Multidimensional Study of the Attitude Towards Euthanasia of Older Adults with Mixed Anxiety-Depressive Disorder

Luis Fonseca *, Luísa Castro, Guilhermina Rêgo, Rui Nunes

Posted Date: 10 April 2024

doi: 10.20944/preprints202404.0671.v1

Keywords: depression; anxiety; elderly; euthanasia

 doi:10.20944/preprints202404.0671.v1

Article

Multidimensional Study of the Attitude Towards Euthanasia of Older Adults with Mixed Anxiety-Depressive Disorder

Luís Fonseca [1,2], Luísa Castro [3,4], Guilhermina Rego [1] and Rui Nunes [1]

[1] Bioethics Department, Faculty of Medicine, University of Porto, Portugal; guilherminarego@med.up.pt; ruinunes@med.up.pt
[2] Psychogeriatrics Unity, Psychiatry Department, Senhora da Oliveira Hospital Guimarães, Portugal
[3] Department of community medicine, Information and Health decisions Sciences. MEDICIS, Faculty of Medicine, University of Porto, Portugal; luisacastro@med.up.pt
[4] Centre for Health Technology and Services Research (RISE/CINTESIS), Faculty of Medicine, University of Porto, Portugal
* Correspondence: luisoliveirafonseca@gmail.com; Address: Al. Prof. Hernâni Monteiro, 4200 - 319 Porto, Portugal, Phone number: 00351964404281

Abstract: Introduction: This study aims to verify if elderly patients with mixed anxiety-depressive disorder are more prone to euthanasia and identify factors that interfere with their satisfaction with health and capacity for well-informed decisions. Material and Methods: The study applied a paper questionnaire composed of a sociodemographic section and a battery of scales (to assess depression, anxiety, cognitive performance, suicide risk, therapeutic adhesion, functionality, loneliness, attitude towards euthanasia, decision pattern, personality, empathy and health status) in the Psychogeriatric Unity of Senhora da Oliveira Hospital in Portugal. The sample was collected by convenience to include patients and controls of the same age. Six months later, a reassessment was done. Patients and controls were compared using descriptive statistics and a multiple-regression model. Results: A total of 114 patients and 25 controls were included. Eighty-one point six per cent of patients had four or fewer years of schooling. Contrary to controls, they presented mild depressive and anxiety symptoms, loneliness feelings, worse cognitive performance, a more fragile personality, higher personal distress and a poorer health state. No statistically significant differences were found between controls and patients regarding their attitudes towards euthanasia. Patients more favourable to euthanasia had higher empathic concern, conscientiousness and fantasy and lower personal distress. Discussion and Conclusion: When addressing euthanasia in these patients, it is crucial to ensure they are fully self-determinate and that all the necessary treatment and support are available. It may not be the case when the educational level is low and mild disease persists, significantly affecting their well-being and cognitive performance.

Keywords: depression; anxiety; elderly; euthanasia

Introduction

Demographic winter is a reality worldwide. By 2050, the number of people aged 60 and older will double, and the number of persons aged 80 years or older is expected to triple. [1] In the European Union (E.U.), according to data from January 2022, older people (aged 65 or over) were around 21.1 % of the total population, with Italy (23.8 %), Portugal (23.7 %), Finland (23.1 %), Greece (22.7 %) and Croatia (22.5 %) being the most aged countries. [2]

Between 2018 and 2080, according to a central projection scenario, the ageing rate in Portugal will almost double, from 159 to 300 older adults for every 100 young people. [3]

The demographic turnover will have a tremendous impact on several areas of our societies, [4] including mental health, as it is known that advanced age represents a risk factor for depression and anxiety in midlife and older adults. [5] Thereby, it cannot be surprising that mental illness, particularly depressive and anxiety disorders, are not only currently among the top ten leading causes of global burden, [6] as this is expected to increase. The burden of a disease is calculated using

 doi:10.20944/preprints202404.0671.v1

the disability-adjusted life year (DALY). In Portugal, Alzheimer's and other dementias, Depression and Anxiety disorders appear in the fifth, sixth and ninth position, respectively, of the ten top causes of DALY. [7] The estimated prevalence of anxiety among Portuguese older adults is 9.6%, and depression is 11.8%. [8] Age, [9] depression [10] and anxiety [11] are all known risk factors for dementia. Consequently, as ageing becomes more prominent, more elderly will suffer from dementia, depression and anxiety.

In addition, the Portuguese elderly present specific frailties that will add to the problem, namely a low educational and literacy level [12] and loneliness. Sixty-eight point five per cent of people aged 65 or over have between zero and four years of schooling [13] and the number of people living alone has been increasing, with the number of single-person families consisting of an older adult representing the majority of these families. [14] Low education and illiteracy have been correlated with anxiety and depressive symptoms [8] and a higher risk of dementia, [15,16] mainly when years of education reflect cognitive capacity. [17] Also, loneliness has been linked with an increased risk of developing depression, [18] anxiety [19] and dementia. [20] One study even associated a higher cortical amount of amyloid with loneliness in cognitively normal elderly individuals. [21]

Several risk factors for anxiety and depression in older adults have been identified (e.g. personality traits, poor self-perceived health), augmenting the complexity of the demanded treatments. [22] Furthermore, there are also specific regional-related differences that increase the probability of suffering from depression and anxiety. Southern European countries have more socioeconomic inequality and more late-life depression than Northern European countries, and this relationship was not mitigated by more significant individual income. [23]

Thus, considering the negative impact of the demographic winter on the elderly mental health, it is of the utmost importance to discuss and study in advance euthanasia in this population, particularly when a growing number of countries are legalising it. [24,25]

Several studies found that numerous factors relate to attitude towards euthanasia, such as religion, [26] empathic skills, [27,28] personality, [29–31] disease type and severity [32,33], loneliness [34] and educational level and other psycho and socioeconomic variables. [29] Also, suicide risk and euthanasia have been approached, but no relation was found between the two phenomena. [35]. However, all these findings have been complex to compare across studies because of the variety of sample characteristics and outcome measures. [29,30,36] Human beings are complex, and several determinants affect their personal beliefs and decision-making. [37,38] As such, it is of the utmost importance to do exhaustive comparative studies involving older adults with psychiatric disorders that include objective assessments of several of those determinants, mimicking, the best as possible, the complexity of humans' beliefs and decision-making processes when euthanasia is considered.

Herein, we present a multidimensional study of the attitude towards euthanasia of Portuguese elderly with mixed depression and anxiety disorder. The aim is to verify if these patients are more prone to euthanasia and identify specific needs and weaknesses that may interfere with their satisfaction with health and capacity for well-informed decisions. If studied and discussed beforehand, tailored euthanasia legislation can be elaborated and targeted prevention and treatment strategies implemented to increase the well-being and the decision-making capacity of older adults with mental health disorders.

Material and Methods

This study involved applying a paper questionnaire both in the community and in the Psychogeriatric Unit (P.U.) of the Psychiatry Department (P.D.) of Senhora da Oliveira Hospital (SOH) in Portugal. The questionnaire comprised a sociodemographic section and a battery of scales validated for Portuguese. The participants always filled out the questionnaire with a researcher available. If any doubts occurred, they were promptly clarified.

After the proper approval by the Ethics Committee of the SOH (ref. 70/2020), the sample was collected in the consultation of the PU between May 7th, 2021, and November 30th, 2022, to include older patients (aged≥ 65) with mixed anxiety-depression disorder (ICD-10), stable co-morbidities (if present) and medicated in accordance to the presented symptoms and international guidelines (13th

 doi:10.20944/preprints202404.0671.v1

Edition of the Maudsley Prescribing Guidelines in Psychiatry). Patients with depressive and anxiety symptoms secondary to non-psychiatric illness, chronic pain and dementia were omitted. Also, controls of the same age were collected by convenience from the consultation of the PU (where healthy companions of the patients were asked to participate voluntarily) and the community. Six months later, a reassessment using the same instruments was done. Patients and controls were compared using descriptive statistics and a multiple-regression model.

The purpose of the use of the several following instruments was to analyse which of the factors or combination of them most influence the attitudes towards euthanasia of the participants, given the various determinants that operate in humans' personal beliefs and decision-making processes, as stated previously.

The hospital anxiety and depression scale (HADS) comprises seven questions for anxiety and seven questions for depression, and cut-off scores are available for quantification (8 – 10: mild symptoms; 11 – 14: moderate symptoms; 15 – 21: severe symptoms). Instrument [39] was validated for Portuguese (α: anxiety = .76, depression = .81) [40] and revealed a Cronbach's Alpha in our sample of .889 for anxiety and .847 for depression.

UCLA loneliness scale (UCLAs) is a 16-item scale designed to measure one's subjective feelings of loneliness. Participants rate each item as either "I often feel this way", "I sometimes feel this way", "I rarely feel this way", or "I never feel this way". Scores > 32 indicate feelings of loneliness. UCLAs [41] were validated for Portuguese (α = .905) [42]. Our sample presents a Cronbach's Alpha of .953.

