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Validity and reliability of the persian version of templer death anxiety scale in family caregivers of cancer patients

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ABSTRACT

Background: Due to increasing recognition of the importance of death anxiety for understanding human nature, it is important that researchers who investigate death anxiety have reliable and valid methodology to measure. The purpose of this study was to evaluate the validity and reliability of the Persian version of Templer Death Anxiety Scale (TDAS) in family caregivers of cancer patients.

Materials and Methods: A sample of 326 caregivers of cancer patients completed a 15-item questionnaire. Principal components analysis (PCA) followed by a varimax rotation was used to assess factor structure of the DAS. The construct validity of the scale was assessed using exploratory and confirmatory factor analyses. Convergent and discriminant validity were also examined. Reliability was assessed with Cronbach's alpha coefficients and construction reliability.

Results: Based on the results of the PCA and consideration of the meaning of our items, a three-factor solution, explaining 60.38% of the variance, was identified. A confirmatory factor analysis (CFA) then supported the adequacy of the three-domain structure of the DAS. Goodness-of-fit indices showed an acceptable fit overall with the full model $\{\chi^2(df) = 262.32(61), \chi^2/df = 2.04$ [adjusted goodness of fit index (AGFI) = 0.922, parsimonious comparative fit index (PCFI) = 0.703, normed fit Index (NFI) = 0.912, CMIN/DF = 2.048, root mean square error of approximation (RMSEA) = 0.055]}. Convergent and discriminant validity were shown with construct fulfilled. The Cronbach's alpha and construct reliability were greater than 0.70.

Conclusions: The findings show that the Persian version of the TDAS has a three-factor structure and acceptable validity and reliability.

Key words: Cancer, caregiver, death anxiety, reliability, validity

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Submitted: 02-Jun-15; Accepted: 06-Jan-16

INTRODUCTION

Consciously and unconsciously, the idea of death can be experienced as a psychological threat. The intensity and frequency of these experiences vary as a function of personal experience, individual characteristics, and contextual/cultural factors.^[1] Just as the meaning of life for individuals derives from social interactions, the meaning ascribed to death and the degree of anxiety about death is affected by social experience and it can influence how a person conceives of and experiences

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How to cite: Soleimani MA, Bahrami N, Yaghoobzadeh A, Banihashemi H, Sharif Nia H, Haghdoost AA. Validity and reliability of the persian version of templer death anxiety scale in family caregivers of cancer patients. *Iranian J Nursing Midwifery Res* 2016;21:284-90.

Access this article online

Quick Response Code:



Website:
www.ijnmjjournal.net

DOI:
10.4103/1735-9066.180390

life. The constant fear and morbid anticipation of death and the process of dying can be experienced as a crisis that can severely interfere with the efforts made to maintain the quality of life as one approaches death. In this way, death anxiety (DA) can lead to fear of isolation and loneliness in life.^[2] Threatening diagnoses, such as cancer, can precipitate a deep crisis in the daily life of patients and their families.^[3] DA has become an important concept in various fields such as cancer treatment and palliative care.^[4] Due to its importance as a critical concept in health care delivery, DA is considered as a nursing diagnosis in North American Nursing Diagnosis Association (NANDA) criteria.^[5]

Currently, many researchers want to study about DA.^[6] Although the fear of death and dying may be a general experience, people express different reactions to it.^[7] Individual differences in DA are likely to result from several factors such as age, physical and mental disorders, spirituality and religion, and death experience, and the care of people at risk of dying can affect the level of DA.^[8] Patients with malignant diseases such as cancer are considered as vulnerable population. In most cases, attention of the medical teams is focused on stabilizing the physical symptoms. As the disease and its symptoms progress, patients fear of pain, suffering, loneliness, punishment, and loss of control. These experiences are the key features of DA.^[9]

It is essential that researchers working in the area of DA use a valid and reliable method to measure the phenomenon of DA in different populations.^[10] DA is a complex construct. It has been represented as having four dimensions including fear of rotting and decay of the body, fear of dying young, fear of loss, fear of pain, fear of loneliness, and fear of the hereafter.^[8] Each dimension is believed to have negative effects on the physical and mental health and can become a crisis in life.^[10] DA is a self-reported phenomenon which is examined in most studies. So, it is essential to use a valid and reliable instrument in order to measure it.^[8]

Existing DA questionnaires have a unidimensional or a multidimensional structure.^[11] The most widely used common scale in the area of DA was the one developed by Templer 5 years ago.^[12] Templer's Death Anxiety Scale (DAS) is a multidimensional measure of DA.^[8,13] The DAS was validated in different groups, including veterans, and has been used in studies of cancer patients.^[1,8,14,15] In so far as DA may be influenced by social and cultural factors, measures of DA need to be applicable and usable in different groups, especially those who are most likely to be in life-threatening situations.^[8] Accordingly, the goal of this study was to assess the psychometric properties of a

Persian version of Templer DAS (TDAS) in family caregivers of cancer patients.

