

## Original Article





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**Abstract**

**Objectives.** Death anxiety (DA), a condition characterized by fear, angst, or panic related to the awareness of one’s own death, is commonly observed in advanced cancer patients. The aim of this study was to examine the psychometric properties of the Italian version of the Death and Dying Distress Scale (DADDS-IT) in a sample of patients with advanced cancer.

**Methods.** The sample included 200 Italian advanced cancer patients meeting eligibility criteria to access palliative care. Patients’ levels of DA were assessed by using the DADDS-IT, while the levels of depression, anxiety, demoralization, spiritual well-being, and symptom burden were assessed using the Patient Health Questionnaire-9, the Generalized Anxiety Disorder-7, the Demoralization Scale, the Functional Assessment of Chronic Illness Therapy–Spiritual Well-Being Scale, and the Edmonton Symptom Assessment System, respectively; Karnofsky Performance Status was used to measure functional impairment. Confirmatory factor analyses (CFA) of previous structures and exploratory factor analyses (EFA) were conducted.

**Results.** CFA revealed that none of the previous structures adequately fitted data from our sample. EFA revealed a 4-factor model comprising Finitude ( $\alpha = 0.91$ ), Regret ( $\alpha = 0.86$ ), Dying ( $\alpha = 0.88$ ), and Relational Burden ( $\alpha = 0.73$ ), accounting for the 77.1% of the variance. Dying subscore was higher in hospice patients than in those recruited in medical wards.

**Significance of results.** The present study provides further evidence that DA is a condition that deserves attention and that DADDS-IT shows good psychometric properties to support its use in research and clinical settings.

**Introduction**

Death anxiety (DA) has been defined as the emotional experience of fear, angst, or panic related to the awareness of one’s own death (Iverach *et al.* 2014; Russac *et al.* 2007; Sussman and Liu 2014). DA is common in individuals with advanced cancer (Neel *et al.* 2015; Soleimani *et al.* 2020) and associated with physical, psychological, and existential distress and psychiatric disorders (Cordova *et al.* 2017; Singer *et al.* 2010; Smith 2015). It has also been reported that DA can hinder shared care planning and end-of-life preparation in both patients and family members (Krause *et al.* 2015; Lau and Cheng 2011).

Relief of DA has been considered an important goal of palliative and cancer care (Singer *et al.* 2010; Smith 2015), and research has demonstrated that it can be alleviated by targeted psychotherapeutic interventions in individuals with advanced cancer (Rodin *et al.* 2018). However, research on DA assessment and treatment in advanced cancer has been relatively neglected compared to that on psychological symptoms, such as research on depression (Krebber *et al.* 2014; Saracino *et al.* 2017). This relative neglect in research and clinical practice may be partly related to the lack of a reliable and validated tools to assess DA in individuals with advanced disease (Neimeyer 1994). The availability of such a measure of DA would be of great value in facilitating research and clinical attention to this symptom.

The Death and Dying Distress Scale (DADDS) is a brief questionnaire developed to assess the level of distress related to the process of dying and death (Lo *et al.* 2011). A preliminary Canadian validation study (Krause *et al.* 2015) of the DADDS using exploratory factor analysis (EFA) found a single-factor structure as did a validation study of the German version of the DADDS (Engelmann *et al.* 2016). A more recent validation study with a larger sample

conducted by the original Canadian researchers, using a confirmatory factor analysis, supported a 2-factor structure (Shapiro et al. 2021). These factors were “Finitude,” related to awareness of the shortness of time (items 1–10: not having done the things I wanted to do; not having said all that I wanted to say; not having achieved my life goals; not having a future; the missed opportunities; out of time; the impact of my death on loved ones; and my own death and dying), and “Dying,” related to the process of dying (items 11–15: [death] happen suddenly or unexpectedly; be prolonged or drown out; happen when I am alone; happen with pain; and happen very soon).

Studies carried out in Italy document that patients with advanced and terminal disease show high levels of existential and spiritual distress that negatively affect quality of life and preparation for death (Bovero et al. 2016; Bovero et al. 2018; Grassi et al. 2017a). To our knowledge, however, no specific measure of DA has been validated in Italian-speaking individuals with advanced or terminal disease.