Treatment adherence was assessed using the Measure Treatment Adherence (MTA) scale. This scale is an instrument composed of seven items that assess an individual's behaviour about the everyday use of medicines. The answers are obtained by an ordinal six-point scale ranging from 'always' (1 point) to 'never' (6 points). The values obtained from the responses to the seven items are added and divided by the number of items. Higher values mean higher levels of adherence. The scale is validated for Portuguese (α = .74) [43] and the Cronbach's Alpha in our sample was .831.

Barthel index (B.I.) is an ordinal scale that measures functional independence in personal care and mobility. [44] The 10-item version is the most used. The scoring method considers whether the person receives help while doing each task. The scores for each of the items [0, 5), (0, 5, 10) or (0, 5, 10, 15) depending on the item] are summed to create a total score, with higher scores indicating higher levels of independence. It is validated for Portuguese (α = .622) [45]. The Cronbach's Alpha in our sample was .622.

Yara's attitude towards euthanasia scale (YATEs) was validated with eight samples and applied in research studies with highly satisfactory results. [26,46,47] It assesses the overall tendency of a specific group regarding euthanasia and allows comparisons between groups. Scores range from 0 to 104. Higher scores indicate a more favourable attitude towards euthanasia. The sample median divides those with a more favourable attitude from those with a less favourable attitude. It was recently validated for Portuguese (α = .934) [48]. The Cronbach's Alpha in our sample was .983.

Wasserman's (2005) attitude towards euthanasia scale (WATEs) is a 10-item scale which measures attitudes towards euthanasia, considering different dimensions: severe pain, the impossibility of recovery, patient's request, physician's authority, active euthanasia, and passive euthanasia. The subjects answer to each one using the Likert scale response categories of 1) strongly disagree, 2) disagree, 3) undecided, 4) agree, and 5) strongly agree. The scale's internal consistency in the original study was measured by a Cronbach's Alpha of .87. [49] The internal consistency of the Portuguese version was good (Cronbach's Alpha = .90). [50] Cronbach's Alpha was also analysed for two dimensions, "Decision/Will of the Patient" and "Decision/Evaluation of the Physician", revealing a high internal consistency with values of .94 and .85, respectively. [50] In our sample, wATEs presented high internal consistency for both the total scale (α = .98) and its two dimensions ("Patient's Decision/Will": α = .97, and "Doctor's Decision/Evaluation": α = .98)

The Melbourne Decision-Making Questionnaire [(MDMQ) was designed to assess how individuals approach decision situations. [51] It includes five subscales to which the respondent checks "True for me" (score 2), "Sometimes true" (score 1) or "Not true for me" (score 0). Each scale ranges from zero to 10 (procrastination and hypervigilance) or 12 (vigilance, self-esteem and buck-

 doi:10.20944/preprints202404.0671.v1

passing). It is validated for Portuguese [α (self-esteem) = .76; α (vigilance) = .747, α (buck passing) = .859, α (hypervigilance) = .782, α (procrastination) = .793] [52]. In our sample, Cronbach's alpha was .838 for self-esteem, .911 for vigilance, .936 for buck passing, .833 for procrastination and .812 for hypervigilance.

The NEO Five-Factor Inventory (NEO-FFI) concisely measures five personality factors (Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness), with 12 items for each factor. [53] Each of the items is measured on a Likert-based scale ranging from 0 ("Strongly Disagree") to 4 ("Strongly Agree"). Higher scores in each domain indicate a higher impact of that particular personality trait. The Portuguese version of NEO-FFI revealed good reliability with Cronbach's Alpha values (Conscientiousness=.81, Neuroticism = .81, Extraversion = .75, Agreeableness = .72, and Openness = .71) related to the ones reported for the original NEO-FFI in the USA. [54] In our sample, the Portuguese NEO-FFI also presented high internal consistency in four of its five dimensions: Conscientiousness=.848, Neuroticism = .934, Extraversion = .859, Agreeableness = .618, and Openness = .862.

The interpersonal reactivity index (IRI) is based on a multidimensional view of empathy and comprises four sub-scales: perspective taking, empathic concern, personal discomfort and fantasy. [55] For each statement/item of the IRI, a person is asked to indicate to what extent that statement applies to self, using a 5-level scale (between "Does not describe me well" and "Describes me very well" using the numbers 0 and 4, respectively, and 1, 2, 3 for intermediate evaluations). The quotation is made by adding these values by sub-scale and averaging them. Higher scores indicate a higher capacity, use, or intensity of the respective component of empathy. The Cronbach's' alpha of the IRI scale in the Portuguese version (perspective taking = .74; empathic concern = .77; personal discomfort = .81; fantasy = .83) was moderate and similar to those found with the other versions of IRI. [56] In our sample, IRI presented the following Cronbach's' alpha: perspective taking = .936; empathic concern = .838; personal discomfort = .919; fantasy = .870.

Short form health survey - version 2 (SF36v2) is a patient-reported outcome assessment designed to measure patients' quality of life, functional health and well-being across various conditions. It covers eight health domains: physical function, physical role, pain, general health, vitality, social function, emotional role and mental health. [57] It was validated for Portuguese [58,59] presenting the following Cronbach's' alpha: α (physical function) = .8731; α (physical role) = .7511; α (pain) = .8441; α (general health) = .8745; α (vitality) = .8264; α (social function) = .6031; α (emotional role) = 0.7104; α (mental health) = 0.6446. In our sample, Cronbach's' alpha were: α (physical function) = .920; α (physical role) = .964; α (pain) = .833; α (general health) = .821; α (vitality) = .859; α (social function) = .844; α (emotional role) = 0.945; α (mental health) = 0.937.

Tool for assessment of suicide risk (TASR) has been designed to be used by clinicians to document a summary of their assessment of a patient who may be suicidal. The TASR is divided into three sections: individual profile, symptom profile and interview profile. The TASR is a 'bedside' tool that helps the clinician determine the 'burden of risk' for suicide. [60] Points are used to provide the clinician with a section weighing suicide risk. Section 1 is assigned a weighing of one point for each item, section 2, two points, and section 3, three points. The greater the number of points, the greater the level of suicide risk. The tool's developers provided no psychometric properties or indication of its validity in assessing suicide risk. Nevertheless, we decided to use it here to have a concrete and brief measure of the suicide risk and to verify if it relates to a specific attitude towards euthanasia.

Mini-mental-state [61,62] and clock-drawing test [63,64] are two brief tests that assess an individual's cognitive performance and are closely related to one's education level. [65,66]. In our patient's sample, the correlations between Schooling/ Mini-mental-state (MMS) and Schooling/ clock-drawing test (CDT) were significant and positive [Schooling/MMS: $r(112) = .48$ ($p<0.001$); Schooling/CDT: $r(112) = .56$ ($p<0.001$)], showing that even slight differences in the years of education can have a significant impact on one's cognitive abilities. In the MMS, Portuguese normative values considered were: possible cognitive decline if MMS ≤22 for subjects from 1 to 11 years of education, ≤27 for those with 11 years of education, and ≤15 for illiterate. The CDT used a 10-point quantitative

 doi:10.20944/preprints202404.0671.v1

system encompassing three major clock components. The selected time setting was "11:10", as recommended by several authors. [67,68] Scores ≤ 6 were considered abnormal.

Statistical Analysis

Analyses were performed using the statistical software package SPSS Statistics (v. 28.0; SPSS ® Inc., Chicago, Illinois, United States) and Jamovi 1.1.9.0 (datalab. CC, Sydney, Australia). The categorical variables were described by absolute and relative frequencies, n (%). The normality of quantitative variables was evaluated by visual inspection of the respective histograms. The quantitative variables presented deviations from the normal distribution and were described by median and interquartile interval, Med [1stQ, 3rdQ]. Correlations were calculated using the Spearman correlation coefficient, r. Values of $p \leq 0.05$ were considered significant.

A multiple regression analysis was performed in the patient's sample to verify which variables were associated with the attitude towards euthanasia (outcome). First, all the relevant variables were tested in simple linear regression models for the outcome. Then, all variables significant at the $p < 0.2$ level in the simple models were included in an initial multiple model. The final model was obtained by successively eliminating the independent variables with the highest p-value until only variables significant at the 0.05 level remained. The results of linear regressions are presented with non-standardised coefficient values (B), 95% confidence intervals (95% CI), and p-values. Multiple models were evaluated using the F statistics, p-values, and coefficients of determination (R2). All final models complied with the adequate assumptions: normally distributed residuals, no multicollinearity and homoscedasticity.

RESULTS

Descriptive Analysis

One hundred and fourteen patients and twenty-five controls participated in the study at baseline, and ninety patients and seventeen controls six months later. Dropouts were voluntary and for no other reason than not wanting to participate further.