MATERIALS AND METHODS

A demographic questionnaire, including items on caregivers' age, gender, employment, and marriage, educational and socioeconomic status of caregivers, cancer stage, and type of treatment of patients, and the TDAS were administered to the participants. Written permission for using the TDAS had been obtained from the developer of the scale. A forward-backward translation technique was used to translate the scale from English into Persian. Specifically, two English-Persian translators were invited to independently translate the TDAS. An expert panel consisting of the authors of this paper and the two translators assessed and unified the two translations and produced a single Persian translation of TDAS. Following this, a Persian-English translator was asked to back-translate the Persian TDAS into English. This English version of the TDAS was sent to Dr. Templer. He confirmed the correctness of translations and confirmed the similarity of our English TDAS to the original English TDAS.

The TDAS includes 15 items which are scored on a five-point Likert scale from 1 (completely disagree) to 5 (completely agree). These items are shown in Appendix 1. The total score of the scale ranges from 15 to 75. Lower scores indicate lower levels of DA. Items 2, 3, 5, 6, 7, and 15 are scored in reverse.^[16]

Construct validity assessment

To assess construct validity, the factor structure of the Persian TDAS was examined by conducting an exploratory factor analysis (EFA) by performing a principal components analysis followed by a varimax rotation with SPSS 22 (SPSS Inc., Chicago, IL, USA). The study population consisted of all caregivers of patients who had been referred to Velayat Hospital located in Qazvin, Iran, between September and December 2012, for cancer treatments such as surgical resection, radiotherapy, and chemotherapy. The patients' inclusion criteria were: Age 21 years or older, having received a definitive diagnosis of cancer during the year preceding the study, being eligible for undergoing surgery, radiotherapy, or chemotherapy, being able to read and write Persian, and having no physical or psychiatric problems – other than cancer – which could restrict participation in the study (such as schizophrenia, post-traumatic stress disorder, dementia, major depressive disorder). The minimum sample size for conducting the factor analysis is equal to 5–10 times more than the number of the items of the intended instrument.^[17] A sample size of 326 caregivers provided a more-than-adequate participant/item ratio. Caregivers were asked to complete the Persian TDAS. The

Kaiser–Meyer–Olkin (KMO) test and the Bartlett’s test of sphericity were used to check the appropriateness of the study sample and the factor analysis model. The number of factors was determined based on eigenvalues and scree plot. Items with absolute loading values of 0.3 or greater were regarded as appropriate.^[13]

The factor structure obtained from the EFA was then examined by using a confirmatory factor analysis (CFA) conducted with AMOS 19. Jaccard and Wan (1996) have recommended that most common indexes of goodness of a fitting model in CFA are χ^2 goodness-of-fit index (CMIN), root mean square error of approximation (RMSEA), normed fit Index (NFI), adjusted goodness of fit index (AGFI), parsimonious comparative fit index (PCFI), and Chi-square divided by df value (CMIN/DF).^[18] Cut-off criteria of model fit indices for latent variable models are given in Table 1.^[19-21]

Convergent and discriminant validity were assessed by estimating average variance extracted (AVE), maximum shared squared variance (MSV), and average shared square variance (ASV). To establish convergent validity, the AVE of constructs should exceed 0.50. For discriminant validity, both MSV and ASV should be less than AVE.^[22]

Reliability assessment

The reliability of the Persian TDAS was first assessed through evaluating its internal consistency and calculating Cronbach’s alpha. Alpha values of 0.7 or greater show satisfactory internal consistency.^[23] Then, the construct reliability (CR) of each of the factors was assessed.^[24] CR of the model was determined, whereby values between 0.6 and 0.7 can be accepted provided other indicators are good.^[25]

Ethical considerations

The study was approved by the Ethics Committee of Qazvin University of Medical Sciences, Qazvin, Iran. Caregivers were informed about the study aims and procedures. Moreover, they were ensured that participation was voluntary and that it would not affect the course of their treatments. The confidentiality of caregivers’ information

was guaranteed. Informed consent was obtained from all participants.

