Depression, anxiety and loneliness in ageing: Dynamics of a trio in times of pandemic COVID-19

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Dedicatória

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Resumo

Objetivo: Avaliar e analisar a relação entre depressão, ansiedade e solidão numa população idosa, durante a primeira vaga da pandemia por COVID-19 em Portugal.

Métodos: A recolha de dados foi realizada através de entrevistas telefónicas, entre 15 e 30 de abril de 2020, a uma população idosa que participou num estudo em 2012.

Resultados: Mais de metade da amostra demonstrou níveis significativos de ansiedade e 27% de depressão. Solidão, pior perceção de saúde, género feminino, menores habilitações literárias e maior limitação funcional nas atividades da vida diária foram associados a níveis de ansiedade mais elevados. Além disso, solidão, viver sozinho, maior idade e maior dependência nas atividades instrumentais da vida diária foram associados a níveis de depressão mais elevados. Mais de 62% dos participantes reportaram algum grau de solidão, com mais de metade a reportar agravamento desta durante o confinamento. Não ter parceiro e viver sozinho foram identificados como fatores de risco para maior solidão.

Conclusão: No nosso estudo, os participantes relataram uma elevada percentagem de ansiedade, depressão e solidão, possivelmente valores agravados pela pandemia e pelas restrições impostas. Existem vários fatores modificáveis que foram relacionados com as variáveis centrais do estudo. É necessário ter em especial atenção não só as consequências físicas, mas também o impacto da pandemia no estado mental: é necessário ter uma visão clínica holística do impacto do confinamento na população geriátrica, com inclusão de uma avaliação psicológica, aliada à promoção e adaptação dos programas e medidas a este grupo etário e ao período de pandemia.

Palavras-chave

COVID-19;Ansiedade;Depressão;Solidão;Idosos

Resumo Alargado

A incerteza quanto ao futuro, a parca quantidade de informação sobre COVID-19 e o receio de ser infetado, aliados às restrições impostas mundialmente, com efeitos imprevisíveis a longo prazo, têm criado uma crise de saúde mental, com o surgimento de sentimentos de stress, medo e ansiedade.

A população idosa, como grupo vulnerável, tem vindo a sofrer consequências das alterações da vida diária impostas, nomeadamente a impossibilidade de realizar as atividades de rotina, restrição dos contactos com a família e amigos e dificuldade no acesso a serviços de suporte social e a cuidados de saúde.

Entre as patologias mais frequentes nos idosos são de destacar a depressão e a ansiedade, que influenciam e estão associadas a outras comorbilidades.

A solidão é considerada um problema e um desafio nos mais envelhecidos, estando também associada a *outcomes* de saúde negativos, nomeadamente problemas de saúde mental.

Deste modo, no contexto da pandemia, prevê-se que a percentagem de população com patologia mental aumente, bem como sentimentos de solidão, embora não existam ainda estudos suficientes para quantificar o impacto da quarentena.

Neste estudo, pretendeu-se avaliar os níveis de depressão, ansiedade e solidão na população idosa, bem como o impacto que vários fatores sociodemográficos têm nestas variáveis, durante a primeira vaga da pandemia por COVID-19, período em que vigorava o recolhimento obrigatório em Portugal.

Aplicou-se um questionário delineado para estudar as variáveis à população que tinha participado num estudo em 2012, entre 15 e 30 de abril, via telefone, dado o contexto de pandemia e as restrições impostas. Inicialmente, foram colocadas algumas questões que permitiram atualizar os dados sociodemográficos obtidos em 2012. Neste questionário foram incluídas várias questões e escalas que permitiram avaliar e analisar os objetivos do estudo, nomeadamente, dependência nas atividades da vida diária, perceção de saúde de cada participante, nível de depressão (*Geriatric Depression Scale*), nível de ansiedade (*Geriatric Anxiety Inventory*) e nível de solidão. Adicionalmente, durante as entrevistas, forneceram-se algumas informações sobre

como se proteger do vírus e informações sobre serviços de apoio psicológico disponíveis à população durante este período.

A população de amostra da cidade da Covilhã apresentou uma percentagem elevada e preocupante de ansiedade, depressão e solidão, potencialmente agravadas pelo contexto de pandemia por COVID-19, havendo vários fatores sociodemográficos associados a uma maior prevalência destas variáveis.

