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ORIGINAL PAPER

Psychometric Evaluation of the Persian Version of Religious Orientation Scale in Iranian Patients with Cancer

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Abstract

This paper reports on the psychometric properties of the Religious Orientation Scale (ROS) with a sample of 311 Iranian patients who were suffering from cancer between September and December 2020. A cross-sectional study design was used, and convenience sampling was employed. Reliability was evaluated by internal consistency Cronbach's alpha, McDonald's omega, and average inter-item correlation. The exploratory factor analysis showed that the ROS had 15 items and two factors (religious identity and personal identity) that explained 43.2% of the total variance of religious orientation in Iranian patients with cancer. Construct validity was assessed by means of confirmatory factor analysis. The internal consistency and composite reliability were acceptable. The results indicate that the ROS can produce reliable and valid data on religious orientation in a sample of Iranian patient with cancer.

Keywords Religious · Reliability · Validity · Religious orientation scale · Patients with cancer · Iran

Introduction

Cancer, a common cause of death, has grown rapidly globally, accounting for an estimated 10 million deaths in 2020, whereby in every one in five people diagnosed with cancer, one in eight men and one in eleven women died due to this disease (Ferlay et al., 2020) becoming an important public health problem. An estimated 131,191 new cancer cases have occurred in Iran in 2020, with breast cancer being the most diagnosed cancer type (12.9%), followed by stomach (11.2%), colorectum

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(9.1%), and lung (8%) cancers (Ferlay et al., 2020). The cancer burden exerts enormous emotional, financial, and physical pressure not only on the individuals. It also becomes as source of stress to their families and the communities around them, especially during cancer diagnosis, treatment, and follow-up processes, resulting in reduced quality of life and health (Rabitti et al., 2020; Salehi Zahabi & Mahmoudi, 2017). In addition, this experience creates negative psychological effects which include uncertainty, fear, anguish, losses (Prado et al., 2020), and a substantial amounts of anxiety and depression (Huang et al., 2020) and high suicidal risk (Amiri & Behnezhad, 2020). On the contrary, previous studies have also shown positive experiences, such as improvement in relationships and appreciation of life (Ha & Sim, 2014; Tanyi et al., 2020) among cancer patients, leading to improved quality of life (Farahbakhshbeh et al., 2019).

Individuals with cancer may resort to religion (Karami et al., 2018) to deal with their painful experiences and symptoms, as religion can provide a source of copings during these difficult times (Gall & Bilodeau, 2020; Rabitti et al., 2020; Rana et al., 2015) which helps individuals to make sense of the purpose of life, inner peace, faith (Gall et al., 2009), and the possibility of premature death (Lieberman et al., 2012). Religion enables individuals to realize the purposefulness of the creations (Gall & Bilodeau, 2020; Karami et al., 2018; Rabitti et al., 2020) especially during hard times and may result in self-empowerment to cope with the stress until adaptation occurs (Gall & Bilodeau, 2020; Rabitti et al., 2020). Hence, promoting spiritual well-being and hope can be beneficial to sufferers from cancer (Komariah et al., 2020; Martins et al., 2020). Believing in God empowers individuals with cancer to have serenity that strengthens their relationships with families (Karami et al., 2018), improving psychosocial adaption (Paredes & Pereira, 2018; Park & Cho, 2017) and attitude toward the disease (Wang et al., 2017), thus fostering better quality of life (Salehi Zahabi & Mahmoudi, 2017).