The aim of the present study was to evaluate the psychometric properties of an Italian adaptation of the DADDS (DADDS-IT) in a sample of patients with advanced cancer. Specifically, we aimed to evaluate the DADDS-IT factor structure, internal consistency, and construct validity. Based on previous findings (Andrea 2018; Bovero et al. 2016; Engelmann et al. 2016; Grassi et al. 2017a; Lo et al. 2011; Shapiro et al. 2021), we hypothesized that distress related to death and dying would be positively correlated with demoralization, depression, anxiety, and impairment in physical functioning and negatively correlated with spiritual well-being.

## Methods

### Participants and procedure

Ethical approval of the study was obtained from the Hospital Ethics Committee for Human Research of Turin (protocol number 0034403). Each patient included in the study was informed about the aims of the research and provided written informed consent. A convenience sample of patients with advanced cancer was recruited from March 2019 to December 2020 at the Città della Salute e della Scienza Hospital and at the Vittorio Valletta Hospice in Turin, Italy. Inclusion criteria were  $\geq 18$  years old, having a diagnosis of cancer, able to provide informed consent, and meeting eligibility criteria to access palliative care (National Law on Palliative Care and Pain Treatment, No. 38/2010). These criteria include being terminally ill with no available or appropriate curative treatment, having an unfavorable prognosis with a presumed life expectancy of 4 months or less, and scoring 50 or lower in the Karnofsky Performance Status (KPS). Exclusion criteria included having a diagnosis of any severe psychiatric disorder and cognitive impairment with an inability to provide informed consent or to complete the study procedures.

Patients were approached by a research assistant to complete the self-report scales; sociodemographic and clinical data were collected from medical records and clinical charts.

### Measures

#### Death anxiety

Death-related distress was assessed using the DADDS, a 15-item scale that was developed for use in advanced cancer care. The DADDS rates the intensity of death-related distress symptoms on a 6-point Likert scale (0 = “I haven’t been distressed by this

thought or preoccupation” and 5 = “I have been extremely distressed”). Higher scores indicate more severe death-related distress (scores range from 0 to 75). A native Italian speaker who is fluent in both languages and familiar with the measure translated the DADDS from English to Italian in consultation with the main author (R.C.) and with the developers (Lo et al. 2011). The measure was backtranslated into English by an external translator who was not familiar with the measure. The resulting English version was checked against the original English measure and discrepancies were resolved by a panel of experts.

#### Demoralization

The validated Italian version (Costantini et al. 2013) of the Demoralization Scale (DS) (Kissane et al. 2004) was used to assess demoralization symptoms. The DS is a 24-item measure, widely used in cancer and medical setting (Battaglia et al. 2020; Belvederi Murri et al. 2020a, 2020b), that rates the frequency of symptoms of demoralization during the past 2 weeks on a 5-point Likert scale (0 = never and 4 = all the time), with higher scores indicating more severe demoralization symptoms. In a sample of Italian cancer patients, the Italian version of the DS showed good internal consistency and a factor structure comprising 4 factors, namely Dysphoria, Loss of Meaning and Purpose, Disheartenment, and Sense of Failure (Grassi et al. 2017b).

#### Depressive symptoms

The Italian validated version (Rizzo et al. 2000) of the 9-item Patient Health Questionnaire (PHQ-9) (Spitzer et al. 1999) was used to assess the severity of depressive symptoms during the last 2 weeks. For each item, patients were asked to assess how much they were bothered by the symptoms over the last 2 weeks. There are 4 answer options: not at all (0), several days (1), more than half of the days (2), and nearly every day (3). The sum score (range 0–27) indicates the degree of depression, with scores of  $\geq 5$ ,  $\geq 10$ , and  $\geq 15$  representing mild, moderate, and severe levels of depression.

#### Anxiety symptoms

Anxiety symptoms were assessed using the General Anxiety Disorder (GAD-7) (Spitzer et al. 2006), a self-report questionnaire composed of 7 items investigating GAD. Each of the 7 items is scored from 0 (i.e. “Not at all”) to 3 (i.e. “Nearly every day”); the GAD-7 score ranges from 0 to 21. For our study, we used the official Italian version freely downloadable on the PHQ Web site (<http://www.phqscreeners.com>).