Relativamente à ansiedade, conclui-se que níveis mais elevados de solidão, ser do género feminino, ter uma pior perceção de saúde, ter menos habilitações literárias e maior incapacidade funcional estão associados a um reporte mais elevado desta sintomatologia.

Quanto aos fatores de risco para a depressão foram identificados os seguintes: solidão, viver sozinho, maior idade e maior dependência nas atividades instrumentais da vida diária.

Por último, não ter parceiro e viver sozinho são dois fatores associados a maior prevalência da variável solidão. Mais de metade dos participantes do nosso estudo referiu que o sentimento de solidão piorou, quando comparado com os meses prévios à pandemia.

Relativamente à análise de uma possível associação entre as três variáveis principais do estudo verificou-se que há uma relação direta entre todas.

Posto isto, é essencial ter em conta não só as consequências físicas do confinamento imposto e da pandemia, mas também ter uma visão clínica holística, que inclua uma avaliação do estado mental dos idosos, de modo a minimizar o impacto no bem-estar da população mais envelhecida.

Além disso, é necessário desenvolver estratégias que permitam combater a solidão, dado o aumento do risco potencial de comorbilidades, dependência e mortalidade na população em geral, e em específico os idosos, um grupo por si só numa posição mais vulnerável.

Apesar da tecnologia ser uma forma de combater o impacto das restrições, é necessário ter em conta que o modo de intervenção não se pode basear unicamente nesta, dado a considerável percentagem da população idosa sem conhecimento ou acesso a equipamento que lhes permita comunicar e pedir auxílio através desta. Assim, devem-

se adaptar os programas de combate à solidão e doenças mentais às particularidades desta faixa etária e encorajar estudos de investigação com amostras pertencentes a esta população.

Ainda não é possível prever as consequências a longo prazo do confinamento e da pandemia, sendo necessário realizar uma avaliação do estado mental da população num período pós-pandemia, além de criar e facilitar o acesso a serviços de apoio psicológico, especializados na população mais envelhecida, tendo em mente o provável agravamento da sintomatologia.

Abstract

Purpose: To assess and analyze the relations between depression, anxiety and loneliness in an elderly population during the first wave of the COVID-19 pandemic in Portugal.

Methods: Data was collected through telephone interview, between 15th and 30th April 2020, with elderly people, that had participated in a randomized study in 2012.

Results: More than half of the sample demonstrated significant levels of anxiety and 27% showed significant levels of depression. Loneliness, worse health perception, female gender, lower educational attainment and greater functional limitation were associated with higher levels of anxiety. Also, loneliness, living alone, older age and dependence on instrumental activities of daily living were variables associated with higher levels of depression. Over 62% of the participants reported some level of loneliness, with more than half of them reporting worsening of this condition during confinement. Not having a partner/being unmarried and living alone were risk factors for loneliness.

Conclusion: Participants had a high percentage of anxiety, depression and loneliness in this study, possibly aggravated by the pandemic and the restrictions imposed. There were several modifiable factors related with these variables. It is necessary to pay special attention not only to the physical but also to the psychological consequences of the pandemic: we need to have a clinically holistic view of the impact of the confinement in the geriatric population, with the inclusion of a psychological assessment, and to promote and adapt populational programs and measures to this age group and to the pandemic period.

Keywords

COVID-19, Anxiety, Depression, Loneliness, Elderly

Index

List of Tables

Acronym List

BADL	Basic Activities of Daily Living
CAS	Covilhã Aging Study
CI	Confidence Interval
COVID-19	Coronavirus Disease 2019
GAI-SF	Geriatric Anxiety Inventory – Short Form
GDS	Geriatric Depression Scale
IADL	Instrumental Activities of Daily Living
OR	Odds Ratio
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SD	Standard Deviation

1. Introduction

The uncertainty about the future, the lack of more information about COVID-19 and the fear of being infected, together with the restrictions imposed worldwide, whose effects can only be analyzed and evaluated later, has created a mental health crisis, with the triggering of feelings of stress, fear and anxiety [1,2,3,4].

These measures have influence on several levels, such as physical, social, economic and psychological well-being of the entire population. However, it is not only a physical health emergency, but also it is important to consider the consequences, still unpredictable in the long run, on the prevalence of mental pathologies, namely anxiety and depression, and life's quality [2,5,6,7,8].

