Future research should explore how these findings compare to those from culturally similar European countries. Examining how intrinsic spirituality interacts with psychological constructs such as coping, resilience, and mental health outcomes could provide further knowledge into its broader implications.

Moreover, internal consistency analysis revealed correlations above the recommended level, indicating potential redundancy in the ISS scale. High Cronbach's alpha values in the Portuguese, Turkish, and Muslim versions suggest that this is a common issue across cultural adaptations. Future revisions should include qualitative studies to reduce redundancy and improve the scale's precision.

Conclusions

The translation and validation of the ISS for the Portuguese population addresses a critical gap in available tools for spiritual assessment, ensuring that spirituality is measured as a distinct construct separate from religious practices. This enables more nuanced and effective interventions that can enhance the quality of life for patients in palliative care and beyond. The findings of this study confirm the reliability and applicability of the ISS in Portugal and contribute to a broader understanding of spirituality across diverse cultural contexts. Additionally, the equivalence of this version with other ISS translations facilitates multicultural studies, enabling valuable cross-cultural comparisons.

Abbreviations

CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Confidence Interval
EAE	Escala de Avaliação da Espiritualidade
EM	Expectation–Maximization
ISS	Intrinsic Spirituality Scale
RMSEA	Root mean square error of approximation
SRMR	Standardized Root Mean Square Residual
TLI	Tucker–Lewis Index
χ^2	Chi-square test

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12904-025-01714-5>.

Supplementary Material 1

Supplementary Material 2

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Nothing to declare.

Author contributions

UD has made substantial contributions to the conception; design of the work, interpretation of data; have drafted the work and substantively revised it. MB has made substantial contributions to the conception; design of the work; have drafted the work and substantively revised it. DH has substantively revised it. FR have substantively revised it. LC has designed the work; made statistical analysis; interpretation of data; and substantively revised it. All authors read and approved the final manuscript.

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Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate

This study was submitted to the Ethics Committee of the Faculty of Medicine, University of Porto, and received approval on March 31, 2022 (46/CEFMUP/22).

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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