One of the concepts associated with empowerment in individuals with cancer is ROS. An early study by Allport and Ross (1967a, b) measured religious orientation from two different aspects: intrinsic and extrinsic orientation (Allport & Ross, 1967a, b; Batson, 1976). Intrinsic religious orientation refers to individuals who truly embrace the belief and faith in their lives and live in accordance with the religious principles with distinctive purpose and meaning, whereas individuals with extrinsic religious orientation use their faith and religious beliefs to meet their personal needs and social objectives (Allport & Ross, 1967a, b). ROS developed by Allport and Ross (1967a, b) is the most fundamental and widely used scale. Over time, this religious orientation measure underwent a series of modifications forming new scales such as Religious Orientation Scale-Revised (ROS-R) by Gorsuch and McPherson (1989) and Age Universal Intrinsic/Extrinsic Scale (Gorsuch & Venable, 1983), to name a few. Kirkpatrick (1989) further improved the ROS scale by categorizing extrinsic orientation to two sub-components, personal and social extrinsic orientations, whereby they refer to the use of religion as safety, comfort or relief, and social relationships, respectively (Batson & Ventis, 1982). Subsequently, studies have found that religious orientation plays a vital role in one's mental and physical health (Ai et al., 2016; Steffen et al., 2015) and significantly predicts religious coping (Cruz-Ortega et al., 2015). In addition,

religion reduces the state of negative emotions such as anxiety, distress, hopelessness, and depression (McCoubrie & Davies, 2006) among individuals with cancer and is a powerful protector against suicide (Al-Sharifi et al., 2015; Sisask et al., 2010) and also predicts high levels of resilience to adversity (Sánchez-Teruel & Robles-Bello, 2020). Studies have found that there is a link between survivors of cancer and spiritual well-being even after the treatment has ended (Peterman et al., 2002; Sherman et al., 2015). Religion can give hope to the cancer patients and allows them to cope with the suffering from their disease. Previous studies have found that the majority of cancer survivors reported the importance of religion in coping with their disease (Canada et al., 2016; Bowie et al., 2017).

The current study evaluates the psychometric properties of the Persian version of the (P-ROS) in Iranian patients with cancer. To date, very little is known about the measurement tools used for assessing the religious orientation among these patients. Therefore, this study seeks to evaluate the reliability, validity, and factor structure of the P-ROS in Iranian patients with cancer.

Method

Design and Participants

The cross-sectional study design was used to evaluate the psychometric properties of a Persian version of the P-ROS among Iranian patients who were suffering from cancer. The inclusion criteria of this study were: having a diagnoses of cancer, being 18 years old or older, willingness to participate at the study, and speaking Persian. The survey was conducted in Iran between September and December 2020. A convenience sampling method was used. A total of 311 patients were enrolled in this study. The sample size was determined based on formulas for structural equation models, with an effect size = 0.18, statistical power level = 0.8, number of latent variables = 2, number of observed variables = 20, and p-value = 0.05.

Measures

The first part of the questionnaire asked participants to report their basic demographic characterizes, such as gender, age, marital status, employment status, current economic condition, and education level. Patients were also asked to state the type of cancer, and duration since cancer diagnosis. In the second section, the 20 items ROS that were developed by Allport and Ross (1967a, b) were used to measure the patients' religious orientation. Patients were asked to indicate whether they agree with each statement (e.g., "I try to carry my religion over into my") using a five-point Likert scale ranging from 1-(strongly disagree) to 5-(strongly agree). In accord with the scoring procedure, three items were coded reversely (e.g., "It does not matter so much what I believe so long as I lead a moral life").

Procedure

A forward–backward translation technique reported by Beaton et al., (2000) was used. Two English–Persian translators were asked to independently translate the ROS from English to Persian. The two independently translated the P-ROS; these translations were then reviewed and evaluated by a group of experts, including some authors of this article (H.SH and D.K) as well as two professional translators, to construct a single P-ROS. Subsequently, the single P-ROS was back-translated to English by a Persian–English translator and confirmed by the experts on the correctness of the translation.