COVID-19 is a disease caused by the SARS-CoV-2 virus, first described in December 2019 in the city of Wuhan [9]. Since then it has spread worldwide, with more than 70 million people infected and 1.7 million deaths at the end of 2020 [10]. In Portugal, the first case of coronavirus infection was registered in March 2020 [11], with a cumulative total of more than 300 thousand confirmed cases and having already surpassed 5000 deaths in December of that same year [10].

Since the beginning of the COVID-19 pandemic, the scientific community has been struggling to characterize the virus and to find a treatment and a cure to this disease, however, until December 2020, it was not possible to discover a therapy that allows effective control in all the cases [10, 12, 13]. Vaccination is planned to start at the end of 2020 and it is expected to help limiting the transmission and control the pandemic.

Globally, strategies were adopted to control infected cases and to limit the spread of the virus, with a focus on physical distance and curfew [2, 4, 5, 12]. In Portugal, several measures were adopted during the first lockdown, namely duty of obligatory home curfew (leaving home for the acquisition of goods and other exceptions), closing of non-essential services, social distance, mandatory teleworking, prohibition of holding religious events or other events that involve agglomeration of people [14].

These measures caused disruption at the individual, familiar and community levels [6, 12], with changes in routines putting normality on hold for an indefinite period. Such actions affected the entire population and implied, in many cases, the separation of

families and the prohibition of some work, leisure and social activities, resulting in decreased social support [2, 5, 6, 7, 12, 15].

The older population, as a group considered vulnerable by the inherent comorbidities [12, 16], has been suffering the consequences of restrictions imposed during quarantine, namely the physical isolation [4, 6, 7, 12].

In addition, the information overload by the media on COVID-19, coupled with illiteracy in health, which is still frequent in this population, has exacerbated the feeling of hopelessness in the future [3, 4, 12].

According to the World Health Organization, with the evident trend of increasing aging, approximately 15% of the world population over the age of 60 suffers from mental status disorder, which will condition their role as an active member of the community [17, 18]. With the pandemic and the restrictions imposed, this percentage will tend to increase, although there are not yet enough studies to determine this impact [4].

Depression, a common mental condition, considered a treatable disease, is one of the main causes of disability worldwide and contributes a lot to the global burden of the disease [18, 19], being essential to make an early diagnosis in order to achieve an early treatment [18, 19, 20, 21]. Among the various psychopathologies, depression in old age stands out for its high prevalence [3, 19, 22, 23, 24], however, this is not part of the normal course of aging [17, 18].

Important events at this stage of life, such as chronic and debilitating medical disorders, with the consequent increase in the risk of accidents in daily life, loss of friends and loved ones and the inability to perform everyday tasks and to participate in formerly loved activities can strongly affect the emotional well-being of an elderly person, causing feelings of malaise, stress and sadness [25, 26], combined with a feeling of lack of control over life, due to the loss of functional, financial and social independence [23, 24, 27]. However, some elderly people may manifest organic symptoms or have no need to explore their feelings, making it difficult to recognize the disease [20, 26].

Another mental health problem that often affects older people is anxiety disorder [23]. A high level of anxiety is associated with several diseases [28], such as cardiovascular problems, decreased cognitive function, sleep disturbance and addictive behaviors such as smoking and alcoholism [23].

Loneliness is considered a problem and a challenge in the elderly [29], being associated with negative health outcomes, such as mental health problems [30] (namely anxiety and depression, establishing a relationship between them [24, 28]), functional and cognitive decline and increased mortality [24, 30, 31, 32]. Thus, it is extremely important to know and prevent risk factors for greater loneliness. The occurrence of the critical events at this stage of life referred above lead to an increase in loneliness [33].

In the context of the COVID-19 pandemic and its restrictions, namely the impossibility to carrying out the activities that were part of their routine, limitations of visits from family and friendships and the difficulty in accessing social support and medical care services [15], studies have reported worsening symptoms of depression and anxiety [4, 34], with functional impairment, lower quality of life and reduced mental well-being [15]. These also increased feelings of loneliness and isolation among the elderly [4, 7, 12].