#### Spiritual well-being

Spiritual well-being was assessed using the validated Italian version (Rabitti et al. 2020) of the Functional Assessment of Chronic Illness Therapy – Spiritual Well-Being Scale (FACIT-Sp) (Brady et al. 1999). It is a 12-item scale, which comprises 3 factors, meaning, peace, and faith. It is widely used in cancer settings where it has been shown to be a valid self-report tool (Canada et al. 2008). Higher scores indicate better spiritual well-being.

#### Symptom burden and physical functioning

The presence of cancer-related physical distress was assessed using the Edmonton Symptom Assessment System (ESAS-Revised) (Bruera et al. 1991), in its Italian validated version (Ripamonti et al. 2022). It rates the severity of physical (i.e., pain, tiredness, nausea, drowsiness, lack of appetite, feeling of not well-being,

and shortness of breath) and psychological (i.e., depression and anxiety) symptoms on a 11-point visual analog scale, ranging from 0 (no symptom) to 10 (the worst symptom). In our analysis, we computed the sum of physical symptoms (ESAS-Physical) and excluded psychological symptoms because of redundancy with the distress measures. Higher scores indicate higher physical symptom burden.

The KPS is a clinician-rated scale measuring functional impairment (Schag et al. 1984). High scores indicate better physical functioning and more ability to perform work activities, activities of daily living, and personal care. Scores on the KPS range from 100 (no signs of functional impairment) to 0 (death) in decrements of 10.

### Statistical analysis

We approached our investigation of the DADDS structure with the following steps. First, confirmatory factor analyses (CFAs) were conducted to estimate the fit of available factor structures.

CFAs were conducted using the *cfa* function of the *lavaan* R package using diagonally weighted least squares; variables were treated as ordinal categorical data using the *ordered* argument. We selected the following CFA indices to evaluate the model fit: (1) the comparative fit index (CFI), (2) Tucker–Lewis index (TLI), and (3) the root mean square error of approximation (RMSEA) with its confidence interval. Factor models showing  $CFI \geq 0.95$ ,  $TLI \geq 0.95$ , and  $RMSEA \leq 0.06$  were considered to show good model fit. We tested both the single-factor structure (Engelmann et al. 2016; Krause et al. 2015; Lo et al. 2011) and the 2-factor structure (Shapiro et al. 2021).

Second, we evaluated the factor structure of the DADDS in our sample using EFA with the principal factor method and Promax rotation, since significant correlations between factor scores were expected. The EFA was conducted using Statistical Package for Social Sciences (SPSS) version 22. The optimal number of factors was fixed according to the results of a parallel analysis with 1,000 resampling iterations, which we conducted using the *fa.parallel* function of the *psych* R package. Adequate sampling was assured by Kaiser–Meyer–Olkin  $> 0.9$  (Kaiser 1970) and a significant Bartlett's  $\alpha$  value that confirmed sphericity (Bartlett 1954).

Third, we estimated the internal consistency by calculating Cronbach's  $\alpha$  for the total scale as well as for each factor. Cronbach's  $\alpha \geq 0.70$  is generally considered an index of good internal consistency (Cortina 1993). Cronbach's  $\alpha$  with item deletion for each item was also calculated.

Analysis of variance, *t*-test, and chi-square were used to determine the differences between groups when comparing DADDS total and factors scores and its subscales with clinical and sociodemographic variables. Construct validity was analyzed by using spearman correlation test between DADDS and the total scores of the PHQ-9, GAD-7, FACIT-Sp-12 and its factors, DS and its factors, KPS and ESAS-Physical. The SPSS version 22 was used for these analyses, with the level of statistical significance set at  $p < 0.05$ .

### Results

A total of 268 patients meeting the inclusion criteria were approached and asked to participate in the study. Of these, 68 (25.4%) did not enter the study (25 of these patients refused to participate because of severe distress resulting from the disease and 43 passed away before the interview). The final sample comprised 200

