



# Depression as mediator and or moderator on the relationship between hopelessness and patients' desire for hastened death

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## Abstract

**Purpose** Previous findings have shown that depression in advanced stages of cancer is associated with hopelessness and frequently with wishes for hastened death. The current study tries to investigate the relationship between hopelessness and desire for hastened death and if depression may be a moderator and/or mediator role in patients with advanced cancer.

**Method** The participants were 102 patients with advanced cancer which they completed the Beck Hopelessness Scale (BHS), the Greek Schedule of Attitudes towards Hastened Death (G-SAHD), and the Greek Beck Depression Inventory (BDI).

**Results** Depression was highly correlated with hopelessness and desire for hastened death. Mediation analyses revealed that hopelessness influenced desire for hastened death as well as indirectly by its effect on depression. Similarly, depression was found as moderator in the relationship between hopelessness with desire for hastened death.

**Conclusions** Hopelessness and desire for hastened death in patients with advanced cancer should be diagnosed and treated by taking into consideration the optimum care of depression as a priority in palliative care.

**Keywords** Advanced cancer · Hastened death · Depression · Hopelessness · Mediator · Moderator

## Introduction

Emotional distress is a normal consequence to the diagnosis of a life-threatening disease such as cancer. The underlying fears related to patients' distress are the fear of a painful death, of becoming disabled, dependent, and thus a burden to their relatives and caregivers [1]. Cancer disease and its progress frequently emerge before a depressive episode; however, this

relationship is not always straightforward; many times, stressful life events and situations may also cause a depression episode [2]. Recent studies suggested that almost 75% of cancer patients suffer from depression [3, 4]. However, the prevalence rates depend on the different diagnostic instruments or even the differences concerning cancer type, cancer stage, and treatment [5–7].

Depression in advanced stages of cancer was associated with several sociodemographic variables, previous and recent losses, cancer-related factors such as poorly controlled symptoms and poor performance status, cancer type, treatment factors, previous mood disorders, and other psychological factors [8–12]; depression may also deteriorate the distress from cancer symptoms and a risk factor for effective coping and poor survival [11, 13]. Furthermore, it seemed that cancer symptomatology and treatments' side effects frequently overlap with depressive symptoms [6]. Additionally, during assessment of depression in terminally ill patients, feelings of hopelessness should be investigated in-depth [14].

Hope is an important mechanism in cancer patients even in advanced stages; the importance of maintaining hope could have positive effect for the patients for better symptom control, continuity of their treatment enabling them to cope with their disease, and its prognosis in a meaningful perspective [14–16].

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On the other hand, feelings of hopelessness may be noticeable in cancer patients especially in advanced stages characterized by negative thoughts, feelings, expectations about the future, ineffective coping strategies, and pessimistic attitude towards the future [17–19]. Both depression and hopelessness are risk factors for suicidal ideation; feelings of hopelessness are also important in understanding desire for hastened death [8].

The desire for hastened death, in turn, is a construct that may be present in patients at advanced stages of disease [8]. Wishes and desires for hastened death may express different and several meanings. It may be a temporary or a permanent wish depending on underlying factors such as fear of devastating pain and suffering [8, 20]. Factors that might influence hastened death wishes are depression and hopelessness [20–23]. In addition, it seemed that physical symptoms such as pain have less impact on that wishes related to other factors authors suggested as more important such as patients' perceptions of being burden to others, lack of social support, existential suffering, loss of dignity, depression, and hopelessness [24–27]. In a recent review and meta-ethnographic study, authors indicated the primary and most important factor on desire for death is the whole suffering of the terminally ill cancer patients including suffering on their self and identity [28].

Depression and hopelessness, as it has been also stated, are prominent factors influencing desires for such wishes [8, 28, 29].

Therefore, in the current study, we aimed to investigate not only the relationship between depression, hopelessness, and desire for death in advanced stages of cancer, but also to explore the role of depression as moderator or mediation factor in the relationship between hopelessness and desire for hastened death. More specifically, the research questions for the current study were intended (1) to explore if depression mediated the effect of hopelessness on the patients attitudes towards hastened death and (2) to explore moderation effect between depression and hopelessness and affect on the patients' attitudes towards hastened death.

## Methods

### Patients and methods

The current study was carried out in an outpatient palliative care unit in Greece; 125 consecutive patients with advanced cancer visited the unit for palliative care. Inclusion criteria were cancer diagnosis, patients stage IV, age > 18 years, effective communication with the personnel, and participants written informed consent. Exclusion criteria were history of current drug abuse, psychotic illness, and cognitive impairment. Twenty-three patients (18.4%) were excluded due to their refusal to complete the assessment tools or they lived far away from Athens. The final sample consisted of 102 cancer patients. Patients were seen individually either at outpatient clinic

or on the wards. The study was approved by the hospital's institutional review board. Informed consent was obtained from all individual participants included in the study.