In this study, it was intended to: (1) Assess the participants' anxiety, depression and loneliness; (2) Assess if the participants feel the same, more or less loneliness than before the pandemic; (3) Analyze the associations between the variables "anxiety", "depression" and "loneliness"; (4) Find out if there are differences in terms of anxiety, depression and loneliness according to gender, age group, health perception, the number of people in the household, the degree of dependence on activities of daily living and the communication equipment each participant used.

2. Methods

2.1 Procedures and Participants

A longitudinal follow-up study was carried out with the participants of the Covilhã Aging Study (CAS) [35]. Thus, and after verifying that 68 participants of the first study had already died, contact was made with the remaining 155.
After collecting the data, it was concluded that, of the 155 interviewees, 107 accepted to answer the questionnaire, 17 did not accept to participate and that it was not possible to establish contact with 33 of the participants. Only questionnaires answered in their entirety were chosen as inclusion criteria, so it was decided not to include in our study the data collected in 22 of the 107 interviews conducted.

Given the current pandemic context, the interviews were conducted by two researchers, via telephone, with an average duration of 18 minutes per call, between 15th and 30th April 2020, when the first lockdown and the first wave of the pandemic were experienced in Portugal. During this period, the second state of emergency was occurring in Portugal, accounting for less than 1000 deaths and less than 25000 cases of COVID-19 infection in the country [11]. In particular, in Covilhã, where the study sample originated, up to the last day of interviews, there were 7 cases of infection, cumulatively [11].

2.2 Measures

A brief questionnaire was designed, in which, in the initial part, it was possible to update the socio-demographic information from 2012, relevant to data analysis, such as number of elements and place of residence, marital status and educational qualifications.

In order to study the perception that each participant had of their health, they were asked to classify it as: “Poor”, “Acceptable” and “Good”.

To classify the difficulties experienced in activities of daily living (BADL and IADL), as well as the functional status of each participant, the following nomenclature was used as an answer hypothesis: “Do not feel difficulty”, “Feel some difficulty”, “Feel a lot of difficulty” and “Totally dependent”.

If the person reported a high degree of dependence or if it was not possible to answer the question, it was decided not to apply the remaining questionnaire, evaluating only the general condition of the interviewee.

For the study of depression, we used the reduced version of the Geriatric Depression Scale - 30, the GDS-4 [36] which is simple and quick to apply with 4 items of dichotomous response (“Yes / No”), about the feelings and behaviors that took place in the months preceding the questionnaire. To each answer was assigned 1 value, with a maximum score of 4. For the analysis of this scale, a score equal to or greater than 2 values was chosen as the cutoff point to be considered suggestive of relevant symptoms.

Regarding the assessment of anxiety, GAI - SF version of 5 items [37] from the Geriatric Anxiety Inventory, also with a dichotomous response (“Yes” / “No”), each with a maximum of 5 points, was used. For this scale, a cut-off point of 3 points was defined, which allows the detection of significant anxiety symptoms.

As for loneliness, the question asked was “Are you feeling alone?” with possible answers: “Always”, “Often”, “Sometimes” and “Never”. Participants were asked to compare this variable with the period before the pandemic, classifying it as feeling: “More alone”, “Less alone” and “Neither more nor less alone”.

It was also evaluated whether the participants had support when they needed to talk, having been provided the numbers of psychological support services, available by phone. They were also asked about the possession of equipment and technologies that would allow them to communicate remotely, specifying each medium: "Personally", "Telephone / cell phone", "Internet" and "Others".

Finally, at the end of each interview was given guidance about the equipment and measures that could protect from COVID-19.

2.3 Data analysis

Statistical analysis was performed using the SPSS program (version 24, IBM). Descriptive statistics was used to summarize the general characteristics of the population. Univariate analyses exploring associations between individual risk factors and loneliness, GDS and GAI-SF scores were performed using Fisher´s exact test for dichotomous variables and Student´s t test for continuous variables.

Additionally, odds ratio (OR) was calculated for dichotomous variables to describe the strength of the relation between categorical risk factors and loneliness.

Multivariate logistic regression model for loneliness was developed to explore the relative contributions of the various possible risk factors “gender”, “age”, “health perception”, “educational qualifications”, “marital status”, “number of people in the household”, “basic and instrumental activities of daily living”, “anxiety”, “depression” and “using the internet”.

Pearson´s correlation coefficient was used to determine the correlation between each of the three main variables of the study and factors like “educational attainment” and “age”.

