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**Original Article**

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**Medical Students' Death Anxiety: Severity and Association with Psychological Health and Attitudes Toward Palliative Care**

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## Abstract

**Context.** Death anxiety is related to awareness of the reality of dying and death and can be negatively related to a person's psychological health. Physicians' death anxiety also may influence their care for patients approaching death. Doctors face death in a professional context for the first time at medical school, but knowledge about death anxiety among medical students is limited.

**Objectives.** To examine medical students' death anxiety in relation to: 1) its severity, gender differences and trajectory during medical education, and 2) its associations with students' attitudes towards palliative care and their psychological health.

**Methods.** Four cohorts of core science and four cohorts of clinical students at the University of Cambridge Medical School took part in a questionnaire survey with longitudinal follow-up. Students who provided data on the revised Collett-Lester Fear of Death Scale were included in the analysis ( $N=790$ ).

**Results.** Medical students' death anxiety was moderate, with no gender differences and remained very stable over time. High death anxiety was associated with higher depression and anxiety levels and greater concerns about the personal impact of providing palliative care.

**Conclusion.** The associations between high death anxiety and lower psychological health and negative attitudes towards palliative care are concerning. It is important to address death anxiety during medical education in order to enhance student's psychological health and the quality of their future palliative care provision.

**Key Words:** Death anxiety, medical students, attitudes, palliative care, psychological health.

**Running head:** Death Anxiety in Medical Students

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## Introduction

Medical students and doctors have more frequent and intense contact with death and dying than most in society (1). Such contact may trigger death anxiety (DA) (2), which has been defined as “an unpleasant emotion of multidimensional concerns that is of existential origin, provoked on contemplation of death of self or others” (3). Although health care professionals encounter death and dying frequently (4), failure to deal adequately with their own reactions may affect the quality of care they give to terminally ill patients (1, 5).

Medical students first encounter death in a professional context in the dissecting room, before they start to meet dying patients in clinical contexts. As junior doctors, they frequently encounter patients approaching the end of life (6). Recent years have seen increasing attention being given to palliative care (PC) in medical education (7, 8).

Little is known about the prevalence or trajectory of DA among medical students. Previous studies indicate that: they do not display greater DA than other student populations (9, 10); female medical students report higher DA than male students (11); and DA does not change over the course of medical school experience (1, 12). Much of this literature is now over 20 years old, coming from a period when PC education was much less prevalent in medical schools than at the present time.

DA and attitudes towards death and dying affect the behavior of both medical students and qualified doctors (12). Final year medical students with high DA have been found to be more likely to report difficulties in discussing prognosis with terminally ill patients than those with lower DA (1). DA also may affect medical students themselves (4): high DA has been linked to maladjustment, neurotic symptoms and psychopathology (13). Some studies report medical students to have a higher incidence of psychological distress than other students (14), which may

in part be a result of their exposure to death and dying (15). DA, therefore, may affect the quality of care medical students provide to their future patients either directly or indirectly (16).

Cognitive behavior therapy theory (17) explains the link between emotional reaction and quality of care. Emotions (feelings / mood), cognitions (thoughts / attitudes), and behaviors (actions / physical reactions) influence each other. Encounters with death and dying make people aware of their own mortality (2) and provoke emotional reactions (18) that are shaped by individuals' attitudes (19).

In modern Western society, death has a negative image (3), hence the emotional reaction to death may be DA. Health care professionals who experience intense fear of death may display behavioral responses such as avoidance, procrastination or poorer performance (5, 20) and be less effective in caring for dying patients (21).

Thus, it is important to understand the extent to which medical students display DA, how it develops, and how it influences their attitudes towards the dying and their own psychological health.

### ***Aims***

This paper addresses the following questions: 1) What is the level of DA among medical students?; 2) Do female students report higher DA than male students?; 3) Does DA change during the experiences of medical school?; and 4) Do students with low DA and high DA differ in their attitudes towards PC and their own psychological health?