At baseline, patients (P) and controls (C) were of the same age (P-mean=73.01; C-mean=71.84) and most were married (P-60.5%; C-84%), catholic (P-97.4%; C-92%), retired (P-98.2%; C-100%), with a household of two (P-44.7%; C-68%) and had four years of schooling (P-61.4%; C-40%). Seventy-six per cent of patients were female, and 56% of controls were male (Table 1). Psychometric assessment (Table 2) showed that both patients and controls had good therapeutic adherence (MAT: patients – med = 5.86; controls – med = 6; p=1) and were independent for daily life activities (BI: patients – med=100; controls -med=100; p=1). In addition, several statistically significant differences between controls and patients were found. Patients revealed mild depressive and anxiety symptoms (HADS - p<0.001), loneliness feelings (UCLALs – p=0.001), worse cognitive performance (MMS/CDT - p<0.001), a more fragile and dysfunctional personality [more neurotic (p<0.001) and less extroverted (p<0.001), open (p<0.008) and conscientious (p=0.017) on NEO-FFI], higher personal distress (IRI personal distress=p<0.001) and worse health state [(worse physical functioning (p<0.001), physical role (p<0.001), general health (p<0.001), vitality (p<0.001), social function (p<0.001), emotional role (p<0.001) and mental health (p<0.001) on SF36-v2]. Patients' reassessment six months later (Table 4.) revealed an improvement in depressive and anxiety symptoms (HADS - p<0.001), better cognitive performance (MMS/CDT - p<0.001), fewer loneliness feelings (UCLALs - p<0.001) and a better physical role (p=0.010), social function (p=0.007), emotional role (p=0.001) and mental health (p<0.001). However, the differences between controls and patients remained the same, except for conscientiousness (Table 2).

Table 1. CHARACTERISATION OF THE SAMPLE OF PATIENTS (N=114) AND CONTROLS (N=25).

	Patients (n=114)	Controls (n=25)
Gender, n (%)		

 doi:10.20944/preprints202404.0671.v1

Female	87 (76.3)	11 (44)
Male	27 (23.7)	14 (56)
Age (years), mean±sd, min-max	73.01 ± 5.319, 65-91	71.84 ± 3.287, 66-78
Years of school, n (%)		
0	7 (6.1)	0 (0)
1	2 (1.8)	0 (0)
2	1 (0.9)	0 (0)
3	13 (11.4)	1 (4)
4	70 (61.4)	10 (40)
5	0 (0)	1 (4)
6	5 (4.4)	1 (4)
7	1 (0.9)	1 (4)
8	1 (0.9)	1 (4)
9	3 (2.6)	1 (4)
11	2 (1.8)	0 (0)
12	4 (3.5)	3 (12)
15	2 (1.8)	2 (8)
16	1 (0.9)	0 (0)
17	2 (1.8)	4 (16)
Civil status, n (%)		
Married	69 (60.5)	21 (84)
Divorced	12 (10.5)	1 (4)
Single	7 (6.1)	0 (0)
Widow	26 (22.8)	3 (12)
Religion, n (%)		
Catholic	111 (97.4)	23 (92)
Jehovah witness	2 (1.8)	0 (0)
Agnostic	1 (0.9)	2 (8)
Profession, n (%)		
Self-employed	1 (0.9)	0 (0)
Manager	1 (0.9)	0 (0)
Retired	112 (98.2)	25 (100)
Household, n (%)		
1	27 (23.7)	3 (12)
2	51 (44.7)	17 (68)
3	25 (21.9)	2 (8)
4	7 (6.1)	1 (4)
5	2 (1.8)	2 (8)
6	1 (0.9)	0 (0)
11	1 (0.9)	0 (0)
sd: standard deviation		

Table 2. SCALES DESCRIPTIVES OF PATIENTS (N=114) AND CONTROLS (N=25).

 doi:10.20944/preprints202404.0671.v1

	Baseline			Six months later		
Scales	**Patients (n=114)**	**Controls (n=25)**	***Mann-Whitney's p-value with Bonferroni correction for multiple testing (33 tests)****	**Patients (n=90)**	**Controls (n=17)**	***Mann-Whitney's p-value with Bonferroni correction for multiple testing (33 tests)****
	med (IIQ), min-max	med (IIQ), min-max		med (IIQ), min-max	med (IIQ), min-max	
HADS Depression (8 – 10: mild symptoms)	9 (6; 10), 0 -15	1 (0; 2), 0 -5	**<0.001**	8 (3; 9), 0 -14	1 (0.5; 2), 0 -3	**<0.001**
HADS Anxiety (8 – 10: mild symptoms)	8 (5; 10), 1 -19	1 (0.5; 2), 0 -4	**<0.001**	7 (3; 9), 2 -14	1 (0; 2), 0 - 2	**<0.001**
MMS	28 (26; 29), 11 -30	30 (29; 30), 25 -30	**<0.001**	28,5 (27; 30), 15 -30	30 (30;30), 28 -30	**0.001**
CDT	9 (7; 9.5), 1 -10	10 (9.5; 10), 5 -10	**<0.001**	9,25 (7,9; 9,5), 1 -10	10 (9,5; 10), 9 -10	**0.002**
UCLAs	36.5 (20; 46), 16 -64	22 (17; 27.5), 16 - 31	**0.001**	33 (20; 41,3), 16 - 60	19 (16.5; 22.5), 16 - 25	**0.007**
MAT	5.86 (5.25; 6), 3.71-6	6 (5.4; 6), 5-6	1	5.86 (5.43; 6), 3.71-6	5.86 (5.57; 6), 5.29-6	1
BI	100 (100; 100), 70 - 100	100 (100; 100), 100 - 100	1	100 (100; 100), 75 - 100	100 (100; 100), 100 - 100	1
YATEs	83.5 (51.5; 95.25), 3 - 104	52 (30; 80.5), 2 - 103	0.288	86 (41; 97,5), 3 - 104	55 (23,5; 80,5), 0 - 103	0.590
WATEs (patient's decision/will)	4 (2.75; 4.75), 1 -5	3.25 (2.25; 4), 1 -5	1	4 (2,4; 4,5), 1 -5	4 (2; 4), 1 - 5	1
WATEs (Doctor's decision/assessment)	2.75 (1.5; 3.875), 1 -5	2 (1.5; 2.5), 1 -4	0.612	2,33 (1,7; 3,6), 1 -5	2 (2; 2), 1 - 3	1
MDMQ						
Self-esteem (max = 12)	8 (5; 10), 1-12	10 (8; 11), 6-12	**<0.001**	8 (5,8; 10), 1 -12	11 (8;11,5), 6 – 12	0.315
Vigilance (max = 12)	10 (6; 12), 0-12	12 (10; 12), 2 -12	1	11 (8; 12), 0 -12	12 (10; 12), 3 -12	1
Buck Passing (max = 12)	6 (2; 11), 0-12	3 (1.5; 6), 0 -12	0.514	5 (2; 10), 0 -12	4 (1; 7), 0 - 9	1

 doi:10.20944/preprints202404.0671.v1

Procrastination (max = 10)	3 (1; 6.25), 0-10	3 (1; 4), 0 -9	1	3 (1; 6), 0 -10	3 (1; 4.5), 0 -9	1
Hypervigilance (max = 10)	6 (3.75; 8), 0-10	4 (2; 5), 0 - 10	0.144	5,5 (3; 8), 0 -10	4 (3; 5,5), 0 -7	1
NEO-FFI						
Neuroticism	31 (20; 36.25); 2-47	16 (12; 19.5), 4 -28	**<0.001**	28,5 (18; 34), 4 -41	14 (13; 20), 11 -25	**<0.001**
Extraversion	19.5 (16; 25.25), 8-44	31 (26; 33), 17 -36	**<0.001**	20,5 (17; 26), 9 -39	29 (26,5; 33), 20 -36	**<0.001**
Openness	12 (7; 19), 3-39	23 (18.5; 27.5), 6 -33	**<0.001**	14 (10; 19), 3 -35	23 (18,5; 26,5), 14 - 35	**<0.001**
Agreeableness	33 (30; 35), 18-41	33 (29.5; 36.5), 20 - 41	1	32,5 (30; 34), 19 -38	33 (30; 34,5), 24 - 36	1
Conscientiousness	33.5 (31; 36), 4-46	36 (34; 39.5), 31 - 45	**0.016**	34 (31; 36), 12 -39	36 (35; 37,5), 28 - 41	0.064
IRI						
Perspective Taking	3.17 (2; 3.67), 0.5-4	2.5 (1.5; 3.3), 1 -4	1	3,17 (1,7; 3,8), 0 -4	1,67 (1,17;3,34), 1 – 3,83	1
Empathic Concern	3.33 (2.63; 3.83), 1.3-4	3.2 (2.4; 3.6), 1.5 -4	1	3,42 (2,8; 3,8), 1,7 -4	2,83 (2,50;3,25), 1,67 – 3,83	1
Personal Distress	2.83 (1.83; 3.33), 0-4.2	1.7 (0.8; 2.3), 0 -3	**<0.001**	2,75 (2; 3,3), 0,5 -4	1,5 (1;2,09), 0,33 – 2,67	**<0.001**
Fantasy	1.5 (0.67; 2.33), 0-3.7	1.7 (1.2; 2.3), 0.3 - 3.3	1	1,5 (0,5; 2,2), 0 -3,7	1,5 (1,09;1,67), 0,50 – 3,33	1
SF36v2						
physical functioning	90 (65; 95), 10-100	95 (92.5; 100), 60 - 100	**<0.001**	90 (70; 90), 10 -95	95 (90; 95), 50 -100	**0.005**
physical role	93.75 (62.5; 100), 12.5-100	100 (100; 100), 75 - 100	**0.012**	100 (75; 100), 6,3 - 100	100 (100; 100), 100 - 100	**0.026**
pain	74 (62; 84), 0-100	84 (62; 100), 51 - 100	1	84 (62; 100), 12 - 100	84 (74; 100), 62 - 100	1