Statistical significance was attributed whenever a p-value of ≤0.05 was obtained.

3. Results

The mean age of our sample was 78 years (SD ± 5.039), with values between 73 and 95 years. Of the 85 participants, 55.3% were female, 63.5% were married, 22% lived alone and almost all participants (88.2%) reported living in their own home. In our sample, more than half (58.8%) lived with their spouse, and, regarding the level of education, 61.9% had elementary education (see table 1).

Table 1 – General Characteristics of participants (N= 85)

	Sample Size	Percentage
Gender		
Female	47	55.3
Male	38	44.7
Age, years		
70-74	15	17.6
75-84	51	60.0
≥ 85	19	22.4
Education		
Illiterate	2	2.4
Elementary School	52	61.9
Middle school	21	25.0
High school	9	10.7
Marital status		
Married/Partner	54	63.5
Unmarried	31	36.5
Residence		
Own home	75	88,3
Family home	4	4,7
Nursing home	3	3,5
Other	3	3,5
Health perception		
Poor	14	16.5
Acceptable	44	51.8
Good	27	31.7
Living situation		
Alone	18	22.0
Not alone	64	78.0
BADL		
Independence	65	76.5
Some dependence	20	23.5
IADL		
Independence	63	74.1
Some dependence	20	23.5
Complete dependence	2	2.4

* Widower 24.7%; Single 10.6%; Divorced 1.2%

The mean score on the GAI-SF scale was 2.98 ±1.45 (95% CI: 2.68-3.25).

Concerning depression, the mean score on the GDS scale was 1.16±1.22 (95% CI: 0.95-1.39) with 27.1% of the sample above the level of depression considered significant (see

table 2). The percentage of participants who reported some level of loneliness was 62.6% and, when asked to compare this feeling of loneliness with the months that preceded the pandemic, it was found that 51.8% of the participants felt more alone, 3.5% felt less alone and 44.7% felt equally alone.

Table 2 – Analysis between Anxiety, Depression and Sociodemographic Factors

	Sample size	Mean GAI-SF score±SD	Statistic value (p-value)	Mean GDS score±SD	Statistic value (p-value)	Loneliness		Chi-square p-value
						No/ Low	High	
Total sample	85	2.98±1.45 (95% CI: 2.68-3.25)		1.16±1.22 (95% CI: 0.95-1.39)				
Gender - Female - Male	 47 38	 3.34±1.46 2.53±1.31	 t=2.703 p=0.008	 1.28±1.36 1.03±1.03	 t=0.937 p=0.351	 35 34	 12 4	 X^2=3.096 p=0.098
Marital status - Married or Partner - Unmarried*	 54 31	 2.78±1.42 3.32±1.45	 t=-1.689 p=0.095	 0.98±1.04 1.48±1.46	 t=-1.689 p=0.098	 48 21	 6 10	 X^2=5.764 p=0.022
Loneliness - High - No/Low	 16 69	 3.94± 1.06 2.75±1.44	 t=-3.373 p=0.001	 2.31±1.45 0.90±1.0	 t=-4.649 p<0.001			
Living situation - Alone - Not alone	 18 64	 3.22±1.44 2.86±1.44	 t=-0.947 p=0.352	 1.67±1.46 0.97±1.05	 t=-2.273 p=0.026	 11 56	 7 8	 X^2=6.545 p=0.017
Health perception - Poor - Acceptable - Good	 14 44 27	 3.86±0.95 2.98±1.61 2.52±1.19	 F=4.248 p=0.018	 1.50±1.4 1.09±1.24 1.11±1.12	 F=0.626 p=0.537	 10 37 22	 4 7 5	
BADL - Independence - Some dependence	 65 20	 2.71±1.39 3.85±1.31	 t=-3.259 p=0.002	 1.02±1.13 1.65± 1.42	 t=-1.83 p=0.079	 55 14	 10 6	 X^2=2.138 p=0.19
IADL - Independence - Some dependence	 63 20	 2.62±1.39 4.05±1.05	 t=-4.244 p<0.001	 0.98± 1.11 1.70±1.38	 t=-2.36 p=0.021	 53 14	 10 6	 X^2=1.947 p=0.197
Internet - No - Yes	 48 37	 3.19±1.50 2.70±1.35	 t=1.544 p=0.126	 1.29±1.32 1.00±1.08	 t=1.09 p=0.999	 39 30	 9 7	 X^2<0.001 p=1