### **Method**

#### ***Setting and Procedure***

The University of Cambridge School of Medicine comprises an initial core science component (Years 1 - 3) which focuses largely on biomedical sciences with limited clinical

contact, and a clinical component (Years 4 - 6). The annual intake to the core science component is 280 students, typically aged 18, of whom 140 currently progress to the clinical component, others going to schools elsewhere to complete their studies. All students undertake full cadaveric dissection during Year 1. PC teaching and contact with patients near the end of life only occurs during the clinical years 4 - 6.

All students entering both the core science and clinical components were invited to take part in annual questionnaire surveys investigating their characteristics and attitudes (empathy, psychological health, DA, attitudes towards PC and experience of personal bereavement) (22-25). Participation was voluntary, with a small number of prizes awarded annually by lottery. The study was approved by the University of Cambridge Psychology Ethics Committee.

From 2009 onwards, the revised Collett Lester Fear of Death Scale (CLFODS-R) as a DA measure was included. The present paper reports data from 790 students: Year 1 and Year 4 in 2009 and 2010 and Year 3 and Year 6 between 2009 and 2012 (Fig. 1).

### ***Measures***

We examined students' DA using the CLFODS-R, psychological well-being using the Hospital Anxiety and Depression Scale (HADS) and attitudes towards PC using a series of questions developed by Sullivan et al.

The CLFODS-R (26) has four subscales: Death of Self, Dying of Self, Death of Others and Dying of Others (Appendix 1). Each subscale comprises seven statements rated on 5-point Likert scales (1 - 5) in terms of "How disturbed or made anxious" one becomes by it. Subscale scores (range 7 - 35) are summed to the CLFODS-R total score (range 28 - 140), higher scores indicating greater DA. The CLFODS-R has been widely used and demonstrated to have good psychometric characteristics in several cultural contexts (9).

The HADS (27) assesses levels of anxiety (HADS-A) and depression (HADS-D); each comprises seven items rated on 4-point Likert scales (0 - 3) in terms of “How frequently it is experienced”. Scores range between 0 – 21, higher scores indicating greater psychological distress, scores of  $\geq 8$  indicating “potential caseness” for anxiety or depression (28). The HADS is widely used in research, with good psychometric characteristics with patients and the general population (28).

Sullivan et al.’s large scale study of U.S. doctor and medical student PC education (29) included eight statements assessing attitudes towards PC (Appendix 2). Each item is rated on a 5-point Likert scale, higher scores indicating greater agreement; no sum score is calculated. For part of the analysis, binary categories were created: not agree (1 - 3) or agree (4 - 5).

### *Statistical Analysis*

SPSS v. 21 (30) was used for analysis. Missing data rates were less than 1.5% for all measures: the Expectation Maximization Algorithm was applied (31) to estimate missing values of five single CLFODS-R items, and where missing values could not be estimated ( $n = 7$ , when all subscale items were missing or because of the single item nature of the Sullivan questionnaire), a pairwise deletion approach was used. Because of repeated measurements, analyses carried out were based on different datasets, which are specified below.

To describe DA among medical students (question 1), means and standard deviations (SD) of CLFOD-R total scores are reported using all students in Year 1 ( $n = 344$ ), Year 3 ( $n = 374$ ), Year 4 ( $n = 141$ ) and Year 6 ( $n = 247$ ). If several measurements of one student exist only the first one was used.

To test for gender differences in DA and to examine the trajectory of DA (questions 2 and 3), mixed between-within subject analyses of variance (ANOVA) were conducted using

CLFODS-R total score or subscale scores as the dependent variable. Separate analyses were carried out for core science (Years 1–3,  $n = 161$ ) and clinical (Years 4–6,  $n = 90$ ) components. Partial eta squared ( $\eta^2$ ) as effect size is reported. On account of the large number of tests undertaken, a significance level of 1% was used throughout.