**Table 1.** Sample sociodemographics ( $N = 200$ )

Age, $M \pm SD$	68.3 $\pm$ 13
Sex, $n$ (%)	
Male	121 (60.5%)
Female	78 (39.0%)
Location, $n$ (%)	
Hospice	79 (39.5%)
Ward	121 (60.5%)
Education, $n$ (%)	
Primary school	48 (24.0%)
Middle school	68 (34.0%)
High school	71 (35.5%)
Bachelor degree or higher	13 (6.5%)
Working status, $n$ (%)	
Employed	59 (29.5%)
Unemployed	13 (6.5%)
Retired	128 (64.0%)
Civil status, $n$ (%)	
Married	134 (67.0%)
Unmarried	29 (14.5%)
Divorced	12 (6.0%)
Widower	22 (11.0)
Other	3 (1.5%)
Religious practice, $n$ (%)	
Yes	69 (34.5%)
No	131 (65.5%)
Religion, $n$ (%)	
Christian	185 (92.5%)
Atheist/Agnostic	15 (7.5%)
Primary cancer type, $n$ (%)	
Lung	43 (21.5%)
Breast	15 (7.5%)
Gynecologic	8 (4.0%)
Genitourinary	27 (13.6%)
Melanoma	7 (3.5%)
Endocrine	4 (2.0%)
Gastrointestinal	78 (39.4%)
Other	11 (5.5%)
Stage, $n$ (%)	
Local	10 (5.0%)
Loco-regional	37 (18.5%)
Metastatic	153 (76.5%)

patients (74.6% of those approached) with a mean age of 68.3 years; the majority of participants were male (60.5%) and had metastatic cancer (76.5%) (Table 1).

**Table 2.** Confirmatory factor analysis

Confirmatory factor analyses	Factors	CFI	TLI	RMSEA <sup>a</sup>	RMSEA IC (90%)
Shapiro et al. (2021)	2	0.896	0.877	0.181	0.168–0.194
Engelmann et al. (2016), Krause et al. (2015), Lo et al. (2011)	1	0.684	0.631	0.192	0.179–0.205

CFI, comparative fit index; TLI, Tucker–Lewis index; and RMSEA, root mean square error of approximation.

<sup>a</sup>Factor models with a good fit on factor analyses show CFI, TLI  $\geq$  0.95, and RMSEA  $<$  0.08.

### CFAs, exploratory factor structure and internal consistency of the DADDS

CFAs showed that both the single- and the 2-factor structures from previous studies produced poor model fit (CFI = 0.896, TLI = 0.877, and RMSEA = 0.181 for the 2-factor model, and CFI = 0.684, TLI = 0.631, and RMSEA = 0.192 for the single-factor model; Table 2).

Parallel analysis suggested a 4-factor extraction. Table 3 shows the results of the EFA with the 4-factor solution, which explained the 77.1% of the variance. The Kaiser–Meyer–Olkin measure of sample adequacy was 0.892, indicating sample adequacy. The first factor, *Finitude*, consisted of 6 items (items 4, 5, 7, 10, 11, and 15) and reflected the awareness of shortness of time. The second factor, *Regret*, comprised items 1, 2, 3, and 6 and referred to distress related to unaccomplished existential goals. The third factor, *Dying*, consisted of 3 items (items 12, 13, and 14) and reflected distress related to the process of dying, while the fourth factor, *Relational Burden*, comprised 2 items (item 8 and 9) and described distress related to the concern about being a burden to others. Correlations among factors ranged from weak ( $r = 0.33$ ) to strong ( $r = 0.69$ ) (Table 5). Cronbach's  $\alpha$  coefficients indicated good levels of internal consistency for DADDS total and *Finitude*, *Regret*, and *Dying* subscales (DADDS total,  $\alpha = 0.924$ ; *Finitude*,  $\alpha = 0.918$ ; *Regret*,  $\alpha = 0.860$ ; *Dying*,  $\alpha = 0.888$ ) and acceptable levels of internal consistency for *Relational Burden* subscale ( $\alpha = 0.731$ ) (Table 4).

### Descriptive characteristics of the DADDS

Skewness and kurtosis scores of the items suggest a normal distribution (Table 4). The most reported distressing concern was related to the fear of dying with a lot of pain and suffering ( $M = 3.45$ ,  $SD = 1.61$ ), while the least distressing concern was related to not having achieved goals and ambitions in life ( $M = 1.47$ ,  $SD = 1.26$ ). The mean score of DADDS total was 37.07 ( $SD = 15.06$ ). The *Finitude* ( $M = 1.06$ ,  $SD = 0.52$ ) and *Regret* ( $M = 1.20$ ,  $SD = 0.42$ ) standardized mean subscores were higher than the 2 other DADDS factors' mean subscores, *Dying* ( $M = 0.60$ ,  $SD = 0.30$ ) and *Relational Burden* ( $M = 0.67$ ,  $SD = 0.36$ ).