* Widower 24.7%; Single 10.6%; Divorced 1.2%

Evaluating the relationship between the variables “anxiety” and “loneliness”, with the Student’s t-test, it was concluded that those who reported loneliness levels as high presented higher GAI-SF values (3.94 ± 1.06) than those who reported low or nonexistent loneliness (2.75 ± 1.44) (p-value=0.001) (see Table 2). Also, when proceeding to multivariate analysis with the logistic regression model, it was found that having significant anxiety was a risk factor for loneliness (OR: 5.14, CI: 1-26.496) (p-value=0.05) (see table 3), having a direct relationship.

As for the variables “depression” and “loneliness” it was found a direct association, given that, also with the Student’s t-test, it was concluded that those who reported high

loneliness levels had higher GDS values (2.31 ± 1.45) than those who reported low or nonexistent loneliness (0.90 ± 1.0) (p-value<0.001) (see table 2) and, in addition, having significant depression was a risk factor for loneliness (OR: 3.828, CI: 1.058-13.847) (see table 3).

Table 3 – Factors associated with loneliness

	Low/No loneliness	High loneliness	Total	Univariate			Multivariate		
	N (%)	N (%)	N (%)	OR	95 % CI	P	OR	95% CI	P
Gender - Male - Female	34 (49.3) 35 (50.7)	4 (75.0) 12 (25.0)	38 (44.7) 47 (55.3)	Ref 2.914	(0.885-9.931)	0,087			NS
Age - 70-74 - 75-84 - ≥85	11 (15.9) 44 (63.8) 14 (20.3)	4 (25.0) 7 (43.8) 5 (31.3)	15 (17.6) 51 (60.0) 19 (22.4)	Ref 0.438 0.982	(0.108-1.765) (0.212-4.553)	0.245 0.982			NS
Education - High school - Middle school - Elementary school - Illiterate	8 (2.9) 19 (27.9) 39 (57.4) 2 (2.9)	1 (6.3) 2 (12.5) 13 (81.3) 0 (0)	9 (10.7) 21 (25.9) 52 (61.9) 2(2.4)	Ref 0.842 2.667 -	(0.067-10.667) (0.304-23.392) -	0.894 0.376 -			NS
Marital status - Married/ Partner - Unmarried*	48 (69.6) 21 (30.4)	6 (37.5) 10 (62.5)	54 (63.5) 31 (36.5)	Ref 3.810	(1.225-11.848)	0,021	Ref 3.681	(1.035-13.1)	0,044
Living Situation - Not alone - Alone	56 (83.6) 11 (16.4)	8 (53.3) 7 (47.6)	64 (78.0) 18 (22.0)	Ref 4.455	(1.388-14.831)	0.015			NS
Health perception - Good - Acceptable - Poor	22 (31.9) 37 (53.6) 10 (14.5)	5 (31.3) 7 (43.8) 4 (25.0)	27 (31.8) 44 (51.8) 14 (16.4)	0.464 0.776	Ref 0.832 1.760	(0.235-2.944) (0.388-7.986)	NS		
BADL -Independence	55 (79.7)	10 (62.5)	65 (76.5)	Ref	(0.732-	0.151			NS

-Some dependence	14 (20.3)	6 (37.5)	20 (23.5)	2.357	7.594)				
IADL -Independence -Some dependence	53 (76.8) 14 (20.3)	8 (50.0) 8 (50.0)	63 (74.1) 20 (23.5)	Ref 2.271	(0.704-7.326)	0.170			NS
Anxiety -No significant - Significant	33 (47.8) 36 (52.2)	2 (12.5) 14 (87.5)	35 (41.2) 50 (58.8)	Ref 6.417	(1.355-30.386)	0.019	Ref 5.14	(1-26.496)	0.05
Depression -No significant - Significant	55 (79.7) 14 (20.3)	7 (43.8) 9 (56.3)	62 (72.9) 23 (27.1)	Ref 5.051	(1.601-15.934)	0.006	Ref 3.828	(1.058-13.847)	0.041
Internet - No - Yes	30 (43.5) 39 (56.5)	7 (43.8) 9 (56.3)	37 (43.5) 48 (56.5)	Ref. 0.989	(0.33-2.961)	0.984			

* Widower 24.7%; Single 10.6%; Divorced 1.2%

In what concerns the relation between the study variables and the "marital status", with the multivariate analysis of the logistic regression model, it was found that not being married implies a 3.681 (95% CI: 1.035-13.1) higher risk of feeling lonely than being married (see table 3). The analysis of GAI-SF and GDS score and the relationship with marital status were not significant (see table 2).