To examine the relationships between DA and attitudes towards PC and psychological well-being (question 4), three groups of students were formed. According to their CLFODS-R total score, those students in the upper and lower thirds were designated as “high” (CLFODS-R total score  $\geq 95$ ) and “low” DA (CLFODS-R total score  $\leq 80$ ), respectively.

HADS data were not normally distributed, hence the non-parametric Mann-Whitney  $U$  test was used to examine group differences. The effect size  $r$  and the number of students in each group recording higher HADS scores ( $\geq 8$ ) are reported. Chi-squared tests examined group differences in attitudes towards PC and odds ratios (OR) as effect size are reported. Found associations between DA, HADS and Sullivan’s PC statements were then examined for the whole data set ( $n = 790$ ) using Pearson product-moment and Spearman’s rho correlations.

## Results

Mean response rates were: Year 1, 61%; Year 3, 33%; Year 4, 52%; and Year 6, 46%. Fig. 1 shows participant numbers and gender. DA total scores ranged between 85.0 (Year 4) and 88.4 (Year 1). Participants reported slightly lower DA scores than those of nursing students (32) and psychology students (33) (Fig. 2).

The four subscale scores showed similar orders in all years: Death of Others and Dying of Self scored highest, Dying of Others and Death of Self lowest (Table 1).

Mixed between-within subject ANOVAs investigated gender differences and change over time (Table 1). There were no significant gender differences among either core science or



clinical students in total or subscale scores of the CLFODS-R. No significant main effects of time were found in core science for CLFODS-R total or any subscales. Among clinical students, one significant time effect was found for the Death of Others subscale: Year 6 students approaching the end of the clinical course (mean = 24.5, SD = 4.7) recorded significantly higher scores than those in Year 4 starting the clinical course (mean = 23.0, SD = 4.9) [ $F(1.87) = 7.900$ ,  $P = 0.006$ ,  $\eta^2 = 0.082$ ]. No interaction terms between gender and time were significant; the trajectories of DA over time among male and female students were similar.

Taking these results into account and the stability of students' attitudes towards PC (25) and HADS-D scores (23), data from all students were combined for the remaining analyses. Students with CLFODS-R total score  $\leq 80$  formed the low DA group ( $n=262$ ), and those with CLFODS-R total score  $\geq 95$  formed the high DA group ( $n=280$ ). These two groups differed significantly in their psychological health (Fig. 3). The low DA group had significantly lower scores on HADS-A ( $U = 22195.0$ ,  $P < 0.001$ ,  $r = 0.34$ ) and HADS-D ( $U = 25034.0$ ,  $P < 0.001$ ,  $r = 0.28$ ). In the low DA group, nine (3.4%) and 62 (23.5%) students recorded "potential caseness" scores for depression and anxiety, respectively. In the high DA group, 28 (10%) and 142 (50.7%) students recorded "potential caseness" scores for depression and anxiety, respectively.

Significantly more students with high DA agreed to the three Sullivan statements which express negative attitudes concerning the personal impact of PC (Statements 6 - 8) than those with low DA (Table 2); high DA students were two to five times more likely to agree with these statements. Students with high and low DA did not differ in respect to Sullivan statements reflecting doctor's responsibilities and awareness of the psychological impact of terminal illness (Appendix 3).

Correlation analyses of the whole sample confirmed the high / low DA group comparison results: the CLFODS-R total showed significant positive weak correlations with HADS subscales and Sullivan statements 6 - 8 (Table 3).

## **Discussion**

A modest degree of DA is normal in any thoughtful and sensitive person and both necessary and helpful in medical students and doctors. Extremely low DA would be cause for concern, as it may reflect a casual and cavalier attitude towards life and death issues. Similarly, unduly high DA also would be of concern, given its association with discomfort with PC, avoidance of patients near the end of life and correlation with reduced psychological health.