### Construct validity

No differences were found according to gender, working status (employed vs. unemployed), social status (married/cohabiting partner vs. unmarried/widowed), religious practice (practicing vs. not practicing), and disease stage (all  $p > 0.05$ ). The only significant difference was found in *Dying* subscore, which was higher in hospice patients ( $M = 10.89$ ,  $SD = 4.61$ ) than in those recruited

from a medical ward ( $M = 8.0$ ,  $SD = 4.17$ ;  $t = 4.6$ ,  $df = 198$ ,  $p < 0.01$ ).

Pearson correlations between DADDS total, DADDS factors, and validity measures are shown in Table 5. High intercorrelations were found among the single DADDS dimensions. The DADDS total score was moderately correlated with demoralization ( $r = 0.5$ ,  $p < 0.01$ ), PHQ-9 total score ( $r = 0.39$ ,  $p < 0.01$ ), and GAD-7 total score ( $r = 0.49$ ,  $p < 0.01$ ). Lower correlations were found between DADDS total and FACIT-Sp total score ( $r = -0.29$ ,  $p < 0.01$ ) and ESAS-Physical ( $r = 0.33$ ,  $p < 0.05$ ), while no significant correlation was found between DADDS total score and KPS ( $p > 0.05$ ).

Overall, the *Finitude* and *Regret* subscale scores were more strongly correlated with anxiety symptoms (respectively,  $r = 0.49$ ,  $p < 0.01$  and  $r = 0.44$ ,  $p < 0.01$ ) than *Dying* and *Relational Burden* subscale scores ( $r = 0.28$ ,  $p < 0.01$  and  $r = 0.22$ ,  $p < 0.01$ ).

This was also the case for depressive symptoms ( $r = 0.34$ ,  $p < 0.01$  for *Finitude* and  $r = 0.40$ ,  $p < 0.01$  for *Regret* vs.  $r = 0.22$ ,  $p < 0.01$  for *Dying* and  $r = 0.27$ ,  $p < 0.01$  for *Relational Burden*) and ESAS-Physical symptoms (respectively,  $r = 0.31$ ,  $p < 0.01$  and  $r = 0.31$ ,  $p < 0.01$  vs.  $r = 0.14$ ,  $p < 0.05$  and  $r = 0.27$ ,  $p < 0.01$ ).

*Finitude*, *Regret*, and *Dying* showed a moderate correlation with DS total score (respectively,  $r = 0.40$ ,  $p < 0.01$ ;  $r = 0.50$ ,  $p < 0.01$ ; and  $r = 0.39$ ,  $p < 0.01$ ), while *Relational Burden* showed the lowest correlations with DS total score ( $r = 0.29$ ,  $p < 0.01$ ). *Finitude* was moderately correlated with DS subscale *Disheartenment* ( $r = 0.43$ ,  $p < 0.01$ ) and *Dysphoria* ( $r = 0.41$ ,  $p < 0.01$ ) but more weakly correlated with *Sense of Failure* ( $r = 0.20$ ,  $p < 0.01$ ) and *Loss of Meaning* ( $r = 0.27$ ,  $p < 0.01$ ). *Regret* was moderately correlated with *Disheartenment* ( $r = 0.44$ ,  $p < 0.01$ ), *Dysphoria* ( $r = 0.51$ ,  $p < 0.01$ ), and *Loss of Meaning* ( $r = 0.45$ ,  $p < 0.01$ ) and weakly correlated with *Sense of Failure* ( $r = 0.24$ ,  $p < 0.01$ ); *Dying* was moderately correlated with *Disheartenment* ( $r = 0.44$ ,  $p < 0.01$ ) and *Dysphoria* ( $r = 0.41$ ,  $p < 0.01$ ) and to a lesser degree with the other factors. No significant correlations were found between *Relational Burden* and *Sense of Failure*, while low to moderate correlations were found with *Disheartenment* ( $r = 0.27$ ,  $p < 0.01$ ), *Dysphoria* ( $r = 0.30$ ,  $p < 0.01$ ), and *Loss of Meaning* ( $r = 0.30$ ,  $p < 0.01$ ).