### Procedure

One researcher for the unit interviewed the patients for their sociodemographic characteristics and their background medical history. The self-report measures included (a) The Greek Schedule of Attitudes towards Hastened Death (G-SAHD) [30], a measure of the desire for hastened death [30, 31]. (b) The Greek Beck Depression Inventory (BDI) was used [32]. Its Cronbach's alpha was 0.906. The (BDI) [33] is a 21-item self-report scale, measuring characteristic attitudes and symptoms of depression. (c) The Beck Hopelessness Scale (BHS) [34] is a 20-item self-report inventory measuring hopelessness with Cronbach's alpha of patients was 0.937.

### Statistical analysis

Firstly, correlations between depression, hopelessness, and hastened death were explored using Spearman's correlation coefficients. Secondly, regression-based PROCESS with bootstrapping 5000 samples [35] was used to evaluate in what extent the effect of hopelessness was mediated through perceived depression and desire for hastened death. Bootstrapping involves repeatedly randomly sampling observations with replacement from the data set to compute the desired statistic in each resample. Over hundreds, or thousands, of bootstrap resamples provide an approximation of the sampling distribution of the statistic of interest.

Desire for hastened death as the dependent variable, hopelessness as the predictor, and depression as mediator were considered significant if the 95% bias-corrected confidence interval of the indirect effect did not include 0. Unstandardized indirect effects were computed for each of 5000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5 and 97.5 percentiles. Finally, a moderating analysis was performed with PROCESS model investigating the role of depression on the relationship between hopelessness and desire for hastened death. Statistical significance was set at  $p < 0.05$ . Statistical analyses were conducted using SPSS version 21 (IBM Corp, Armonk, NY) and the macro PROCESS for mediation and moderation analyses.

## Results

Table 1 presents the demographic and disease-related characteristics, their mean values and standard deviations (sd), and the ranges of all variables. Depression showed high

**Table 1** Demographic and disease related patient's characteristics

Gender, male/female, <i>n</i> (%)		46 (45.1%)/56 (54.9%)
Age		62.81 ± 13.71 (26–87)
ECOG, 0–1/2–3, <i>n</i> (%)		30 (29.4%)/72 (70.6%)
Cancer location, <i>n</i> (%)	Lung	23 (22.5%)
	Breast	22 (21.6%)
	Gastrointestinal	22 (21.6%)
	Urogenital	24 (23.5%)
	Other	11 (10.8%)
Metastasis, no/yes		42 (41.2%)/60 (58.8%)
Beck Depression Inventory (BDI), range (0–63) <sup>a</sup>		16.99 ± 10.24 (1–45)
Beck Hopelessness Scale (BHS), range (0–20) <sup>a</sup>		7.71 ± 5.91 (0–20)
Schedule of Attitudes toward Hastened Death (SAHD), range (0–20) <sup>a</sup>		2.95 ± 3.95 (0–17)

All values are presented as mean ± SD (observed range)

<sup>a</sup> Possible range

statistically significant correlations with hopelessness and attitudes of hastened death (Table 2).

## Mediation analyses

Bootstrapping regression analyses using the PROCESS method [36] was used for mediation analysis. Mediation analysis (Fig. 1) was performed in order to investigate if depression mediated the effect of hopelessness on desire for hastened death. The analysis allowed the examination of whether hopelessness predicted desire for hastened death and if this relationship would weaken when depression (i.e., the mediator) was present. Results indicated that hopelessness was a significant predictor of depression ( $b = .87$ ,  $(SE) = .15$ ,  $p < .001$ ), and that depression was a significant predictor of desire for hastened death ( $b = .09$ ,  $(SE) = .03$ ,  $p < .001$ ). The current findings support the mediational model for depression. The indirect effect using a bootstrap estimation was tested. The indirect coefficient for depression was significant ( $b = .08$ ,  $SE = .04$ ,  $(CI) = .01-.20$ ) consistent with partial mediation. The ratio of indirect to total effect for depression ( $b = .18$ ,  $SE = .10$ ,  $(CI) = .02-.430$ ) reveals that depression accounts for 18% of the shared variance between hopelessness and desire for hastened death. The ratio of the indirect to direct effect of depression showed that depression accounts for approximately 22% of the shared variance ( $b = .22$ ,  $SE = .18$ ,  $(CI) = .02-.74$ ). The direct effect of hopelessness on desire for hastened death remained also significant when depression was included as a mediator ( $b = .38$ ,  $SE = .06$ ,  $p < .001$ ).