### ***Summary of Main Findings***

This study provides new information concerning medical student's DA, in particular how it changes during their education and its association with their psychological health and attitudes towards PC. At the start of the course, students had moderate levels of DA on CLFODS-R total and all subscale scores. Levels remained stable throughout the six-year course, with no change during core science and increasing only in one component (death of others) during clinical. There were no significant gender differences either in levels or change in DA over time. Students with higher DA recorded significantly higher anxiety and depression scores and were significantly more likely to agree that providing PC would have negative personal impacts.

### ***Comparison with the Literature***

The full range of CLFODS-R is 28 to 140 with a midpoint of 84; the students' mean score range of 85.0 to 88.4 indicated moderate levels of DA. Studies of other students have reported mean scores above 90: nursing (92.5 and 95.5) (32, 34), psychology (94.9) (33) and a general student population (93.7) (35). In line with our results, others studies have found lower

DA among medical students than other students (5, 10), therefore contradicting the hypothesis that health care professionals choose their work in part to address their unusually high levels of DA (36). The ranking of subscales was similar in all years and in line with other studies: students feared the Death of Others and Dying of Self more than, Dying of Others and Death of Self (32, 34).

The lack of gender difference in DA contrasts with studies that have reported higher DA among women than men (37-39). One medical student study reported no gender difference (40) and two others reported higher levels of DA among women medical students (10, 11). From the outset, Cambridge medical students and in particular women had lower DA than general students of comparable age (35). The high academic entry criteria and knowledge that the course involves full body dissection might lead particular students to apply.

While anatomy or PC teaching have been found to have short-term effects on DA (11, 32, 41, 42), other studies have found DA to be stable over the duration of medical school, as in the present study (43). During the core science years, the limited patient contact and absence of PC teaching may lead to few events and experiences influencing DA.

The lack of change in DA during clinical years was notable. Students have frequent clinical contact with patients approaching the end of life and regular PC teaching. Clinical experience of death and dying increases students' DA (2), whereas PC teaching reduces DA, at least in the short term (32); from the increase in fear of the death of others during clinical, it appears that the former outweighs the latter.

High and low DA groups did not differ in their attitudes towards doctors' responsibilities to provide palliative or bereavement care, nor attitudes towards the psychological impact of terminal illness on patients. But students with high DA were significantly more likely to have

negative attitudes towards the personal impacts of providing PC. High DA leads health care professionals to distance themselves from death and dying (44) and to provide poorer quality PC (45). This study suggests that this may, in part, result from a desire to protect themselves from the perceived personal impact of caring for patients approaching the end of life.

There was an inverse (AU: IS INVERSE CORRECT?) relationship between DA and medical students' psychological health: those with high DA had significantly greater self-rated measures of anxiety and depression. This is consistent with the wider literature that demonstrates a negative impact of DA on psychological health (13), anxiety (4, 46) and depression (46, 47) and with one early medical student study that found DA to be negatively related to psychological well-being. (48)

### ***Strengths and Weaknesses.***

This is one of the largest studies to date to investigate DA among medical students and is novel in examining a multidimensional measure of DA in a longitudinal design. To our knowledge, this is also the first study to investigate the link between DA and attitudes towards PC. The response rates achieved were good for studies of this nature. The instruments have been widely used and validated in previous studies and have strong psychometric properties. The CLFODS-R is particularly valuable in being a multidimensional measure of DA. It is acknowledged that the study is limited by coming from a single institution with higher academic entry criteria than some U.K. medical schools. The preclinical / clinical course divide, while unusual in the U.K., is a more common course structure in the U.S. and other countries. Although it is acknowledged that many other factors such as culture and religious orientation may influence DA, such factors were outside the remit granted by the Ethics Committee.