Content Validity

To ensure the validity of the content, the P-ROS was assessed both qualitatively and quantitatively. For qualitative assessment, the questionnaire was given to 10 experts in the field of health and psychology to obtain their feedback and comments on the accuracy of the wording, item allocation, and representativeness of the items. The quantitative assessment was achieved by the use of content validity ratio (CVR) and modified kappa coefficient (K) to make sure the instrument was fully assessed or measured the construct of interest. To compute CVR and K, this study asked the above-mentioned 10 experts to rate the necessity of the ROS items using: not essential, useful but not essential, and essential. Then, based on the formula of $(Ne - (N/2))/(N/2)$, the CVR was calculated (Ne is the number of experts who rate the items as "Necessary," and N is the total number of the experts) (Cook & Beckman, 2006). In this case, when the number of experts is 10, the value of more than 0.62 for CVR was considered acceptable (Lawshe, 1975). Thereafter, the K of each item was calculated to evaluate item relevancy (relevant = 4, irrelevant = 1) based on the rating given by the 10 experts, and values greater than 0.78 are acceptable (Polit & Yang, 2016).

Construct Validity and Reliability

The construct validity on the psychometric evaluation of the P-ROS was assessed by conducting both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) using $SPSS_{26}$ and $AMOS_{26}$, respectively. Specifically, construct validity was evaluated through convergent validity and discriminant validity. To do so, this study randomly separated the dataset into two. The first dataset ($n = 156$) was used for EFA, and second dataset ($n = 155$) was used for CFA. This study applied maximum likelihood EFA with Promax rotation, and the Kaiser–Meyer–Olkin (KMO) and Bartlett's test of sphericity was employed to check the relevance and suitability of the sample for CFA. The factor structure was extracted based on (1) eigenvalues greater than 1; (2) commonalities of greater than 0.2; and (3) scree plots. Once the factor structure formed from EFA, then the maximum likelihood CFA was performed to confirm and validate the factor structure obtained from the results of EFA.

The model fit was evaluated according to several fitness indexes, such as Chi-square (χ^2) test, Chi-square (χ^2)/degree of freedom (df) ratio less than 5, goodness-of-fit index (GFI), comparative fit index (CFI), normed fit index (NFI), incremental fit index (IFI), and Tucker–Lewis index (TLI), more than 0.9, standardized root-mean-square residual (SRMR) less than 0.09, and root means the square error of approximation (RMSEA) less than 0.08 (Pahlevan Sharif & Sharif Nia, 2021; She et al., 2021). Convergent validity was evaluated through construct composite reliability (CR) > 0.7, and average variance extracted (AVE) > 0.5 and less than its respective CR (Hair et al., 2010; Rahmatpour et al., 2020). For discriminant validity, this study used both Fornell and Larcker and heterotrait–monotrait ratio of correlations (HTMT) criterion, where the square root of each construct's AVE should be higher than its correlation with other constructs (Fornell & Larcker, 1981), and all values in the HTMT matrix table should be less than 0.85 (Henseler et al., 2015).

Reliability

Factor's internal consistency was evaluated using Cronbach's alpha and McDonald's omega of more than 0.7 (Rahmatpour et al., 2020). Moreover, CR and maximum reliability (MaxR) were used to assess the construct reliability in the measurement model, and generally, the minimum value of 0.7 is considered acceptable (Hair et al., 2014). To evaluate the test–retest stability of the ROS over an interval of two weeks using two-way mixed intra-class correlation coefficient (ICC) for absolute agreement, the ICC more than 0.8 was considered as almost perfect.

Multivariate Normality and Outliers

This study assessed the normality of the data through both univariate and multivariate normality. The normality of the univariate distributions was examined for outliers that fall outside the expected population, and the skewness and kurtosis of the data. Where the normality of the multivariate distributions was evaluated using Mardia's coefficient of multivariate kurtosis, Mardia's coefficient of more than 7.98 reveals deviation of multivariate normality (Arbuckle & Wothke, 1999; Gao et al., 2008). The multivariate outliers are assessed by their Mahalanobis distances ($p < 0.001$), which represent the squared distance (Tabachnick et al., 2007).

Ethical Considerations

This study was approved by the Ethics Committee of Mazandaran University of Medical Sciences, north of Iran (Approval Code: IR.MAZUMS.REC.1400.10523). We followed ethical principles in this study, including: informing the participants about the goals and process of the study, reporting the results while maintaining the patient's independence, advising the participants that their participating is voluntary, and obtaining written informed consent from all participants.