 doi:10.20944/preprints202404.0671.v1

general health	38.5 (30; 50), 15-95	67 (51; 73.5), 35 - 100	**<0.001**	37,5 (28,8; 52), 10 -87	67 (56; 74,5), 30 - 95	**<0.001**
vitality	37.5 (25; 62.5), 6.25-93.75	75 (71.9; 81.3), 56.25 -93.75	**<0.001**	43,75 (31,3; 56,3), 0 - 87,5	75 (69; 81), 69 -100	**<0.001**
social function	50 (25; 87.5), 0-100	100 (81.3; 100), 62.5 - 100	**<0.001**	62,5 (25; 90,6), 0 - 100	100 (100; 100), 75 - 100	**<0.001**
emotional role	75 (50; 100), 0-100	100 (100; 100), 83.33 -100	**<0.001**	91,67 (58,3; 100), 25 - 100	100 (100; 100), 100 - 100	**0.003**
mental health	50 (35; 70), 5-100	90 (80; 90), 65 -100	**<0.001**	67,5 (50; 85), 15 -95	90 (85; 90), 55 -100	**0.003**
TARS	7 (4; 10), 2-18	3 (2; 3), 2-8	**<0.001**	5,5 (3; 7), 3 -16	3 (2; 3), 2 - 3	**<0.001**

min-minimum; max-maximum; med-median; IIQ – interquartile range [1ºQ;3ºQ]; * Mann-Whitney test bilateral p-value; bold: significant p-values (p<0.05).

HADS: hospital anxiety and depression scale; MMS: mini-mental-state; CDT: clock drawing test; UCLALs: UCLA loneliness scale; MARS: medication adherence rating scale; B.I.: Barthel index; YATEs: Yara attitude towards euthanasia scale; WATEs: Wasserman attitude towards euthanasia scale; MDMQ: Melbourne decision-making questionnaire; NEO-FFI: NEO five-factor inventory; SF36-v2: short-form health survey - version 2; IRI: interpersonal reactivity index; TASR – tool for assessment of suicide risk.

No differences were found between controls and patients regarding the attitudes towards euthanasia, as measured by euthanasia YATEs and WATEs.

Patients tendentially more favourable to euthanasia presented higher perspective-taking capacity, empathic concern, fantasy, openness, agreeableness, conscientiousness, and vigilance and lower personal distress, buck-passing, procrastination, and hypervigilance (Table 3). Controls more favourable to euthanasia presented higher perspective-taking capacity, empathic concern, and lower procrastination (Table 3).

Table 3. SPEARMAN CORRELATIONS OF YATES WITH UCLALS, HADS, IRI, NEO-FFI, MDMQ, SF36-V2 AND TASR IN BOTH PATIENTS' (N=114) AND CONTROLS' (N=25) SAMPLE.

	Correlation with YATEs	
Scales and Subscales	**Patients**	**Controls**
UCLA	-0.181	0.159
HADS Depression	-0.100	0.280
HADS Anxiety	-0.084	0.297
IRI Perspective taking	**0.758****	**0.803****
IRI Empathic concern	**0.325****	**0.668****
IRI Personal distress	**-0.200***	-0.128

 doi:10.20944/preprints202404.0671.v1

IRI Fantasy	**0.378****	0.368
NEO-FFI Neuroticism	-0.167	0.021
NEO-FFI Extroversion	0.101	0.011
NEO-FFI Openness	**0.232***	0.012
NEO-FFI Agreeableness	**0.223***	0.188
NEO-FFI Conscientiousness	**0.293****	-0.114
MDMQ Self-esteem	**0.302****	0.260
MDMQ **Vigilance**	**0.276****	0.179
MDMQ Buck passing	**-0.280****	-0.384
MDMQ **Procrastination**	**-0.371****	**-0.415***
MDMQ **Hypervigilance**	**-0.344****	-0.375
SF36v2 **P**hysical functioning	0.163	-0.227
SF36v2 Physical role	0.086	0.180
SF36v2 Pain	0.007	-0.329
SF36v2 General health	-0.060	-0.177
SF36v2 Vitality	0.116	-0.132
SF36v2 Social function	0.128	-0.050
SF36v2 Emotional role	0.089	0.172
SF36v2 Mental health	0.087	-0.149
TASR	-0.124	-0.146

bold: significant p-values (***p < 0.05; ****p < 0.01**)

HADS: hospital anxiety and depression scale; MMS: mini-mental-state; CDT: clock drawing test; UCLALs: UCLA loneliness scale; MARS: medication adherence rating scale; B.I.: Barthel index; YATEs: Yara attitude towards euthanasia scale; WATEs: Wasserman attitude towards euthanasia scale; MDMQ: Melbourne decision-making questionnaire; NEO-FFI: NEO five-factor inventory; SF36-v2: short-form health survey - version 2; IRI: interpersonal reactivity index; TASR – tool for assessment of suicide risk.

Multiple Regression Analysis of the Patient's Sample

All the significant variables ($p<0.2$) in the simple model (table 3) were included in the initial multiple regression model (Table 5).

Since some independent variables were highly correlated [corr (self-esteem; vigilance) = 0.803, corr (self-esteem; buck-passing) = - 0.754, corr (procrastination; buck-passing) = 0.757, corr (buck-passing; hypervigilance) = 0.781 and corr (procrastination; hypervigilance) = 0.824], three were eliminated (self-esteem, procrastination and hypervigilance). Thus, only vigilance and buck-passing were included in the multiple model.

The multiple model was obtained progressively, eliminating the non-significant ($p<0.05$) variables. The only significant variable in the final model was perspective-taking, which alone explained around 65.7% of the variability of YATEs. For each point of the sub-scale perspective-taking, YATEs increased an average of twenty-six points. This happened because perspective-taking was highly correlated with the outcome (YATEs, r=83%). A decision was then made to exclude this variable from the final model.

In the end, the significant associations with a favourable attitude towards euthanasia in the patients' sample were higher conscientiousness, empathic concern and fantasy and lower personal distress (Table 5.).

Discussion

Portugal recently legalised euthanasia for people with a fatal disease and unbearable suffering. [69] It will be a matter of time before the subject will be addressed for psychiatric disorders. Therefore, it is of the utmost importance to discuss and understand several issues surrounding mental illnesses of the most vulnerable segments of the Portuguese population, like older adults.

Euthanasia of psychiatric patients is not only about whether they are competent and self-determined to make such a request. Many are undoubtedly able to do so. [70],[71] In our study, patients have shown to be independent in daily life activities [B.I. mean, controls/patients (baseline and six months later) = 100; p=1]. However, they had worse cognitive performance, more neuroticism, and less extraversion and openness at baseline and six months later (see MMS, CDT and NEO-FFI in Table 2.). In addition, people lose much of their autonomy when they grow old and fragile, being increasingly inclined or forced to leave decisions to others. [72] Decision-making competence is linked to several individual characteristics, such as personality [73,74] and individual cognitive abilities [75]; mild cognitive impairment is associated with poorer decision-making. [76] Thus, it is doubtful whether, under certain conditions, older adults retain their total decision-making capacity for free and informed consent in health. Several Portuguese elderly who have four years of schooling or less (in our study, 81.6% of patients and 44% of controls had four or fewer years of education) have minimal reading or writing skills, with some only knowing how to sign their name and many not being able to perform 'simple' digital tasks (e.g., handling a smart-phone or texting). Therefore, there are cognitive limitations that may not be only the result of a mental illness but also of a poor socio-cultural and academic background. [77] This adds to the problem of the negative influence of depressive and anxiety symptoms on cognitive performance.