### ***Implications for Medical School Teaching***

Issues of death and dying become more salient when students become junior doctors; they cease to be observers and become providers of care with responsibility for talking with and caring for patients approaching the end of life, verifying death, completing certificates and talking with bereaved relatives. Therefore, it is important to address DA during medical school, although its stability appears to make it difficult to change. Students could be encouraged to become aware of their own DA and reflect on its potential implications for their patients and their own well-being. Comprehensive PC teaching, clinical encounters with patients who are carefully debriefed by teaching faculty, and development of reflective practice are all useful in this regard.

### ***Future Research***

It is important to validate our findings in other institutions with different entry criteria and course structures.. A prospective study of the same students during their training assessing DA before and after critical events (e.g., dissection course) would be of interest. How DA changes on qualification and during the early years of medical practice also needs to be addressed.

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*Appendix 1*  
*Revised Collett-Lester Fear of Death Scale (26)*

**How disturbed or made anxious are you by: Your own death**

The total isolation of death  
 The shortness of life  
 Missing out on so much after you die  
 Dying young  
 How it will feel to be dead  
 Never thinking or experiencing anything again  
 The disintegration of your body after you die

**How disturbed or made anxious are you by: Your own dying**

The physical degeneration involved  
 The pain involved in dying  
 The intellectual degeneration of old age  
 That your abilities will be limited as you lay dying  
 The uncertainty as to how bravely you will face the process of dying  
 Your lack of control over the process of dying  
 The possibility of dying in a hospital away from friends and family

**How disturbed or made anxious are you by: The death of others**

Losing someone close to you  
 Having to see the person's dead body  
 Never being able to communicate with the person again  
 Regret over not being nicer to the person when they were alive  
 Growing old alone without the person

**How disturbed or made anxious are you by: The death of others**

Feeling guilty that you are relieved that the person is dead  
 Feeling lonely without the person

**How disturbed or made anxious are you by: The Dying of Others**

Having to be with someone who is dying

Having the person want to talk about death with you

Watching the person suffer from pain

Seeing the physical degeneration of the person's body

Not knowing what to do about your grief at losing the person when you are with them

Watching the deterioration of the person's mental abilities

Being reminded that you are going to go through the experience also one day

**AU: DO YOU NEED PERMISSION TO USE THIS?**

*Appendix 2**Sullivan Statements: Attitudes Towards End-of-Life-Care (29)***The doctor's responsibility**

S1.Doctors<sup>a</sup> have a responsibility to help patients at the end of life prepare for death.

S4.Doctors<sup>a</sup> have a responsibility to provide bereavement care to the patient's family members after death.

**Psychological aspects**

S2.Psychological suffering can be as severe as physical suffering.

S3.Depression is treatable among patients with terminal illnesses.

S5.It is possible to tell patients the truth about a terminal prognosis and still maintain hope.

**Personal impact**

S6.Caring for dying patients is depressing

S7.I dread having to deal with the emotional distress of family members of a patient at the end of life.

S8.I think that I may feel guilty after the death of a patient I am caring for.<sup>b</sup>