## Moderation analyses

The current analysis was explored so as to examine if the relationship between hopelessness and desire for hastened

death is strong for patients with depression. For the desire for hastened death, the main effects of hopelessness and depression as well as the interaction effects accounted for 57% of the variance ( $F = 33$ ,  $p < .01$ ). Similarly, the interaction for hopelessness, desire for hastened death, and depression were significant ( $R^2$  change = .06%,  $F = 14.22$ ,  $p = .0003$ ), suggesting evidence for moderation (Fig. 2).

## Discussion

Following the moderation and mediation model, the current study aimed to investigate the role of depression on the relationship between hopelessness and desire for hastened death in patients with advanced cancer. Depression has been investigated in previous studies as the most common disorder in terminally ill cancer patients [37]. The high prevalence of depression has been estimated in all stages of cancer but frequently exists in advanced stages [38]. However, in palliative care settings, patients may not be recognized and treated due to ineffective diagnosis [14].

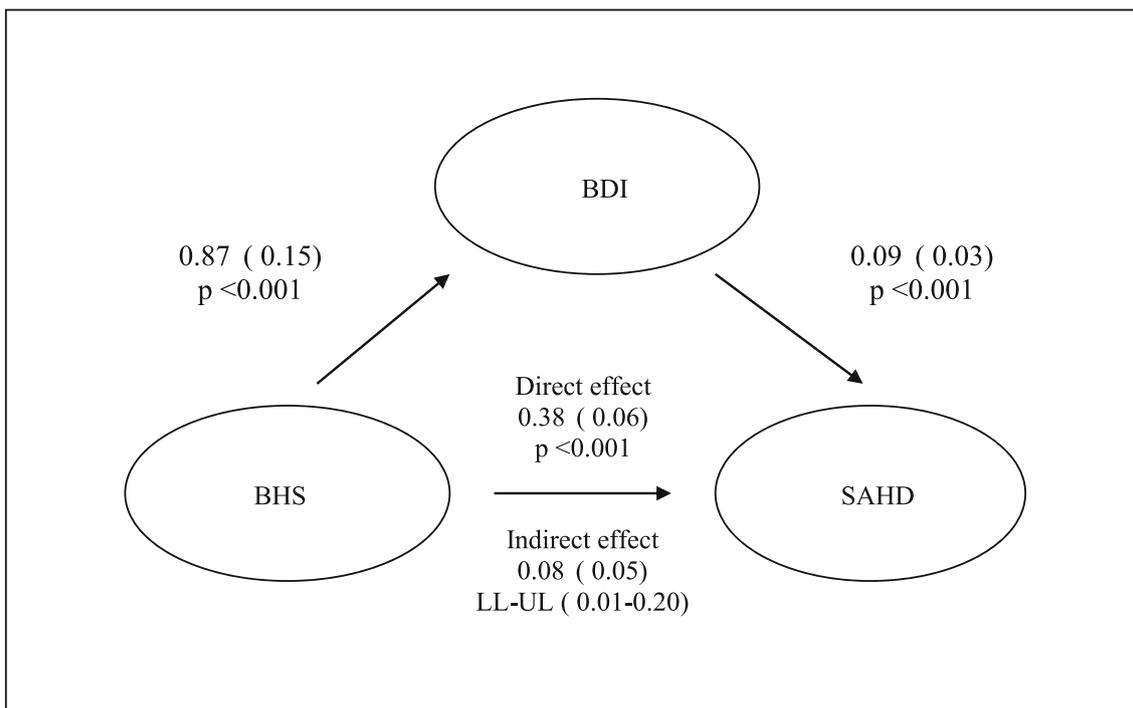
The results in the current study indicated the strong relationship between depression, hopelessness, and desire for hastened death consistent to previous findings [8, 39].

Our findings also suggest that hopelessness might have an important role in patients' desires for hastened death; in addition, depressive symptomatology may strengthen feelings of hopelessness and desires for hastened death