As shown in Table 2. the presence of mild mental illness (HADS scores) is sufficient to determine feelings of loneliness (despite most patients – 76,3% - living in a household of two or more people), lower self-esteem, worse cognitive performance, personal distress and health satisfaction and higher suicide risk. Now, in countries where euthanasia is available for psychiatric patients claiming unbearable mental suffering, the legalisation was based on the assumption that there is no clinical or legal argument to consider physical suffering worse than mental suffering. [78,79] Hence, if intolerable mental anguish is advocated, the proper and legally established assessment for euthanasia can be initiated. However, two significant problems arise here. First, the quantification of "unbearable" mental suffering poses more incredible difficulty in comparison to "unbearable" physical suffering, [80–82] leaving more space for subjectivity in the assessment and potentiating some arbitrariness regarding which cases are allowed or not. Imagine that a patient from our study, suffering from mild depression and anxiety, claimed unbearable suffering. Would euthanasia be admissible? Despite psychiatrists being well-trained doctors, there is a heterogeneity in mental health assessment [83] that can lead two psychiatrists to classify differently the severity of the same patient's disorder. Secondly, in many cases, patients may not be offered or subjected to all the necessary treatments. [84] In Mental Health, therapies are holistic and go far beyond biological treatments. [85] Nevertheless, in daily clinical practice, and despite the recommendations of several official guidelines, the failure to respond to biological therapies is too often the only criterion to consider a psychiatric disorder refractory to treatment. [86] This is particularly important in older people, where psychosocial issues and ageing-related problems arise, increasing the need for non-pharmacological approaches. [71,87] In our study, six months after the first evaluation, upon psychiatric follow-up, there was an improvement in depressive and anxiety symptoms, leading to better cognitive performance, social function, and mental health and fewer feelings of loneliness (Table 4). However, this follow-up, with a medical-centered approach (psychopharmacology and brief counselling), was insufficient for a full recovery as the differences between patients and controls remained the same (Table 2.).

Table 4. DESCRIPTIVES AND SCALES COMPARISON OF PATIENTS BETWEEN THE BASELINE (N=114) AND SIX MONTHS LATER (N=90).

		Wilcoxon's

 doi:10.20944/preprints202404.0671.v1

Scales	baseline, med (IIQ), min-max	Six months later, med (IIQ), min-max	*p-value with Bonferroni correction for multiple testing (14 tests)*
HADS Depression	9 (6; 10), 0 -15	8 (3; 9), 0 -14	**<0.001**
HADS Anxiety	8 (5,8; 10), 1 -19	7 (3; 9), 2 -14	**<0.001**
MMS	28 (26; 29), 11 - 30	28,5 (27; 30), 15 -30	**<0.001**
CDT	9 (6,9; 9,5), 1 - 10	9,25 (7,9; 9,5), 1 - 10	1
UCLA loneliness scale	36 (20; 45), 16 - 62	33 (20; 41,3), 16 -60	**<0.001**
MAT	5.86 (5.25; 6), 3.71-6	5.86 (5.43; 6), 3.71-6	**1**
SF36v2 Physical functioning	90 (65; 95), 10 - 100	90 (70; 90), 10 - 95	1
SF36v2 Physical role	100 (67,2; 100), 12,5 -100	100 (75; 100), 6,3 -100	**0.010**
SF36v2 Pain	74 (62; 91), 0 - 100	84 (62; 100), 12 -100	0.238
SF36v2 General health	38,5 (25; 50,5), 15 -87	37,5 (28,8; 52), 10 - 87	1
SF36v2 Vitality	37,5 (25; 62,5), 6,25 - 93,75	43,75 (31,3; 56,3), 0 -87,5	1

 doi:10.20944/preprints202404.0671.v1

SF36v2 Social function	56,2 (25; 87,5), 0 - 100	62,5 (25; 90,6), 0 -100		**0.007**
SF36v2 Emotional role	75 (50; 100), 0 - 100	91,67 (58,3; 100), 25 -100		**0.001**
SF36v2 Mental health	50 (35; 70), 5 - 100	67,5 (50; 85), 15 -95		**<0.001**

med-median; IIQ – interquartile range [1ºQ;3ºQ]; min-minimum; max-maximum; bold: significant p-values (p<0.05).

HADS: hospital anxiety and depression scale; MMS: mini-mental-state; CDT: clock drawing test; UCLALs: UCLA loneliness scale; MARS: medication adherence rating scale; B.I.; SF36-v2: short-form health survey - version 2.

Table 5. NON-STANDARDISED REGRESSION COEFFICIENTS (WITH CONFIDENCE INTERVAL AND P VALUE) OF MULTIPLE LINEAR REGRESSION HAVING YATES AS THE DEPENDENT VARIABLE FOR PATIENTS' SAMPLE (N=114).

Independent variables	**Simple Linear Regression Model**		**Initial Multiple Model R[2]=0.362 F(16,97)=3.44, p <0.001**		**Final Multiple Model R^2=0.325 F(4,109)=13.1, p<0.001**	
	B [I.C. a 95%]	**p-value**	**B [I.C. a 95%]**	**p-value**	**B [I.C. a 95%]**	**p-value**
Age	-1.21 [-2.34; -0.08]	**0.035**	-0.33 [-1.56;0.90]	0.598		
Gender						
Female	*Reference*					
Male	7.32 [-6.93; 21.6]	0.311				
Schooling (in years)	1.62 [-0.17; 3.42]	0.076	0.13 [-2.03; 2.29]	0.904		
HADS Depression	-0.54 [-3.45; 0.38]	0.114	-1.19 [-3.93; 1.55]	0.390		
HADS Anxiety	-0.83 [-2.47; 0.81]	0.318				
MDMQ Self-esteem	3.98 [1.97; 6.00]	**<0.001**				
MDMQ Vigilance	2.47 [0.80; 4.13]	**0.004**	0.57 [-1.59; 2.73]	0.601		
MDMQ Buck passing	-2.14 [-3.48; -0.80]	**0.002**	-0.18 [-2.13; 1.77]	0.857		
MDMQ Procrastination	-3.90 [-5.69; -2.10]	**<0.001**				
MDMQ Hypervigilance	-4.22 [-6.32; -2.13]	**<0.001**				
NEO-FFI Neuroticism	-0.54 [-1.14; 0.06]	**0.079**	0.29 [-0.87; 1.46]	0.618		

 doi:10.20944/preprints202404.0671.v1

NEO-FFI Extraversion	0.48 [-0.39; 1.35]	0.276				
NEO-FFI Openness	0.90 [0.14; 1.66]	**0.020**	0.15 [-0.82; 1.12]	0.762		
NEO-FFI Agreeableness	1.60 [0.20; 2.99]	**0.025**	-0.35 [-1.87; 1.17]	0.652		
NEO-FFI Conscientiousness	2.15 [1.22; 3.09]	**<0.001**	1.65 [0.50; 2.81]	0.005	**1.65 [0.77; 2.54]**	**<0.001**
IRI Perspective taking	25.92 [22.3; 29.51]	**<0.001**				
IRI Empathic concern	15.7 [7.26; 24.2]	**<0.001**	15.79 [6.46; 25.13]	0.001	**14.32 [6.19; 22.46]**	**<0.001**
IRI Personal distress	-6.89 [-13.1; -0.67]	**0.030**	-3.21 [-11.16; 4.74]	0.425	**-6.01 [-11.78; -0.25]**	**0.041**
IRI Fantasy	11.3 [5.62; 16.9]	**<0.001**	5.54 [-1.41; 12.48]	0.117	**6.51 [1.15; 11.86]**	**0.018**
UCLA	-0.37 [-0.80; 0.06]	**0.089**	-0.47 [-1.09; 0.16]	0.145		
SF36v2 Physical functioning	0.25 [-0.02; 0.52]	**0.069**	0.11 [-0.41; 0.57]	0.748		
SF36v2 Physical role	0.10 [-0.13; 0.33]	0.406				
SF36v2 Pain	0.09 [-0.19; 0.38]	0.515				
SF36v2 General health	-0.08 [-0.44; 0.28]	0.645				
SF36v2 Vitality	0.20 [-0.08; 0.47]	**0.159**	0.08 [-0.41; 0.57]	0.748		
SF36v2 Social function	0.15 [-0.04; 0.34]	**0.122**	-0.25 [-0.57; 0.08]	0.133		
SF36v2 Emotional role	0.13 [-0.09; 0.36]	0.234				
SF36v2 Mental health	0.11 [-0.12; 0.38]	0.296				

bold: significant p-values (p<0.05)

HADS: hospital anxiety and depression scale; UCLALs: UCLA loneliness scale; YATEs: Yara attitude towards euthanasia scale; MDMQ: Melbourne decision-making questionnaire; NEO-FFI: NEO five-factor inventory; SF36-v2: short-form health survey - version 2; IRI: interpersonal reactivity index.