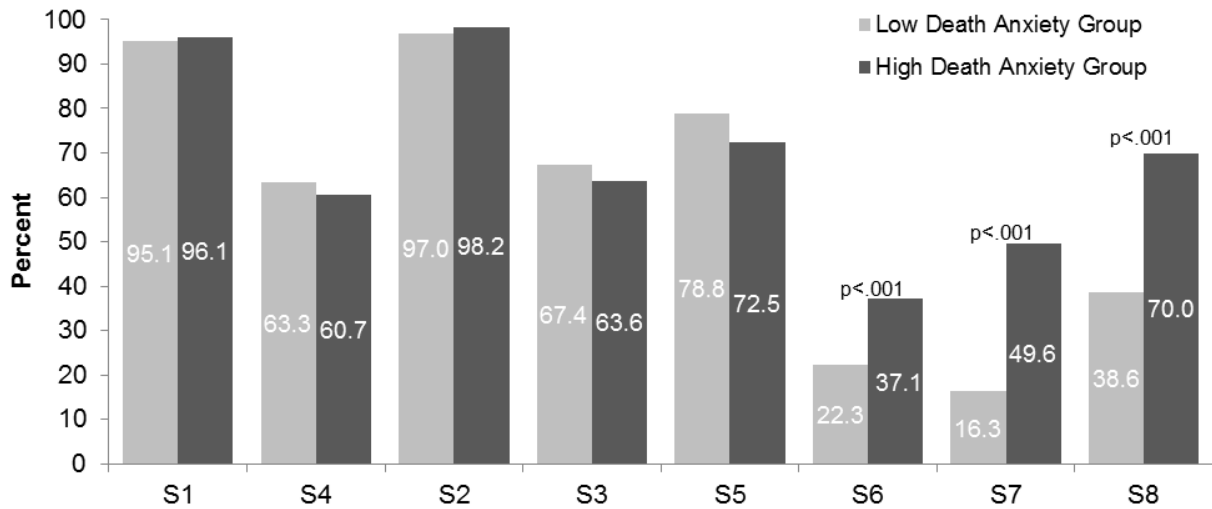
Minor wording adaptations for the U.K. medical student population:

<sup>a</sup> Original U.S. wording: Physicians.

<sup>b</sup> Original U.S. wording: I feel guilty after a death.

**AU : DO YOU NEED PERMISSION TO USE THIS ?**

**Appendix 3**  
**Percent of Respondents Who Agreed with the Eight Sullivan Statements**

**Key:****The doctor's responsibility**

S1. Doctors have a responsibility to help patients at the end of life prepare for death

S4. Doctors have a responsibility to provide bereavement care to the patient's family members after

**Psychological aspects**

S2. Psychological suffering can be as severe as physical suffering

S3. Depression is treatable among patients with terminal illnesses

S5. It is possible to tell patients the truth about a terminal prognosis and still maintain

**Personal impact**

S6. Caring for dying patients is depressing

S7. I dread having to deal with the emotional distress of family members of a patient at the end of life

S8. I think that I may feel guilty after the death of a patient I am caring for

Table 1

Longitudinal Dataset: Means (standard deviation) of CLFODS-R total and subscale scores.

	Year 1			Year 3			Year 4			Year 6		
	all	m	f	all	m	F	all	m	f	all	m	f
	n=161	n=74	n=87	n=161	n=74	n=87	n=90	n=46	n=44	n=90	n=46	n=44
<b>CLFODS-R</b>	87.5 (17.9)	85.0 (19.2)	89.6 (16.5)	86.6 (17.6)	83.5 (19.4)	89.3 (15.5)	81.7 (17.2)	82.4 (17.8)	81.1 (16.8)	84.2 (17.0)	86.0 (15.2)	82.4 (18.7)
<b>My Death</b>	17.3 (7.0)	16.6 (6.9)	18.0 (7.1)	16.7 (6.1)	16.6 (6.0)	16.8 (6.2)	15.1 (5.9)	15.4 (6.3)	14.7 (5.5)	15.5 (5.8)	16.5 (6.0)	14.5 (5.3)
<b>My Dying</b>	24.0 (5.7)	23.5 (6.4)	24.4 (5.1)	24.1 (6.0)	22.6 (6.6)	25.3 (5.2)	23.0 (5.7)	23.3 (5.5)	22.7 (5.9)	23.9 (6.1)	24.6 (5.4)	23.1 (6.8)
<b>Others' Death</b>	24.9 (5.0)	24.0 (5.0)	25.6 (4.8)	24.4 (5.1)	23.4 (5.3)	25.2 (4.7)	23.0 <sup>a</sup> (4.9)	22.7 (5.2)	23.2 (4.6)	24.5 <sup>a</sup> (4.7)	24.2 (4.2)	24.8 (5.3)
<b>Others' Dying</b>	21.6 (5.4)	21.3 (5.9)	21.9 (4.9)	21.5 (5.2)	20.9 (5.8)	22.0 (4.6)	20.7 (4.4)	20.9 (4.4)	20.4 (4.4)	20.4 (4.4)	20.7 (3.9)	20.0 (4.8)

m = male, f = female.