Results

The sample of this study consisted of 152 males (48.9%) and 159 females (51.1%). The mean age of the patient was 52.8 years (SD = 22.0), and the majority of the patients were married (78.1%). Their economic status was reported by 90% of the patients as moderate and weak. Most of the patients (34.4%) in the study had gastrointestinal cancer. Most of the patients (57.8%) reported that they do not know the stage of their cancer. On average, the patients had been diagnosed and experienced treatment with cancer for 20.2 months (SD = 26.8). The characteristics profile of the patients is presented in Table 1.

CVR and K were used to evaluate the content validity of the P-ROS. Based on the feedback from 10 experts, the CVR for the 20-item ROS was greater than 0.62 (Lawshe, 1975). Furthermore, the results of the K for all items of the ROS were greater than 0.6. Thus, all items were considered appropriate at this stage. Table 2 shows the distribution properties of the ROS's items.

Table 3 shows the results of the maximum likelihood EFA with Promax rotation on the P-ROS ($n = 156$). The results of the KMO (0.908) and the Bartlett's test of sphericity ($p < 0.001$, $\chi^2 = 1819.57$, df = 105) indicate an adequate and appropriate sampling for factor analysis. There were two factors extracted while conducting the EFA, and these two factors consisted of 15 items [religious identity (Factor 1): 12 items; personal identity (Factor 2): 3 items] explaining 43.202% of the total variance. Five items (2, 16, 18, 19, and 20) were excluded due to the low communalities of less than 0.2.

Next, the maximum likelihood CFA ($n = 155$) was conducted to confirm and validate the factor structure extracted from EFA (Fig. 1). The results of CFA showed that the model fit of two-factor measurement model was good as indicated by χ^2 (89) = 196.46, $p < 0.001$, χ^2/df = 2.21, GFI = 0.92, CFI = 0.94, NFI = 0.90, IFI = 0.94, TLI = 0.93, SRMR = 0.05, RMSEA (90% CI) = 0.06 [CI: 0.05 to 0.07].

The convergent validity of each factor was accessed using CR and AVE. The results showed that AVE and CR for religious identity were 0.44 and 0.90, respectively. AVE and CR for personal identity were 0.39 and 0.65, respectively. Although the AVE for both factors was less than 0.5, Fornell and Larcker (1981) recommended that if AVE is less than 0.5, CR is greater than 0.6 for psychological construct, and the convergent validity of the construct can be established. Indeed, AVE is a strict measure of convergent validity and a more conservative measure than composite reliability. Hence, on the basis of CR, convergent validity for both constructs was achieved. The discriminant validity was assessed using both Fornell and Larcker and HTMT criteria. The results showed that the square root of AVE (religious identity: 0.66; personal identity: 0.63) for each factor was higher than its correlation with other factors, where the correlation between religious identity and personal identity was 0.04. Also, the value between religious identity and personal identity in the HTMT matrix (0.03) was less than 0.85, indicating discriminant validity of both factors was established in this study.

The internal consistency and construct reliability were assessed through Cronbach's alpha, McDonald's omega, CR, and Max R. The results showed that Cronbach's alpha and McDonald's omega for religious identity were 0.89 (95% CI.: 0.88

Table 1 Characteristic profiles of the respondents in Iranian cancer patients ($n = 311$)