Spiritual well-being, as measured by FACIT-Sp, was negatively correlated with *Finitude*, *Regret*, and *Dying* (respectively,  $r = -0.26$ ,  $p < 0.01$ ;  $r = -0.27$ ,  $p < 0.01$ ; and  $r = -0.20$ ,  $p < 0.01$ ). Regarding FACIT-Sp subscales, the strongest correlations were found with FACIT-Sp *Peace* ( $r = -0.41$ ,  $p < 0.01$  and  $r = -0.31$ ,  $p < 0.01$ , respectively). No correlations were found between any DADDS-IT subscale and FACIT-Sp *Faith*, while FACIT-Sp *Meaning* was weakly correlated only with *Regret* ( $r = -0.26$ ,  $p < 0.01$ ), while except for *Dying* ( $r = 0.21$ ,  $p < 0.01$ ), no DADDS-IT subscale was correlated to KPS scores.

### Discussion

The present study aimed to evaluate the psychometric properties of the Italian version of the DADDS (DADDS-IT) in terminally ill patients with a life expectancy of a few weeks. This validation study of the DADDS-IT, the first of its kind, identified a 4-factor model. These factors are “*Finitude*,” consisting of items assessing distress related to reflections on the shortness of time; “*Regret*,” including items assessing distress about what will be left unaccomplished; “*Dying*,” reflecting distress and fears related to the process of death and dying; and “*Relational Burden*,” accounting for distress about being a burden to others or causing them to suffer. The last factor is consistent with the suggestion of Shapiro et al. (2021) on the



**Table 3.** Exploratory factor analysis

	Factor 1	Factor 2	Factor 3	Factor 4
<i>Factor 1. Finitude (explained variance = 49.24%)</i>				
5. Not having a future	<b>0.952</b>	0.114	-0.174	-0.043
7. Running out of time	<b>0.861</b>	0.010	0.036	0.049
10. My own death and dying	<b>0.848</b>	-0.063	0.007	0.130
4. Not knowing what happens near the end of life	<b>0.729</b>	0.260	0.098	-0.226
15. Happen very soon	<b>0.680</b>	-0.191	0.279	0.058
11. Happen suddenly or unexpectedly	<b>0.576</b>	0.032	0.366	-0.109
<i>Factor 2. Regret (explained variance = 13.72%)</i>				
3. Not having achieved my life goals and ambitions	0.026	<b>0.902</b>	-0.097	-0.003
2. Not having said all that I wanted to say to the people I care about	-0.083	<b>0.790</b>	0.154	0.129
6. The missed opportunities in my life	-0.037	<b>0.775</b>	0.280	-0.064
1. Not having done all the things I wanted to do	0.201	<b>0.759</b>	-0.305	0.112
<i>Factor 3. Dying (explained variance = 8.10%)</i>				
13. Happen when I am alone	-0.065	-0.023	<b>0.991</b>	-0.061
12. Be prolonged or drawn out	0.191	0.075	<b>0.722</b>	0.018
14. Happen with a lot of pain or suffering	0.146	-0.068	<b>0.704</b>	0.223
<i>Factor 4. Relational Burden (explained variance = 6.05%)</i>				
8. Being a burden to others	-0.252	0.189	0.101	<b>0.889</b>
9. The impact of my death on my loved ones	0.339	-0.082	-0.072	<b>0.779</b>

Parallel analysis suggested that the 4-factor EFA solution was optimal.

Factor loadings are displayed in bold character.

KMO = 0.892. Bartlett's test of sphericity  $\chi^2 = 2125.992$ ,  $df = 105$ ,  $p < 0.001$ .

presence in the DADDS of a dimension of death distress related to concern about the burden on others.

The findings of the present study shed light on the different facets of DA in patients with advanced and terminal disease. We found good internal consistency of DADDS-IT and its subscales. Unlike the findings of Shapiro et al. (2021), we did not detect sociodemographic differences related to scores on DADDS-IT and its factors. We found differences in Dying scores between hospice and hospital patients, indicating greater distress related to the process of dying in hospice patients who may have been closer to the end of life. As in the Canadian research, moderate mean levels of DA have been found. Greater endorsement of the Regret and of the Finitude factors suggests that reflections on death and on the past primarily contribute to DA in patients with advanced medical conditions and support the need for tailored psychotherapeutic interventions addressing these neglected themes (Caruso et al. 2020; Mah et al. 2020; Rodin 2018).