CLFODS-R: revised Collett Lester Fear of Death Scale.

<sup>a</sup> Means in the same row that share a superscript differ  $p < .01$ .

Table 2

**Agreement to Sullivan statements 6-8 expressed in numbers (percentage) among high and low death anxiety (DA) groups (n = 542)**

	Low DA (n=262)	High DA (n=280)	Chi-square test		
			$X^2(1, N=542)$	<i>p</i>	OR
S6 Caring for dying patients is depressing	59 (22.5%)	104 (37.1%)	13.76	<.001	2.0
S7 I dread having to deal with emotional distress of family members	43 (16.4%)	139 (49.6%)	67.01	<.001	5.0
S8 I may feel guilty after the death of a patient I am caring for	102 (38.9%)	196 (70.0%)	52.78	<.001	3.6



Table 3

**Correlations between CLFODS-R total scores, HADS subscales and Sullivan statements 6-8 (N = 790)**

	HADS-A <sup>a</sup>	HADS-D <sup>b</sup>	S6 <sup>b</sup>	S7 <sup>b</sup>	S8 <sup>b</sup>
CLFODS-R	.35**	.26**	.16**	.31**	.26**

CLFODS-R= revised Collett Lester Fear of Death Scale total score, HADS-A = Hospital Anxiety and Depression Scale - Anxiety Scale, HADS-D = Hospital Anxiety and Depression Scale - Depression Scale.

S6 = Caring for dying patients is depressing

S7 = I dread having to deal with emotional distress of family members

S8 = I may feel guilty after the death of a patient I am caring for

<sup>a</sup>Pearson's  $r$ , <sup>b</sup>Spearman's  $\rho$ .

\*\*  $p < .001$ .

## Death Anxiety among Medical Students

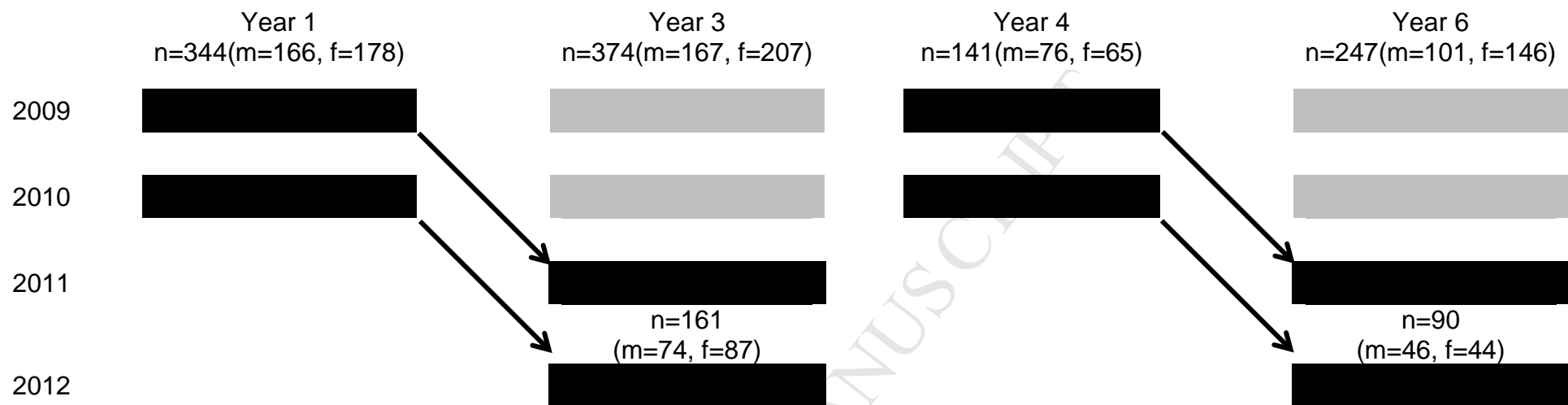


Fig. 1. Participants.