Characteristic	*n* (%)	Characteristic	*n* (%)
Gender		*Employment Status*	
Male	152 (48.9)	Housekeeper	129 (41.5)
Female	159 (51.1)	Employed	23 (7.5)
Marital status		Freelance	76 (24.4)
Single	38 (12.2)	Retired	63 (20.2)
Married	242 (78.1)	Others	20 (6.4)
Divorced	13 (3.9)	*Type of cancer treatment*	
Widow	18 (5.8)	Chemotherapy	199 (64)
Education level		Radiotherapy	4 (1.3)
Illiterate	11 (3.5)	Surgery	6 (1.9)
Elementary	91 (29.3)	Chemotherapy and radiotherapy	33 (10.6)
Post elementary	48 (15.4)	Chemotherapy and surgery	41 (13.2)
High school	24 (7.7)	Surgery and radiotherapy	4 (1.3)
Diploma/post diploma	95 (30.5)	All of the first three	14 (4.5)
Undergraduate	31 (10.0)	Refuse to answer	10 (3.2)
Postgraduate	11 (3.5)	Stage of the cancer	
Economic status		Stage 1	29 (9.3)
Weak	103 (33.1)	Stage 2	42 (13.5)
Moderate	177 (56.9)	Stage 3	28 (9.0)
Good	26 (8.4)	Stage 4	32 (10.3)
Very good	5 (1.6)	Do not know	180 (57.8)
		Type of cancer	
		Brest	48 (15.4)
		Lung	21 (6.7)
		Blood	24 (7.8)
		Gastrointestinal tract	104 (34.4)
		Lymphatic	56 (17)
		Urinary tract	13 (4.2)
		Pancreas	13 (4.2)
		Brain	9 (2.9)
		Bone marrow	23 (7.4)
Living area		*Characteristic*	*Mean (SD)*
City	287 (92.2)	Age	52.8 (22.0)
Village	24 (7.8)	Diagnosed with cancer (month)	20.2 (26.8)

to 0.91) and 0.90 (95% CI.: 0.86 to 0.91), respectively, indicating good internal consistency. Also, the results of CR (0.90) and MaxR (0.92) for religious identity were greater than 0.7, indicating good construct reliability. On the other hand, Cronbach's alpha, McDonald's omega, CR, and MaxR for personal identity were 0.63 (95% CI: 0.55 to 0.69), 0.65 (95% CI: 0.64 to 0.64), 0.65, and 0.66, respectively. Although the Cronbach's alpha, McDonald's omega, CR, and MaxR for personal identity were

Table 2 Distribution properties of ROS's items in Iranian cancer patients

Item	*N*	*M*	*SD*	Min	Max	Skewness	Kurtosis
ROS1	311	4.05	1.04	1	5	− 1.19	0.99
ROS2	311	2.57	1.35	1	5	0.52	− 0.98
ROS3	311	4.54	0.79	1	5	− 2.45	7.28
ROS4	311	3.81	0.96	1	5	− 0.88	0.99
ROS5	311	4.08	1.03	1	5	− 1.19	1.03
ROS6	311	3.61	1.26	1	5	− 0.64	− 0.69
ROS7	311	3.68	1.22	1	5	− 0.70	− 0.49
ROS8	311	3.63	1.26	1	5	− 0.68	− 0.57
ROS9	311	3.34	1.15	1	5	− 0.41	− 0.62
ROS10	311	3.06	1.18	1	5	− 0.15	− 0.96
ROS11	311	3.71	1.21	1	5	− 0.77	− 0.31
ROS12	311	3.73	1.12	1	5	− 0.80	− 0.13
ROS13	311	3.64	1.11	1	5	− 0.82	0.11
ROS14	311	3.67	1.12	1	5	− 0.69	− 0.42
ROS15	311	3.32	1.12	1	5	− 0.39	− 0.49
ROS16	311	2.51	1.32	1	5	0.51	− 0.99
ROS17	311	3.59	1.05	1	5	− 0.73	0.06
ROS18	311	2.99	1.28	1	5	− 0.10	− 1.17
ROS19	311	2.43	1.14	1	5	0.44	− 0.68
ROS20	311	3.41	1.28	1	5	− 0.54	− 0.89

less than 0.7 but greater than 0.6, it was acceptable for internal consistency and construct reliability in psychology. The reason for lower Cronbach's alpha, McDonald's omega, CR, and MaxR for personal identity could be due to fewer item of this factor. Moreover, the average measures of ICC showed that stability of ROS was evaluated as almost perfect (ICC = 0.92, 95% CI: 0.82 to 0.96).