RESULTS

The average age of caregivers [$N = 326$, including 195 females (60%)] was 39.8 (SD: 13.6, 95% CI: 38.3–41.3). The majority of caregivers were married (77.3%) and unemployed (65.3%). Also, most of the participants (32.2%) had a high school education.

The reliability of TDAS for men and women was 0.78 and 0.81, respectively. On the other hand, the reliability of negative questions was calculated to be 0.45 and 0.38 for men and women, respectively. The mean score of DA among women was 49.52 (SD: 9.02, 95% CI: 48.25–50.80) and for men, it was 42.82 (SD: 8.55, 95% CI: 41.34–44.30) ($P < 0.001$).

The KMO was 0.86, and the Bartlett’s test of sphericity was significant ($P < 0.001$), demonstrating that the sampling was adequate. Principal factor analysis with varimax rotation was conducted to assess the underlying structure for the 15 items of the TDAS. The varimax rotation indicated the following: (a) Five items loaded on the first factor which explained 21.73% of the rotation variance; (b) four items loaded on the second factor with 20.45% of rotation variance; (c) and four items loaded on the third factor with 18.20% of rotation variance. The total cumulative variance explained by these three factors was 60.38%. Table 2 displays the items and factor loadings for the rotated factors, with loadings less than 0.50 omitted to improve clarity.

Next, the factor structure obtained with EFA was assessed with a CFA. The fit of the final CFA was acceptable [$\chi^2 (61, N = 326) = 262.32, P < 0.001$; AGFI = 0.922, PCFI = 0.703, NFI = 0.912, CMIN/DF = 2.048, RMSEA = 0.055]. According to the final model for the TDAS construction [Figure 1], there was a correlation between the 9th and 11th items (between e6 and e7).

The CR of all F1 (0.81), F2 (0.79), and F3 (0.77) was greater than 0.70, which indicates good reliability. As shown in Table 3, the AVE, MSV, and ASV of constructs fulfill the requirements of convergent and discriminant validity.

DISCUSSION

This study aimed to evaluate the validity and reliability of the Persian version of TDAS in family caregivers of cancer patients. The findings of this study indicate that DAS is a multidimensional scale. The results of data analysis showed that while internal consistency was achieved with the

Table 1: Cut-off criteria for several fit indexes

Indexes	Acceptable fit
Chi-squared P value	>0.05
PCFI	>0.5
PNFI	>0.5
AGFI	>0.8
RMSEA	Good <0.08, moderate <0.08-0.1
CMIN/DF	Good <3, acceptable <5

AGFI: Adjusted goodness of fit index, CMIN: Minimum discrepancy function, DF: Degrees of freedom, PCFI: Parsimony normed comparative fit index, PNFI: Parsimonious normed fit index, RMSEA: Root mean square error of approximation

Table 2: Exploratory factor loading of items in the DAS with three factors

Factor	Items	Loading	% of variance	Eigen values
1	It doesn't make me nervous when people talk about death	0.786	21.73	5.51
	I am very much afraid to die	0.779		
	I am not at all afraid to die	0.763		
	I dread to think about having to have an operation	0.650		
	The thought of death never bothers me	0.696		
2	I fear dying a painful death	0.786	20.45	1.84
	I am really scared of having a heart attack	0.775		
	I feel that the future holds nothing for me to fear	0.600		
	The sight of a dead body is horrifying to me	0.550		
3	I am often distressed by the way time flies so very rapidly	0.748	18.20	1.09
	I often think about how short life really is	0.739		
	The subject of life after death troubles me greatly	0.623		
	I shudder when I hear people talking about a World War III	0.541		