In relation to the influence of the variable "health perception" and anxiety, with Student's t-test, it was found that the average GAI-SF score was higher in the group that reported worse health perception (3.86 ± 0.95) and lower in those with better health perception (2.52 ± 1.19). Regarding the analysis of loneliness and the GDS score and the relationship with health perception, it was found that the results were not significant.

Relatively the influence of the number of members of the household, the average GDS score was higher in those who lived alone (1.67 ± 1.46) than those who lived together (0.97 ± 1.05) (see table 2) and it was found that living alone increases the likelihood of feeling loneliness by 4.455 (1.388-14.831) times, when compared to those who were accompanied (see table 3). The GAI-SF score did not have a significant relationship with this factor (see table 2).

There were no significant differences between those who use equipment to communicate, when compared to those who did not have equipment, regarding the main study variables (see tables 2 and 3).

Table 4 – Correlations between Anxiety, depression and loneliness

Correlations	**Anxiety**	**Depression**
Age	*Pearson* 0.07 (p=0.524)	*Pearson* 0.294 (p=0.006)
Education	*Pearson* -0,253 (p=0.022)	*Pearson* -0.129 (p=0.25)

Through Pearson's Correlation it was found that there is a positive correlation between the variables “age” and “depression” and it was found a negative correlation between “education” and “anxiety”. There were no significant relationships between “anxiety” and “age” and between “depression” and “education” (see table 4)

It was found that neither “age” nor “education” showed a significant relationship with loneliness (see tables 3 and 4)

The mean GAI-SF score was higher in women (3.34 ± 1.46) than in men (2.53 ± 1.31) (p-value=0.008) (see table 2). Regarding the analysis of the GDS score and the relationship with gender, it was found that the results were not significant (see table 2). Analyzing loneliness and the relationship with gender, it was found that the results were also not significant (see tables 2 and 3).

Relatively BADL, the average GAI-SF score was higher in those with some dependence (3.85 ± 1.31) than those who were independent (2.71 ± 1.39). Regarding the analysis of the GDS score and loneliness, it was found that the results were not significant. (see table 2)

As for the IADLs, the average score of GAI-SF and GDS was higher in those with some dependence ((4.05 ± 1.05) and (1.70 ± 1.38), respectively) than those who considered themselves independent ((2.62 ± 1.39) and (0.98 ± 1.11), respectively) (see table 2). There was not found a significant association between loneliness and the classification of the independence in the IADLs (see tables 2 and 3).

4. Discussion

The aim of this study was to evaluate depression, anxiety and loneliness in an elderly population, as well as the relation of sociodemographic factors on these features, during the first wave of the COVID-19 pandemic, when it was indicated to stay at home and to avoid social contacts, being the media the main source of information and update of this unknow virus.

In our study it was found that more than half of the sample demonstrated significant levels of anxiety and a quarter demonstrated significant levels of depression, higher values than those obtained in a cohort study of 2017 carried out with Portuguese seniors [21]. However, since there is a time difference between 2017 and 2020, it is important to consider other events that could occur and increase this percentage.

Particularly with anxiety, our results were higher than those from a study carried out with older adults during the first lockdown and lower in relation to depression [8], possibly by the populational differences.

There are some studies showing that the prevalence of these symptoms increased significantly during confinement [38, 39, 40], and, in a study by Li et al. [41], it was concluded that there was an increase in shares about anxiety and depression and a decrease in positive thoughts when compared to the pre-pandemic period.

The results obtained in our study should be evaluated attentively because they report worrying levels of anxiety and depression during a pandemic context. There is a potential to aggravate this percentage during this period, given the implications for quality of life and mortality, confirmed by several studies, with the risk of aggravating other comorbidities [18, 19, 24, 28, 30, 32, 40].