Discussion

The results of this study support a valid and reliably revised version of the ROS with 15 items and two factors that explained 43.2% of the total variance of religious orientation in Iranian patients with cancer. Also, the results of CFA confirmed the model goodness of fit. Although the initial psychometric studies have determined a three-factor structure of the intrinsic/extrinsic and quest ROS is valid (Brewczynski & MacDonald, 2006a, b; Genia, 1993; Gorsuch & McPherson, 1989; Kirkpatrick, 1989), some of the other psychometric evaluations showed different results. Brewczynski and MacDonald (2006a, b) acknowledged that the extrinsic ROS items have the potential to be categorized as two factors when CFA has been conducted separately for this domain (Brewczynski & MacDonald, 2006a, b). Kamaluddin et al. (2017) reported a revised version of ROS consisting of 14 items with three factors titled intrinsic orientation, extrinsic-socially orientation, and extrinsic-personally orientation (Kamaluddin et al., 2017). Overall, the existing knowledge regarding the

Table 3 The result of EFA on the two-factor Persian version of ROS scale in Iranian cancer patients ($n = 156$)

Factor	Items	Factor loading	h^2	⍾	Variance
Religious Identity	5. My religious beliefs are what really lie behind my whole approach to life	0.82	0.68	5.33	35.55%
	4. One reason for my being a congregation member is that such membership helps to establish a person in the community	0.77	0.60		
	1. I try hard to carry my religion over into all my other dealings in life	0.77	0.60		
	13. Religion is especially important to me because it answers many questions about the meaning of life	0.74	0.56		
	6. The purpose of prayer is to secure a happy and peaceful life	0.70	0.49		
	12. My house of worship is most important as a place to formulate good social relations	0.67	0.45		
	17. It is important to me to spend periods of time in private religious thought and meditation	0.59	0.36		
	3. Quite often I have been keenly aware of the presence of God or the Divine Being	0.59	0.39		
	9. If not prevented by unavoidable circumstances, I attend my house of worship	0.56	0.32		
	7. The prayers I say when I am alone Carry as much meaning and personal emotions as those said by me during services	0.56	0.33		
	11. If I were to join a religious group, I would prefer to join (1) a Bible study group or (2) a social fellowship (circle the appropriate choice and respond accordingly)	0.56	0.31		
	15. I read literature about my faith	0.51	0.28		
Personal Identity	10. Although I am a religious person, I refuse to let religious considerations influence my everyday affairs	0.70	0.50	1.14	7.64%
	14. Although I believe in my religion, I feel there are many more important things in life	0.62	0.39		
	8. It doesn't matter so much what I believe so long as lead a moral life	0.51	0.27		