Unlike other medical disciplines, where it is easier to establish analytical criteria for evaluation, diagnosis and intervention, psychiatry is a grey area. That is, diseases (for which there are no biological markers), from a longitudinal perspective, are often dynamic in their nature and intensity. [88] Furthermore, there is significant individual variability about diseases' aetiology and perpetuating factors and the needs of each patient include complex and tailored bio-psycho-social interventions. In the elderly, a clinically and socially idiosyncratic age group, physiological weaknesses and social losses accumulate, and the chronological proximity to death becomes progressively more self-aware. In addition, can it be said that patients who refuse specific treatments (56% of Dutch patients who received physician-assisted death due to psychiatric suffering did refuse some therapy) suffer irremediably? [89] Older adults are particularly prone to the tiredness of life argument for requesting

 doi:10.20944/preprints202404.0671.v1

euthanasia without sufficient medical grounds for their suffering to be legally granted. [90] However, data show that the willingness to die without severe disease is often ambiguous and does not necessarily represent a genuine wish to die. [91] As the experience of the countries where euthanasia is available for people with mental illness shows us, psychiatric patients are increasingly seeking access to euthanasia. [92] Curiously, several patients do not complete the process, indicating that the formal request for medically assisted death is a way of getting attention and help. [93]

Moreover, the stigma that hangs over mental illness can alienate patients, particularly older adults, depriving them of adequate support. This is congruent with our data, where no significant difference was found between patients and controls regarding their attitude towards euthanasia (Table 2.). Despite the higher suicide risk, the disease does not determine a specific attitude towards euthanasia in these elderly patients, even when time passes and mild symptoms prevail. However, this persistent symptomatology, along with loneliness feelings and health dissatisfaction [as opposed to controls (Table 2.)], may lead patients who may not have had access to the necessary holistic treatment to ask for euthanasia.

Finally, despite depressive and anxiety symptoms and loneliness feelings not appearing to determine a specific tendency towards euthanasia (Table 2), several factors are more related to a favourable attitude. Patients with higher perspective-taking, empathic concern, fantasy, openness, agreeableness, consciousness, self-esteem and vigilance and lower personal distress, buck-passing, procrastination and hypervigilance tend to be more favourable to euthanasia (Table 3). In controls, only higher perspective-taking, empathic concern and lower procrastination correlated significantly with YATEs (Table 3). This is congruent with some studies where some of these variables, more or less consistently, have been associated with the same tendency [e.g. empathy [27,28] and personality traits [29,30]]. However, none of these studies either analysed attitudes towards euthanasia in elderly patients with mixed anxiety-depression disorder, nor did it objectively use several psychometric instruments, trying to mimic humans' complexity. Because human beings are multidimensional and several traits, health conditions, and social factors influence their thoughts, opinions and actions, a regression model was done in our study and higher conscientiousness, empathic concern and fantasy and lower personal distress were identified as the variables that better explained a favourable patients' attitude towards euthanasia. This might mean that patients with persistent depressive and anxiety symptoms, feelings of loneliness, precarious health status and higher suicide risk as compared to controls when endowed with higher conscientiousness (which is related to enhanced cognitive abilities [94]), empathic concern and fantasy (that measures an individual's tendency to imagine themself in fictional situations and is associated with empathic accuracy [95]) and lower distress are more aware of their precarious situation and more inclined to consider euthanasia as a viable way out. Stimulating older people's literacy and cognitive abilities is crucial, augmenting their autonomy and informed decision capacity. However, one must remember that it is crucial to put all the necessary support (clinical, psychosocial, and economic) at their disposal to correspond to those higher demands. Otherwise, a sense of dissatisfaction could be nurtured, and euthanasia perceived as a fast, unique and painless solution.

Some limitations should be noticed in our study. First, large samples are advised to reduce measurement errors and produce generalisable results for the same population. Second, the participants' low literacy levels might have difficulty accurately interpreting the statements and questions of the psychometric instruments used, producing results bias. Third, longitudinal assessment should be interpreted cautiously as the number of participants, particularly controls, decreased, diminishing the power of the statistical analysis. Thus, this study should be replicated with larger samples. A comparative analysis of elderly patients with severe disease and younger patients should be done to confirm our results and measure the impact of the severity of the illness and age, respectively, on the attitudes towards euthanasia of those age groups.

Some important considerations can be retrieved from our analysis. First, even mild depressive and anxiety symptoms negatively impact patients' well-being, being related to loneliness feelings, worse cognitive performance, personal distress and poorer health status. Second, the factors that most influenced a favourable attitude towards euthanasia of patients were related to personality

 doi:10.20944/preprints202404.0671.v1

traits, cognitive abilities and empathic capacity (higher conscientiousness, empathic concern and fantasy) and lower personal distress (Table. 5) rather than depressive and anxiety symptoms (suggesting that, at least for this severity level, the disease does not determine a specific attitude). Finally, the low educational level, together with depressive and anxiety symptoms, might harm patients' clairvoyance, determine poorer literacy, make access to information and health services harder and interfere with their capacity to make well-informed and free decisions, favouring a paternalistic approach.

Conclusion

The challenge when addressing euthanasia in elderly patients with mixed anxiety-depressive disorder is not only whether they are fully self-determinate to request euthanasia but also if a timely and proper diagnosis, treatment and support were at their disposal and implemented. Enhancing these patients' sense of satisfaction and usefulness in a production-oriented society that tends to devalue and alienate them is essential. Suppose non-fatal disabilities whose unbearable suffering is either questionable and/or derived from the absence of proper psychiatric, psychosocial and economic support become a generally accepted criterion for granting euthanasia. In that case, human rights can be put at stake.

Conflicts of Interest: The authors have no conflicts of interest to disclose.

Authors' roles: Luís Fonseca (research, statistics, writing, and revision), Luísa Castro (research, statistics, and revision), Guilhermina Rêgo (research and revision), and Rui Nunes (research and revision).

References

1. World Health Organization: WHO. Ageing and health. Published October 1, 2022. https://www.who.int/news-room/fact-sheets/detail/ageing-and-health
2. Population structure and ageing. Eurostat. Published May 16, 2023. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Population_structure_and_ageing
3. Projeções de População Residente. Statistics Portugal. Published March 31, 2020. https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_destaques&DESTAQUESdest_boui=406534255&DESTAQUESmodo=2&xlang=pt
4. Ismail Z, Ahmad WIW, Hamjah SH, Astina IK. The Impact of Population Ageing: A review. *Iranian Journal of Public Health.* Published online December 6, 2021. doi:10.18502/ijph.v50i12.7927
5. Gao X, Geng T, Jiang M, et al. Accelerated biological aging and risk of depression and anxiety: evidence from 424,299 UK Biobank participants. *Nature Communications*. 2023;14(1). doi:10.1038/s41467-023-38013-7
6. Global, regional, and national burden of 12 mental disorders in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet Psychiatry*. 2022;9(2):137-150. doi:10.1016/s2215-0366(21)00395-3
7. Global health estimates: Leading causes of DALYs. https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/global-health-estimates-leading-causes-of-dalys
8. De Sousa RD, Rodrigues AM, Gregório MJ, et al. Anxiety and depression in the Portuguese older adults: prevalence and associated factors. *Frontiers in Medicine*. 2017;4. doi:10.3389/fmed.2017.00196
9. Chen J, Lin KP, Chen Y. Risk factors for dementia. *Journal of the Formosan Medical Association*. 2009;108(10):754-764. doi:10.1016/s0929-6646(09)60402-2
10. Gao Y, Huang C, Zhao K, et al. Retracted: Depression as a risk factor for dementia and mild cognitive impairment: a meta-analysis of longitudinal studies. *International Journal of Geriatric Psychiatry*. 2012;28(5):441-449. doi:10.1002/gps.3845
11. Santabárbara J, López-Antón R, De La Cámara C, et al. Clinically significant anxiety as a risk factor for dementia in the elderly community. *Acta Psychiatrica Scandinavica*. 2018;139(1):6-14. doi:10.1111/acps.12966
12. Costa A, Feteira-Santos R, Alarcão V, et al. Health Literacy among Older Adults in Portugal and Associated Sociodemographic, Health and Healthcare-Related Factors. *International Journal of Environmental Research and Public Health*. 2023;20(5):4172. doi:10.3390/ijerph20054172
13. População residente com 16 a 64 anos e 65 a 89 anos: por nível de escolaridade completo mais elevado (%). Statistics Portugal/PORDATA. Published February 10, 2023. https://www.pordata.pt/portugal/populacao+residente+com+16+a+64+anos+e+65+a+89+anos+por+nivel+de+escolaridade+completo+mais+elevado+(percentagem)-2266