Boxes in black indicate year groups for whom longitudinal data were available

Boxes in grey indicate year groups for whom only cross-sectional data were available.

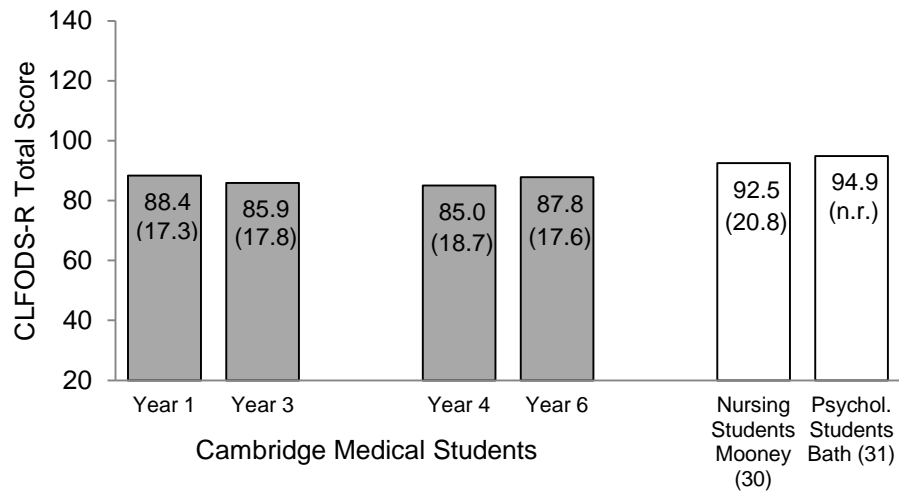


Fig. 2. Severity of death anxiety of medical students, compared with nursing and psychology students, means (standard deviation).

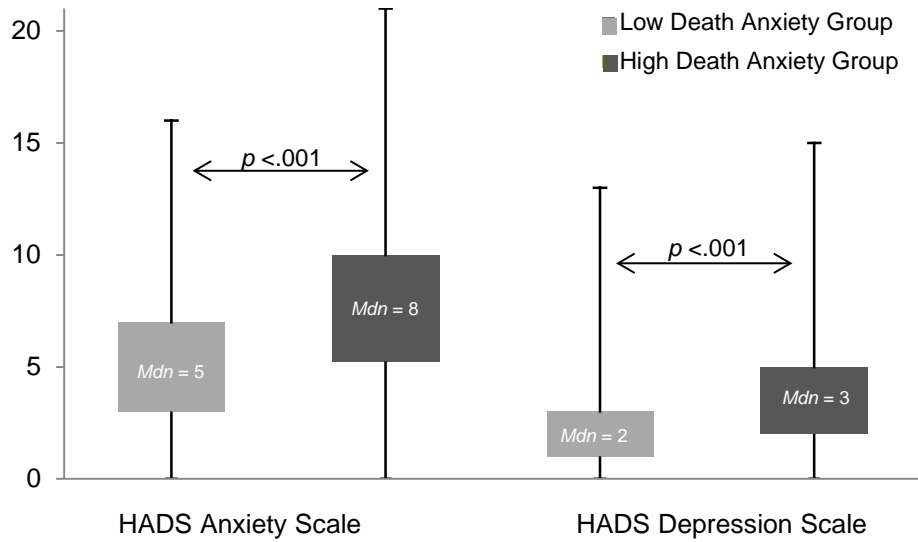


Fig. 3. Distributions of anxiety and depression scores among low and high death anxiety groups.

HADS = Hospital Anxiety and Depression Scale.