h^2 Communalities, ⍾ Eigenvalues

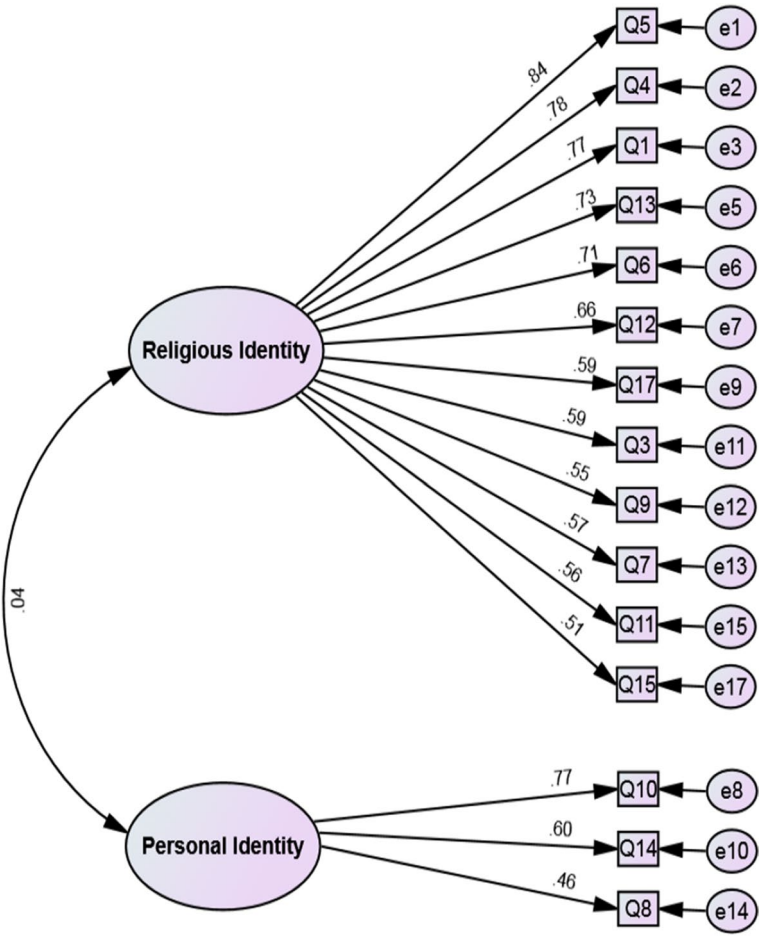

Fig. 1 Model of confirmatory factor analysis of ROS in Iranian cancer patients ($n = 155$)

ROS psychometric evaluations has demonstrated the complexity of factorial structure of this scale (Brewczynski & MacDonald, 2006a, b).

In this study, five items (items two, 16, 18, 19, and 20) were removed from the scale based on CFA results. However, the original ROS had 20 items in which the intrinsic scale had 9 items, while the extrinsic scale had 11 items (Allport & Ross, 1967a, b). All of the excluded items in the current psychometric evaluation were from the extrinsic scale. Closer examination of the pattern of findings obtained from some Iranian studies revealed the significant importance of intrinsic religious orientation in the face of challenges and adversities. In comparison with the extrinsic religious orientation, it has been indicated that intrinsic religious orientation has the highest positive correlation with post-traumatic growth (Seidmahmoodi et al., 2011) and predicts better adjustment to adversities (Ghorbani et al., 2002). These findings may contribute to a more nuanced understanding of

why some extrinsic scale items were removed. Beyond the intrinsic and extrinsic orientation, Iranian muslims perceived their religion as inspirational, humanitarian, and sacrificial (Khodadady & Bagheri, 2012).

The high level of CR, Cronbach's alpha, McDonald's omega, and the correlation between the items demonstrated that the revised two factors of the scale had acceptable internal consistency and reliability. The current findings are in accordance with the earlier studies. The Allport and Ross's (1967a, b) version of the religious orientation scale had a reliability of 0.79. The Genia's revised version of the orientation scale also demonstrated an increased reliability (0.86) when applied to people of non-Christian faiths (Genia, 1993).

The AVE and CR findings of the current study indicated that the short 15-item two-factor Persian version of the P-ROS has adequate convergent validity. This suggests that a higher religious orientation is associated with the more positive attitudes toward the meaning of life in intrinsic and extrinsic domains. The literature suggests that spiritual practices such as reflection, going beyond oneself to reach a higher power, and one's relationship with God may provide effective coping strategies that may help the individual find meaning and purpose in stressful situations. It may also result in self-empowerment to cope with the stressor until adaptation occurs (Baldacchino & Draper, 2001; Gall & Bilodeau, 2020; Rabitti et al., 2020). In the case of patients with cancer, studies have indicated that meaning, peace, and faith promote the spiritual well-being (Rabitti et al., 2020), whereas some patients may experience an emotional and spiritual struggle in their adaptation process (Gall & Bilodeau, 2020). A qualitative study in Iranian patients with cancer found that participants may be questioning the spiritual values and loss, or question their faith. They may experience a lack of intimacy with God or question Gods justice (Ghaempanah et al., 2020). Despite such findings, many studies have been conducted among Iranian patients with chronic disease and have found that a positive role of religion was supportive of their care. In this regard, implementing religious psychotherapy has been found to be an effective intervention to improve mental health and reduce pain in cancer patients (Eilami et al., 2019). Considering the positive significant correlation between self-care and positive religious coping in a sample of Iranian cancer patients (Goudarzian et al., 2019) suggests an improvement in the level of positive religious affiliation that can have a beneficial effect on the self-care of cancer patients. Similarly, the studies conducted with a sample of Iranian patients with heart failure (Kazeminezhad et al., 2020), and diabetic patients (Heidari et al., 2017) have also shown the benefits of religious practice in improving patients' health.