14. *Censos 2011*. Statistics Portugal. Published November 20, 2012. https://censos.ine.pt/xportal/xmain?xpid=CENSOS&xpgid=ine_censos_indicador&contexto=ind&indOcorrCod=0006304&selTab=tab10
15. Brucki SMD. Illiteracy and dementia. *Dementia & Neuropsychologia*. 2010;4(3):153-157. doi:10.1590/s1980-57642010dn40300002
16. Maccora J, Peters R, Anstey KJ. What does (low) education mean in terms of dementia risk? A systematic review and meta-analysis highlighting inconsistency in measuring and operationalising education. *SSM-Population Health*. 2020;12:100654. doi:10.1016/j.ssmph.2020.100654
17. Sharp E, Gatz M. Relationship between education and dementia. *Alzheimer Disease & Associated Disorders*. 2011;25(4):289-304. doi:10.1097/wad.0b013e318211c83c
18. Erzen E, Çıkrıkçı Ö. The effect of loneliness on depression: A meta-analysis. *International Journal of Social Psychiatry*. 2018;64(5):427-435. doi:10.1177/0020764018776349
19. Owczarek M, Nolan E, Shevlin M, et al. How is loneliness related to anxiety and depression: A population-based network analysis in the early lockdown period. *International Journal of Psychology*. 2022;57(5):585-596. doi:10.1002/ijop.12851
20. Sundström A, Adolfsson AN, Nordin M, Adolfsson R. Loneliness increases the risk of All-Cause dementia and Alzheimer's disease. *The Journals of Gerontology: Series B*. 2019;75(5):919-926. doi:10.1093/geronb/gbz139
21. Donovan NJ, Okereke OI, Vannini P, et al. Association of higher cortical amyloid burden with loneliness in cognitively normal older adults. *JAMA Psychiatry*. 2016;73(12):1230. doi:10.1001/jamapsychiatry.2016.2657
22. Vink D, Aartsen M, Schoevers RA. Risk factors for anxiety and depression in the elderly: A review. *Journal of Affective Disorders*. 2008;106(1-2):29-44. doi:10.1016/j.jad.2007.06.005
23. Ladin K, Daniels N, Kawachi I. Exploring the relationship between absolute and relative position and Late-Life Depression: evidence from 10 European countries. *The Gerontologist*. 2009;50(1):48-59. doi:10.1093/geront/gnp065
24. Dyer O, White C, Rada AG. Assisted dying: law and practice around the world. *The BMJ*. Published online August 19, 2015:h4481. doi:10.1136/bmj.h4481
25. Steck N, Egger M, Maessen M, Reisch T, Zwahlen M. Euthanasia and assisted suicide in selected European countries and U.S. states. *Medical Care*. 2013;51(10):938-944. doi:10.1097/mlr.0b013e3182a0f427
26. Faria, Y. *Relação entre atitude sobre eutanásia e crenças religiosas*. Col:8875 | com:8874. 1986. https://bibliotecadigital.fgv.br/dspace/handle/10438/8928
27. Avci E. The goals of Medicine and Compassion in the ethical Assessment of Euthanasia and Physician-Assisted Suicide: Relieving pain and suffering by protecting, promoting, and maintaining the person's Well-Being. *Journal of Palliative Care*. 2022;37(3):366-371. doi:10.1177/08258597221078371
28. Van Tol DG, Rietjens J, Van Der Heide A. Empathy and the application of the 'unbearable suffering' criterion in Dutch euthanasia practice. *Health Policy*. 2012;105(2-3):296-302. doi:10.1016/j.healthpol.2012.01.014
29. Aghababaei N, Wasserman JA, Hatami J. Personality Factors and Attitudes toward Euthanasia in Iran: Implications for End-of-Life Research and Practice. *Death Studies*. 2013;38(2):91-99. doi:10.1080/07481187.2012.731026
30. Dransart DAC, Lapierre S, Erlangsen A, et al. A systematic review of older adults' request for or attitude toward euthanasia or assisted-suicide. *Aging & Mental Health*. 2019;25(3):420-430. doi:10.1080/13607863.2019.1697201
31. Wasserman JA, Aghababaei N, Nannini D. Culture, personality, and attitudes toward euthanasia. OMEGA - *Journal of Death and Dying*. 2015;72(3):247-270. doi:10.1177/0030222815575280
32. Rahimian Z, Rahimian L, Lopez-Castroman J, et al. What medical conditions lead to a request for euthanasia? A rapid scoping review. *Health Sci Rep*. 2024;7(3):e1978. Published 2024 Mar 20. doi:10.1002/hsr2.1978
33. Evenblij K, Pasman HRW, Van Der Heide A, Hoekstra T, Onwuteaka-Philipsen BD. Factors associated with requesting and receiving euthanasia: a nationwide mortality follow-back study with a focus on patients with psychiatric disorders, dementia, or an accumulation of health problems related to old age. *BMC Medicine*. 2019;17(1). doi:10.1186/s12916-019-1276-y
34. Van Baarsen B. Suffering, Loneliness, and the Euthanasia Choice: An Explorative study. *Journal of Social Work in End-of-Life & Palliative Care*. 2009;4(3):189-213. doi:10.1080/15524250902822366
35. Doherty AM, Axe CJ, Jones DA. Investigating the relationship between euthanasia and/or assisted suicide and rates of non-assisted suicide: systematic review. *BJPsych Open*. 2022;8(4):e108. Published 2022 Jun 3. doi:10.1192/bjo.2022.71
36. Buiting H, Deeg DJH, Knol DL, et al. Older peoples' attitudes towards euthanasia and an end-of-life pill in The Netherlands: 2001–2009. *Journal of Medical Ethics*. 2012;38(5):267-273. doi:10.1136/medethics-2011-100066
37. Fritzsche DJ, Oz E. Personal values' influence on the ethical dimension of decision making. *Journal of Business Ethics*. 2007;75(4):335-343. doi:10.1007/s10551-006-9256-5

38. Kemdal AB, Montgomery H. Perspectives and emotions in personal decision making. In: *Routledge eBooks*. ; 2002:86-103. doi:10.4324/9780203444399-13
39. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. *Acta Psychiatr Scand*. 1983;67(6):361-370. doi:10.1111/j.1600-0447.1983.tb09716.x
40. Pais-Ribeiro J, Silva I, Ferreira T, Martins A, Meneses R, Baltar M. Validation study of a Portuguese version of the Hospital Anxiety and Depression Scale. *Psychol Health Med*. 2007;12(2):225-237. doi:10.1080/13548500500524088
41. Russell D, Peplau LA, Ferguson ML. Developing a measure of loneliness. *J Pers Assess*. 1978;42(3):290-294. doi:10.1207/s15327752jpa4203_11
42. Pocinho M, Farate C, Dias C. Validação Psicométrica da Escala UCLA-Loneliness para Idosos Portugueses. *Interações: sociedade e novas modernidades*.2010;18.
43. Delgado A, Lima M. Contributo para a validação concorrente de uma medida de adesão aos tratamentos. *Psicologia, Saúde & Doenças.2001*;2 (2), 81-100.
44. MAHONEY FI, BARTHEL DW. FUNCTIONAL EVALUATION: THE BARTHEL INDEX. *Md State Med J*. 1965;14:61-65.
45. Araújo F, Pais-Ribeiro J, Oliveira A, Pinto C. Validação do Índice de Barthel numa amostra de idosos não institucionalizados. *Revista Portuguesa de saúde pública*. 2007;25. 59-66.
46. Faria YS. Escala de atitude sobre eutanásia. Published 1988. https://bibliotecadigital.fgv.br/dspace/handle/10438/28192
47. Faria, Y. Atitude de médicos e advogados em relação à Eutanásia. *Arquivos Brasileiros De Psicologia*. 1989;41(2), 44–61.
48. Fonseca, L., Castro, L., Rego, G., Nunes, N. (2023). Cross-cultural adaptation and validation of an attitude about euthanasia scale in Portuguese older patients with mixed anxiety-depressive disorder. *Acta Medica Portuguesa*. Under Revision.
49. Wasserman JA, Clair JM, Ritchey FJ. A Scale to Assess Attitudes toward Euthanasia. *OMEGA - Journal of Death and Dying*. 2005;51(3):229-237. doi:10.2190/fghe-yxhx-qjea-mtm0
50. Unpublished master's thesis: Rosa, C., & Gouveia, M. *Atitudes perante a eutanásia e ansiedade perante a morte numa amostra de estudantes universitários*. Lisbon. Instituto Universitário de Ciências Psicológicas, Sociais e da Vida. 2015.
51. Mann L, Burnett P, Radford M, Ford S. The Melbourne Decision Making Questionnaire: An instrument for measuring patterns for coping with decisional conflict. *Journal of Behavioral Decision Making*. 1997;10(1), 1-19.
52. Filipe L, Alvarez M, Roberto MS, Ferreira JA. Validation and invariance across age and gender for the Melbourne Decision-Making Questionnaire in a sample of Portuguese adults. *Judgment and Decision Making*. 2020;15(1):135-148. doi:10.1017/s1930297500006951
53. Costa PT, McCrae RR. Revised NEO Personality Inventory (NEO PI-R) and NEO Five-Factor Inventory (NEO-FFI). 1992.
54. Magalhães E et al. NEO-FFI: Psychometric properties of a short personality inventory in Portuguese context. *Psicologia: Reflexão E Crítica*. 2014;27(4):642-657. doi:10.1590/1678-7153.201427405
55. Davis MA Multidimensional Approach to Individual Differences in Empathy. *Journal of Personality and Social Psychology*. 1980; 10, 85.
56. Limpo T, Alves R, Castro S. Medir a empatia: Adaptação portuguesa do Índice de Reactividade Interpessoal. *Laboratório De Psicologia*. 2010; *8*(2), 171–184.
57. Ware JE Jr, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care*. 1992;30(6):473-483.
58. Ferreira PL. Criação da versão portuguesa do MOS SF-36. Parte I – Adaptação cultural e linguística. *Acta Med Port*. 2000 Jan-Abr; 13(1-2): 55-66.
59. Ferreira PL. Criação da versão portuguesa do MOS SF-36. Parte II – Testes de validação. *Acta Med Port*. 2000 Mai-Jun; 13(3): 119-27.
60. Kutcher S, Chehil S. *Suicide risk management: A manual for health professionals*. Malden, MA: Blackwell Publishing Ltd; 2007.
61. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state." *Journal of Psychiatric Research*. 1975;12(3):189-198. doi:10.1016/0022-3956(75)90026-6
62. Unpublished doctoral dissertation: Guerreiro, M. *Contributo da Neuropsicologia para o Estudo das Demências.* Lisbon. University of Lisbon. 1998.
63. Cacho, J., García-García, R., Arcaya, J., Vicente, J. L., Lantada, N. Una propuesta de aplicación y puntuación del test del reloj en la enfermedad de Alzheimer [A proposal for application and scoring of the Clock Drawing Test in Alzheimer's disease]. *Revista de neurología*. 1999;*28*(7), 648–655.
64. Rouleau I, Salmon DP, Butters N, Kennedy CM, McGuire K. Quantitative and qualitative analyses of clock drawings in Alzheimer's and Huntington's disease. *Brain and Cognition*. 1992;18(1):70-87. doi:10.1016/0278-2626(92)90112-y