Table 3: Convergent and divergent validity of TDAS

Factor	AVE	MSV	ASV
1	0.53	0.37	0.24
2	0.57	0.42	0.25
3	0.59	0.34	0.21

TDAS: Templer death anxiety scale, AVE: Average variance extracted, MSV: Maximum shared squared variance, ASV: Average shared square variance

minimum value of alpha, intra-class correlation coefficient was satisfactory. Sharif Nia *et al.* (2014) reported that the internal consistency and intra-class correlation index using Death Anxiety Scale-Extended among veterans were 0.89 and 0.91, respectively.^[8] Reliability of the DAS in the study of Kelly and Corriveau (1995) was 0.73.^[26] In another study, reliability of this scale tested by “split-half” technique was 0.57.^[27] Templer’s search results show that correlation coefficients of test-retest and internal consistency using Kuder–Richardson equation 20 were 0.83 and 0.76, respectively.^[16] Although the Cronbach’s alpha coefficient is enhanced by a large number of items, the high Cronbach’s alpha coefficient observed for the entire measure cannot be interpreted as indicating a unidimensional measure.^[8] Results show that DA is different among men and women. It represents that women had higher level of DA than men. It seems that gender is one of the factors affecting DA. Studies indicate that older women experience DA more than older men.^[28,29] However, some studies argue that there is no

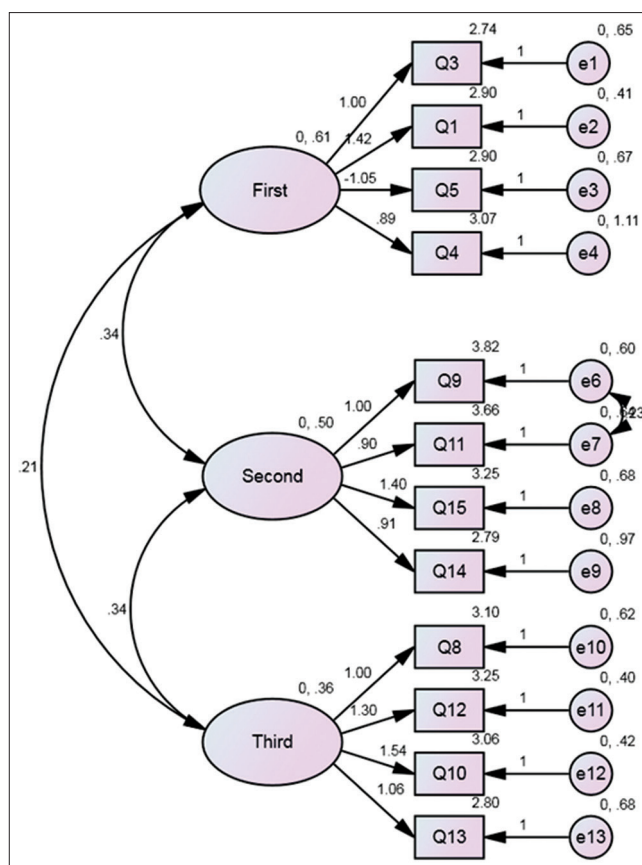


Figure 1: Final model of factor structure of TDAS in family caregivers of cancer patients

relationship between DA and gender. For example, there was no significant difference between the mean scores of DA in men and women who were in charge of organizing the funeral.^[3] In fact, there may be no differences in DA between men and women and it could be due to the cultural patterns that allow women to express their feeling of anxiety more freely.^[30] However, men tend to show themselves as more resistant and show their anxiety less.^[27]

The results of principal component EFA with varimax rotation showed that the Persian TDAS had a three-factor structure which explained 60.38% of the total variance. These three factors had an eigenvalue of greater than 1. The highest factor loadings were observed with the first factor.^[5,31] The observed factors appeared to represent three latent constructs: Fear to face death, bodily preoccupation with death, and fear of loss of life, respectively. So, TDAS is a multidimensional scale in this group of people. In contrast, four factors were extracted from the scale in Thorson and Powell’s (1992) study, including fear of loneliness, fear of pain, fear of the end of life, and the fear of being buried and rotting bodies.^[32] Other similar studies in different populations showed that the scale has five,^[33,34] four,^[8,35] and even three^[13] latent factors. Sherman *et al.* (2010) aimed to compare DA and quality of life among

cancer patients, AIDS patients, and their family caregivers. The researchers showed that DA of patients with AIDS was higher than patients with advanced cancer, and no significant differences were observed between the two groups of caregivers. Moreover, both groups of patients experienced more DA than their family caregivers.^[5]