The DADDS-IT showed good construct validity based on its significant positive correlations with the severity of symptoms of demoralization, anxiety, and depression, as has been found in previous research on the DADDS (Engelmann et al. 2016; Krause et al. 2015; Lo et al. 2011; Shapiro et al. 2021). In particular, the DADDS-IT and the Finitude and Regret subscale scores were positively correlated with scores on the PHQ9, GAD7, and ESAS-Physical. This was also true, at a weaker level, for Dying and Relational Burden subscales. DADDS-IT total score was also positively correlated with DS total score, while Finitude, Regret, and Dying subscales were significantly correlated with Failure subscale. All DADDS-IT subscales correlated positively with DS

Disheartenment, Dysphoria, and Loss of Meaning subscales. These findings confirm previous research indicating an association and mutual reinforcement between DA and other existential dimensions of suffering in advanced medical conditions (Neel et al. 2015; Rodin 2018; Scheffold et al. 2018).

The significant inverse correlation between scores on the DADDS-IT and FACIT-Sp-12 and, in particular, with the Peace subscale of the FACIT-Sp-12 suggests that spiritual well-being may protect against end-of-life despair (Bovero et al. 2019). This is consistent with findings that a sense of purpose and meaning at the end of life reduces the desire for a hastened death (Bovero et al. 2021; Daneault et al. 2016; Eun et al. 2017).

The positive association between DA and symptom burden, as assessed with the ESAS, supports a previous finding that death-related distress may be heightened by the severity of physical symptoms at the end of life (An et al. 2018). This finding supports the recommendation that integrated treatments that address both physical and psychological distress may be needed to ameliorate DA in this population (Kaasa et al. 2018; Neel et al. 2015; Oechsle 2019; Rodin et al. 2009).

A strength of the present study is that it validates in a large sample an Italian language measure of distress related to death and dying in patients with advanced cancer. Four factors of the DADDS-IT were identified in this study, which may have clinical value. A limitation in the results is that the Relational Burden factor consists of only 2 items, while subscales should optimally consist of at least 4 to 6 items. However, the Relational Burden factor appeared to fully meet the criterion of internal consistency. Further, the cross-sectional design of this study in patients near

**Table 4.** Internal consistency and item-total statistics of 15-item DADDS

	Total DADDS	Reliability				Item characteristics			
		Factor 1. Finitude	Factor 2. Regret	Factor 3. Dying	Factor 4. Relational Burden	Mean	SD	Skewness	Kurtosis
Cronbach's $\alpha$	0.924	0.918	0.860	0.888	0.731				
<i>Cronbach's <math>\alpha</math> if item deleted</i>									
1. Not having done all the things I wanted to do	0.924		0.835			1.91	1.35	0.23	-0.88
2. Not having said all that I wanted to say to the people I care about	0.921		0.822			1.53	1.20	0.44	-0.69
3. Not having achieved my life goals and ambitions	0.923		0.794			1.47	1.26	0.70	-0.10
4. Not knowing what happens near the end of life	0.917	0.908				2.42	1.43	-0.10	-0.93
5. Not having a future	0.916	0.901				2.74	1.42	-0.28	-0.91
6. The missed opportunities in my life	0.920		0.832			1.48	1.34	0.67	-0.30
7. Running out of time	0.914	0.891				2.73	1.53	-0.23	-0.95
8. Being a burden to others	0.924			-		2.43	1.35	-0.08	-0.69
9. The impact of my death on my loved ones	0.920			-		3.08	1.47	-0.57	-0.54
10. My own death and dying	0.915	0.900				2.79	1.58	-0.39	-0.97
11. Happen suddenly or unexpectedly	0.917	0.910				2.36	1.56	0.33	-1.05
12. Be prolonged or drawn out	0.916			0.830		2.90	1.66	-0.46	-0.98
13. Happen when I am alone	0.921			0.883		2.80	1.77	-0.26	-1.27
14. Happen with a lot of pain or suffering	0.917			0.812		3.45	1.61	-0.96	-0.11
15. Happen very soon	0.918	0.912				2.98	1.70	-0.44	-1.07