In addition to the five dropped items, the current study findings demonstrated the item shift between intrinsic and extrinsic domains after EFA. Considering the spiritual orientation as a dichotomous format has several conceptual difficulties. The aforementioned concerns lead to the suggestion that religious orientation has a continuous nature rather than a bipolar concept (intrinsic and extrinsic), because dichotomizing religious orientation precludes the possibility of assessing curvilinear relationships between intrinsic and extrinsic religious orientation and other variables (Jong et al., 2018; Kirkpatrick & Hood, 1990).

Study Limitations

This study has some limitations. A convenience sampling method was used to obtain the sample; thus, the results cannot be generalized to all cancer patients in Iran. Also, further studies with different types of clinical sub-groups (e.g., newly diagnosed cancer patients and cancer survivors) are needed to cross-validate the current study findings. Furthermore, the current study findings indicated that the two-factor model of Persian ROS explains 43.2% of the total variance. Considering that the religious orientation is a culture-sensitive construct (Allport & Ross, 1967a, b; Forouhari et al., 2019; Glenn et al., 1987), and different findings regarding the psychometric evaluation of the ROS across various settings (Allport & Ross, 1967a, b; Brewczynski & MacDonald, 2006a, b), more psychometric evaluation among the study sample is needed.

Conclusion

In conclusion, the present study provides evidence of scale construct validity and reliability of the P-ROS version in Iranian patients with cancer. The study was conducted in response to the lack of specific measurement tools for assessment of religious orientation among patient with cancer in Iran. The instrument will have applications to patients with cancer and religious research, and educational settings, and could facilitate the development and evaluation of intervention programs to improve the quality of life in patients with cancer. Further studies are needed to develop the clinical applicability of the ROS.

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Authors' Contribution The authors confirm contribution to the paper as follows: Hamid Sharif Nia and Fatemeh Khoshnavay Fomani contributed to study conception and design, Daniyal Kohestani was involved in data collection, Long She and Hamid Sharif Nia contributed to analysis and interpretation of results, Fatemeh Khoshnavay Fomani, Long She, Harpaljit Kaur, David Sánchez-Teruel, Daniyal Kohestani, and Erika Sivarajan Froelicher were involved in draft manuscript preparation, and Erika Sivarajan Froelicher contributed to edition. All authors reviewed the results and approved the final version of the manuscript.

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Declarations

Conflict of Interest There are no conflicts of interest by any of the authors of this study. All authors have participated in (a) conception and design or analysis and interpretation of the data; (b) drafting the article or revising it critically for important intellectual content; and (c) approval of the final version. This manuscript has not been submitted to, nor is under review at, another journal or other publishing venue. The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript. All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1964 and its later amendments. Informed consent was obtained from all patients for being included in the study.

Ethical Approval The current study was approved by the Ethics Committee of Mazandaran province, north of Iran, (Code: IR.MAZUMS.REC.1400.10523). We also followed ethical principles in this study, including: informing the participants about the goals and process of the study, reporting the results while maintaining the patient's independence, informing the participation about the voluntary of participating in the study, and getting informed consent to participate in the study from all participants.

Consent to Participate Informed consent was obtained from all individual participants included in the study.

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