Although many studies used EFA for validating TDAS, this study validated this scale by the use of CFA. CFA can evaluate goodness of fit results of factor structure of a scale, which can provide more precise and conclusive evaluation of latent factors. In the present study, data analysis confirmed that the final model was a good fit. Thorson and Powell (1992) confirmed four factors using CFA.^[32] The final model of TDAS of the present study represents that there is correlation between measurement errors of items 9 and 11. Munro (2005) states that correlated measurement error occurs in the situation wherein variables have not been identified clearly or not measured directly, and thus, it can have an effect on the answers to the items.^[36] Correlated errors may be caused by method effects such as self-reported measurement method. On the other hand, correlated measurement errors can be the result of similar meaning or close to the meanings of words and phrases in both positive and negative statements.^[37]

Fear of death was one of the factors identified in this study. In fact, cancer and its effects are not only limited to patients, but also have a great impact on the lives of caregivers. Lo *et al.* (2011) reported fear of death as one of the factors affecting the DA in cancer patients in the last stages of the disease.^[38] Azaiza *et al.* (2011) stated that fear of death is due to lack of knowledge regarding the disease.^[39] Another study noted that the fear of death is common in the caregivers whose patients are suffering from the late stages of the disease. It can be due to the fact that caregivers observe their patients' pain and discomfort, and face with the thought and feeling about the death of themselves and the patients.^[40]

Another factor of the TDAS was bodily preoccupation with death and having painful death. Neel *et al.* (2015) reported physical suffering as one of the determinant factors which is related to the DA.^[41] Leming (1980) stated that 65% participants reported that their DA was related to their concerns about the attachment and having painful death.^[42] Although caregivers are trying to care the patients effectively, they thought that caring is insufficient and they are unable to help them. This factor leads to suffering from physical problem and increases DA.^[5]

The third factor of the DA structure was fear of loss of life and quick transition time. Another study introduced the passage of time as a factor in the validity of this scale.^[13]

Frazier and Foss-Goodman (1989) reported that passing of the time is a factor affecting DA to happen.^[43] Abdel-Khalek *et al.* (1993) introduced short longevity and future concern as latent factors for DA.^[33] Actually, the imposed pressures on caregivers lead to great suffering. Caregivers of cancer patients experience some degree of anxiety and have to meet their own needs and those of patients simultaneously. These factors create difficult situations to cope with.^[39]

Cognitive structures are influenced by individual differences based on structure, tolerance of ambiguity, and control of feeling uncertainty, which can affect the death perception and DA as well.^[28] Cognitive components of DA include attitudes, ability to conceptualize the future prediction, and awareness of the importance of death. Cognition refers to the beliefs about death, assumptions and beliefs associated with the experience of death, and knowing that the person eventually dies and cannot survive for long periods. Finally, recent research described DA as a multidimensional cognitive structure.^[44,45]

The results of the present study show that DA has good divergent and convergent validity. Schmitt (2014) stated that the scale has convergent validity when there is high correlation between the items that measure structure and the hidden variables and they share great variance with each other. He also noted that if the items of the structure have low correlation with other structures and share a small variance, the tool has good divergent validity.^[46,47]

Most people, even those whose job is to help dying patients, have difficulty in facing death and show different reactions to it.^[48] Nurses, because of the nature of their job, communicate more than other people with ill and dying patients and their families.^[49] Since care of dying patients is more complex than that of other patients, having sufficient knowledge, maturity, and positive attitude toward death can reduce DA even in health care providers such as nurses.^[31] Therefore, it is essential that nurses develop their skills and attitudes in the field of DA in dealing with patients and their families who have experienced this phenomenon, in order to offer better services.^[50]

In this study, there was no limitation. The reliability and validity of TDAS was approved in the present research. Researchers are recommended to compare the factor structure with other groups of people who are at risk of death.

CONCLUSION

The results show that the Persian version of TDAS has an acceptable validity and reliability and is a multidimensional structure. Based on the fact that this scale is discussed as a

two-dimensional structure in recent years, it is required to evaluate validity and reliability of the scale in similar groups. Being a valid and reliable instrument is considered as a key factor in the study of DA and leads to a better understanding of this phenomenon in the studied population.

Acknowledgments

The authors would like to express their gratitude to the family caregivers of cancer patients who bravely participated in this study and also Prof. William M. Bukowski for his cooperation in reviewing this paper. They are also grateful to Qazvin University of Medical Sciences, Qazvin, Iran for funding this research (No. 28.6.6169).

Financial support and sponsorship

Qazvin University of Medical Sciences (Grant No. 28.6.5758).

Conflicts of interest

There are no conflicts of interest.

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