**Table 2** Correlation between depression (BDI), hopelessness (BHS), and desires for hastened death (SAHD)

	BHS	SAHD
BDI	0.553*	0.468*
BHS	–	0.678*
SAHD	–	–

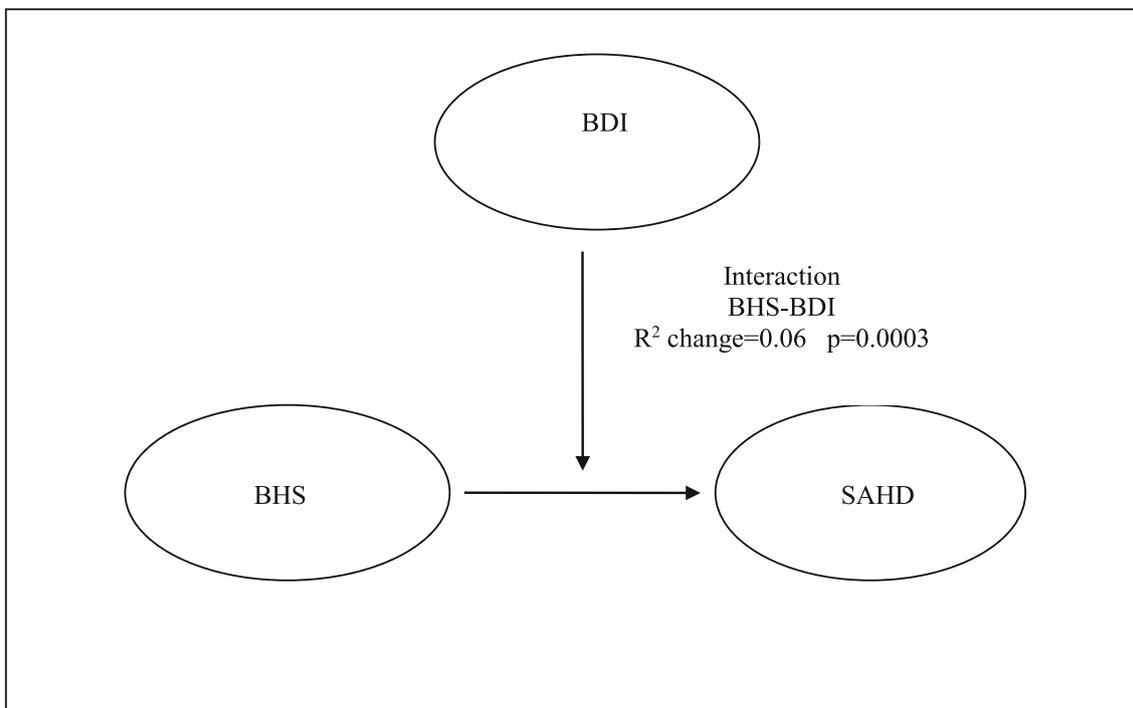
\*All values are presented as Spearman's  $r$  ( $p$  value)



**Fig. 1** Mediation effect of depression (BDI), hopelessness (BHS), and desires for hastened death (SAHD)

consistent to findings of others [10, 40]. It seemed that in advanced stages of cancer progression of the disease, side effects from therapies, dysfunctional thoughts, and death anxiety are some of the main factors contributing to depression and hopelessness [41].

The high correlations between depression, hopelessness, and hastened death as well as the mediation and moderation analyses signifying that occurrence of depression affect their level of hopelessness and patients' with advanced cancer desires for hastened death.



**Fig. 2** Moderation effect of depression (BDI), hopelessness (BHS), and desires for hastened death (SAHD)

Hopelessness was found to influence patients' desires on hastened death similar to other studies [8, 42, 43].

One noteworthy finding in the current study was the role of depression on the relationship between hopelessness with desire for hastened death. Depression seemed to influence and strengthen the relationship of the other two factors consistent to previous findings [42, 43].

The current analysis is important for understanding the relative risk relating to depression in advanced stages of cancer. This is the first attempt to analyze the role of depression as a moderator and/or mediator in the relationship between hopelessness and desires for hastened death. However, in a more recent study with a multiple mediation analyses [44], it seemed that depression and other factors such as loss of meaning, loss of purpose, control, and self-worth might be the mechanisms through which quality of life may influence desires for hastened death.

Additionally, hopelessness and desire for hastened death could have serious impact on unrecognized and untreated depression [14].

There were several limitations of our study; the relationship between the assessed variables has been investigated; however, little is known for the role of depression as a mediator and/or moderator issue on hopelessness and desire for hastened death. Then, subsequent analyses could be interesting investigating other variables such as pain and other sociodemographic characteristics to examine whether these are also risk factors for depression. It is noticeable the fact that Wilson et al.'s study [45] has somehow contradictory results from the current study; this might stem from the fact that diagnostic criteria and interviews with more direct questions have been used vs. screening questionnaires that have been used in our study. Therefore, we discuss on symptomatology and not in specific diagnosis regarding mental disorders.

Hopelessness assessment could be useful for the identification of hidden emotions and unrealistic hopes and expectations [46]. More attention should be focus on the motivations as well as the intentions lie behind patients' desire on hastened death [28]. A combination of psychotherapy and pharmacotherapy could be the appropriate treatment for depressive symptomatology and the loss of hope. Cognitive behavioral therapy using interventions such as relaxation techniques as well as supportive psychotherapy has been shown to decrease psychological distress in advanced stages [47]. Meaning-centered psychotherapy and dignity therapy as novel therapies could be beneficial also for the treatment of depression and hopelessness as well [14].

### Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

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