**Table 5.** Correlations between DADDS scores and validity measures

	DADDS total	Finitude	Regret	Dying	Relational Burden	GAD-7	PHQ-9	DS	Sense of failure	Disheartenment	Dysphoria	Loss of Meaning	FACIT-Sp	Peace	Faith	Meaning	ESAS-Physical	KPS
DADDS total	1.00	0.92**	0.69**	0.81**	0.66**	0.49**	0.39**	0.50**	0.22**	0.51**	0.51**	0.38**	-0.29**	-0.41**	-0.10	-0.15*	0.33**	-0.11
Finitude		1.00	0.50**	0.69**	0.48**	0.49**	0.34**	0.40**	0.20**	0.43**	0.41**	0.27**	-0.26**	-0.41**	-0.10	-0.08	0.31**	-0.04
Regret			1.00	0.33**	0.43**	0.44**	0.40**	0.50**	0.24**	0.44**	0.51**	0.45**	-0.27**	-0.31**	-0.08	-0.26**	0.31**	-0.04
Dying				1.00	0.48**	0.28**	0.22**	0.39**	0.14**	0.44**	0.41**	0.26**	-0.20**	-0.29**	-0.08	-0.09	0.14**	-0.21**
Relational Burden					1.00	0.22**	0.27**	0.29**	0.06	0.27**	0.30**	0.28**	-0.13	-0.21**	-0.03	-0.07	0.27**	-0.07
GAD-7						1.00	0.60**	0.62**	0.38**	0.62**	0.53**	0.48**	-0.46**	-0.59**	-0.17	-0.29**	0.37**	0.02
PHQ-9							1.00	0.72**	0.53**	0.64**	0.47**	0.68**	-0.58**	-0.59**	-0.22**	-0.57**	0.55**	-0.09
DS								1.00	0.72**	0.92**	0.74**	0.86**	-0.71**	-0.71**	-0.31**	-0.64**	0.40**	-0.20**
Sense of failure									1.00	0.62**	0.36**	0.52**	-0.66**	-0.64**	-0.27**	-0.64**	0.35**	-0.10
Disheartenment										1.00	0.61**	0.69**	-0.68**	-0.73**	-0.34**	-0.51**	0.38**	-0.21**
Dysphoria											1.00	0.52**	-0.45**	-0.27**	-0.29**	0.37**	-0.17**	-0.16**
Loss of Meaning												1.00	-0.56**	-0.50**	-0.15	-0.69**	0.26**	-0.16**
FACIT-Sp													1.00	0.83**	0.75**	0.65**	-0.29**	0.14**
Peace														1.00	0.42**	0.48**	-0.38**	0.12
Faith															1.00	0.13	-0.09	0.11
Meaning																1.00	-0.23**	0.10
ESAS-Physical																	1.00	-0.06
KPS																		1.00

DADDS, Death and Dying Distress Scale; GAD-7, Generalized Anxiety Disorder-7; PHQ-9, Patient Health Questionnaire; KPS, Karnofsky Performance Status; DS, Demoralization Scale; FACIT-Sp, Functional Assessment of Chronic Illness Therapy – Spiritual Well-Being; ESAS-Physical, Edmonton Symptom Assessment System – Physical symptom total score.  
 \*\*0.01 level.  
 \*0.05 level.

the end of life did not allow determination of whether changes in DA could be identified with increasing proximity to death or in response to therapeutic interventions. Longitudinal studies are needed to address such questions and to determine to what extent study findings can be replicated in other cultures and languages. Further studies should be carried out to improve knowledge about the relations between DA and other domains of end-of-life care.

### Clinical implications

The DADDS-IT can be of value to assess death-related distress in patients with advanced cancer and to determine the impact of psychosocial and palliative interventions on this outcome. The factor structure of this measure covers a wide spectrum of existential distress and therefore might provide new opportunities to examine and better understand the different facets of suffering in patients with advanced cancer. The DADDS-IT may also be of value as an outcome measure of a wide range of therapeutic interventions that may have a therapeutic effect on DA in this population (Breitbart et al. 2015; Caruso et al. 2020; Chochinov et al. 2011; Rodin et al. 2018; Rodin and Zimmermann 2008).

### Conclusions

For the first time, a DADDS validation study has been carried out in Italy. The findings of this study suggest that the DADDS-IT is a reliable and valid instrument for assessing DA in individuals with advanced cancer near the end of life. Four factors were identified that showed good internal consistency and construct validity, suggesting that the DADDS-IT and its factor scores could be useful to assess death-related distress in this population and its responsiveness to therapeutic interventions. Future research should include longitudinal studies to identify such effects and to determine changes in death-related distress.

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