65. Santana I, Duro D, Lemos R, et al. Mini-Mental State Examination: Avaliação dos Novos Dados Normativos no Rastreio e Diagnóstico do Défice Cognitivo. *Acta Médica Portuguesa*. 2016;29(4):240-248. doi:10.20344/amp.6889
66. Santana I, Duro D, Freitas S, Alves LB, Simões MR. The Clock Drawing Test: Portuguese norms, by age and education, for three different scoring systems. *Archives of Clinical Neuropsychology*. 2013;28(4):375-387. doi:10.1093/arclin/act016
67. Goodglass, H. and Kaplan, E. (1972) The Assessment of aphasia and Related Disorders. Lea & Febiger, Philadelphia.
68. Kaplan E.. Bull T., Bryant B. K. A process approach to neuropsychological assessment, *Clinical neuropsychology and brain function: Research, measurement, and practice*, 1988Washington, DCAmerican Psychological Association(pg. 129-167)
69. Condições em que a morte medicamente assistida não é punível Act 22, 2023 (Portugal).
70. Calcedo-Barba A, Fructuoso A, Martínez-Raga J, Paz S, De Carmona MS, Vicens E. A meta-review of literature reviews assessing the capacity of patients with severe mental disorders to make decisions about their healthcare. *BMC Psychiatry*. 2020;20(1). doi:10.1186/s12888-020-02756-0
71. Kotzé C, Roos JL. Ageism, human rights and ethical aspects of end-of-life care for older people with serious mental illness. *Frontiers in Psychiatry*. 2022;13. doi:10.3389/fpsyt.2022.906873
72. Van Der Geest S, Satalkar PP. Autonomy and dying: Notes about decision-making and "completed life" euthanasia in the Netherlands. *Death Studies*. 2019;45(8):613-622. doi:10.1080/07481187.2019.1671543
73. Flynn K, Smith M. Personality and health care decision-making style. *The journals of gerontology*. Series B, Psychological sciences and social sciences 62 5. 2007; P261-7 .
74. Othman RE, Othman RE, Hallit R, Obeïd S, Hallit S. Personality traits, emotional intelligence and decision-making styles in Lebanese universities medical students. *BMC Psychology*. 2020;8(1). doi:10.1186/s40359-020-00406-4
75. Skagerlund K, Forsblad M, Tinghög G, Västfjäll D. Decision-making competence and cognitive abilities: Which abilities matter? *Journal of Behavioral Decision Making*. 2021;35(1). doi:10.1002/bdm.2242
76. Fenton L, Han SD, DiGuiseppi CG, et al. Mild Cognitive Impairment is Associated with Poorer Everyday Decision Making. *J Alzheimers Dis*. 2023;94(4):1607-1615. doi:10.3233/JAD-230222
77. Fonseca L, Monteleone F, Gonçalves A, Rêgo G, Nunes R. Decision-Making Capacity of Elderly Patients with Mixed Depression-Anxiety Disorder. *Acta Médica Portuguesa*. Published online April 12, 2023. doi:10.20344/amp.19682
78. Verhofstadt M, Van Assche K, Sterckx S, Audenaert K, Chambaere K. Psychiatric patients requesting euthanasia: Guidelines for sound clinical and ethical decision making. *International Journal of Law and Psychiatry*. 2019;64:150-161. doi:10.1016/j.ijlp.2019.04.004
79. Biro D. Is There Such a Thing as Psychological Pain? and Why It Matters. *Culture, Medicine and Psychiatry*. 2010;34(4):658-667. doi:10.1007/s11013-010-9190-y
80. Dees M, Vernooij-Dassen MJFJ, Dekkers W, Van Weel C. Unbearable suffering of patients with a request for euthanasia or physician-assisted suicide: an integrative review. *Psycho-Oncology*. 2010;19(4):339-352. doi:10.1002/pon.1612
81. Verhofstadt M, Thienpont L, Peters GJ. When unbearable suffering incites psychiatric patients to request euthanasia: qualitative study. *The British Journal of Psychiatry*. 2017;211(4):238-245. doi:10.1192/bjp.bp.117.199331
82. Trachsel M, Jox RJ. Suffering is not enough: Assisted dying for people with mental illness. *Bioethics*. 2022;36(5):519-524. doi:10.1111/bioe.13002
83. Newson JJ, Hunter D, Thiagarajan TC. The Heterogeneity of Mental Health Assessment. *Front Psychiatry*. 2020;11:76. Published 2020 February 27. doi:10.3389/fpsyt.2020.00076
84. Lake J, Turner MS. Urgent need for improved mental health care and a more collaborative model of care. *The Permanente Journal*. 2017;21(4). doi:10.7812/tpp/17-024
85. Carvajal C. Poor response to treatment: beyond medication. *Dialogues in Clinical Neuroscience*. 2004;6(1):93-103. doi:10.31887/dcns.2004.6.1/ccarvajal
86. Howes O, Thase ME, Pillinger T. Treatment resistance in psychiatry: state of the art and new directions. *Molecular Psychiatry*. 2021;27(1):58-72. doi:10.1038/s41380-021-01200-3
87. McKee K, Schüz B. Psychosocial factors in healthy ageing. *Psychology & Health*. 2015;30(6):607-626. doi:10.1080/08870446.2015.1026905
88. Fuchs T. Subjectivity and intersubjectivity in psychiatric diagnosis. *Psychopathology*. 2010;43(4):268-274. doi:10.1159/000315126
89. Van Veen S, Widdershoven G, Beekman A, Evans N. Physician Assisted Death for Psychiatric Suffering: Experiences in the Netherlands. *Frontiers in Psychiatry*. 2022;13. doi:10.3389/fpsyt.2022.895387
90. Van Den Berg V, Zomers M, Van Thiel GJMW, Leget C, Van Delden JJM, Van Wijngaarden E. Requests for euthanasia or assisted suicide of people without (severe) illness. *Health Policy*. 2022;126(8):824-830. doi:10.1016/j.healthpol.2022.06.004

 doi:10.20944/preprints202404.0671.v1

91. Hartog ID, Zomers M, Van Thiel GJMW, et al. Prevalence and characteristics of older adults with a persistent death wish without severe illness: a large cross-sectional survey. *BMC Geriatrics*. 2020;20(1). doi:10.1186/s12877-020-01735-0
92. Dierickx S, Deliëns L, Cohen J, Chambaere K. Euthanasia for people with psychiatric disorders or dementia in Belgium: analysis of officially reported cases. *BMC Psychiatry*. 2017;17(1). doi:10.1186/s12888-017-1369-0
93. Jones DF, Gastmans C, MacKellar C. *Euthanasia and assisted suicide*.; 2017. doi:10.1017/9781108182799
94. Meyer J, Lüdtke O, Schmidt FTC, Fleckenstein J, Trautwein U, Köller O. Conscientiousness and cognitive ability as predictors of academic achievement: evidence of synergistic effects from integrative data analysis. *European Journal of Personality*. 2022;38(1):36-52. doi:10.1177/08902070221127065
95. Namba S, Kabir RS, Matsuda K, et al. Fantasy Component of Interpersonal Reactivity is Associated with Empathic Accuracy: Findings from Behavioral Experiments with Implications for Applied Settings. *Reading Psychology*. 2021;42(7):788-806. doi:10.1080/02702711.2021.1939823