About the predictors of anxiety, in our study, it was concluded that higher levels of loneliness, worse health perception [12, 28], female gender, lower literary qualifications and greater functional limitation, both in BADL and IADL, and not being married were associated with higher levels of anxiety. These results are supported by other studies [8,23,28,42,43,44], showing the solid influence of these factors on anxiety levels.

Concerning the risk factors for depression, loneliness was one of them as shown in several studies [26, 29, 33, 42] as well as and living alone, hypothesis supported by other authors [39, 45], what could explain the higher percentage of depression. Also, in our study, older age and the dependence on IADLs were associated with more depression, corroborated by other studies [46,47]. These can be explained by the fact that the inability to perform everyday tasks and to participate in formerly loved activities can strongly affect the emotional well-being of and elderly person [25, 26], exacerbated by the loss of financial and social independence [23, 24, 27].

Some studies [42, 45] also report a higher prevalence of depressive symptoms in female gender, hypothesis not verified in our study, possibly because these studies were carried out before the pandemic and men were more involved in outside social activities as expected for this group of people in our culture, leading them to have felt more difference during confinement, thus reducing the difference between genders.

In our study there was not a correlation between education and depression, contrary to what was found in other studies [8, 26, 45]. Our result probably could be explained by the fact that we had few people in each education category and the largest part of our sample had only elementary education, unlike other studies, in which the proportion between the categories of education was more equal.

Concerning the predictors of loneliness, in our study, not being married or not having a partner were risk factors for feeling more loneliness, supported by other studies [29, 31]. In addition, living alone was also a risk factor for loneliness, supported by other authors [29, 32]. Nyqvist et al. concluded that a better health perception is associated with the absence of loneliness. However, in our study there was no significant conclusion, which can be explained by the use of a different classification of the health perception scale, although it was used the same type of scale as in our study.

More than half of the participants of our study reported some level of loneliness, with higher values than those obtained in [27], as in a study from 2014 with data that included Portugal by Nyqvist et al. [31]. Regarding the months before the pandemic, we found that more than half of the participants reported worsening loneliness, with only 3.5% mentioning that it had improved. Kotwal et al. [48] observed an increase in loneliness due to COVID-19 in 54% of the participants, associated with worsening depression and anxiety. However, over the various phases of the study, there was an improvement in loneliness, becoming important to consider that there was a subgroup

that reported not having undergone changes since some were previously isolated and others learned coping and inclusion strategies and enjoy the tranquility.

In our study it was found that there was a direct association between anxiety and loneliness, like in the study of Ribeiro et al. [28], and that loneliness and depression were interconnected [26, 29, 32, 33, 42]. In context of a pandemic and with all the restrictions imposed, the social distance and loneliness that a significant part of the population was feeling could be the basis of the higher percentage of anxiety and depression symptoms. Although we cannot quantify the impact of the confinement in these variables, these numbers are worrying and should be object of reflection. Also, there is the possibility that part of the population may experience problems when they return to a lifestyle closer to normal, after the end of confinement and the pandemic.

Planchuelo-Gómez et al. [38] observed that a higher consumption of news and information about COVID-19 was a factor clearly associated with higher levels of anxiety, depression and stress, as in other study [49].

There seems to have been an increase in the use of technological means to update information about COVID-19, for entertainment and communication. Being familiar with technology became essential to be able to deal with restrictions, maintain social contacts and obtain medical supplies [48]. Although in the last few years the older Portuguese population became more familiar with technology and internet there is still a significant percentage that do not have the equipment required or the capacity to use it. This can be an area with great potential for possible interventions among the elderly.

4.1 Strengths

A strength of this study is its random sample of a specific population over 65 years old, living in Covilhã, a city of the interior of the country. As the data collection was carried out by phone, it allowed to reach individuals who would not have been included in the study, if it had been carried out through an online questionnaire, a method used in many of the studies that have emerged at this time. Besides that, it provided an understanding of the potential of these interviews through the dissemination, both of information on protective measures against COVID-19 and of psychological support numbers, seen by many of the participants as a way of fighting loneliness.

4.2 Limitations

The fact that it was not possible to cross our results with the clinical data of the participants, their usual medication and medical records and diagnoses, made it impossible to have a more complete view of each individual, in order to complement the subjective data reported by the participants.

The limited size of the sample, given that it focused on a specific population and is a longitudinal study, belonging to a city in the interior of the country, may not be representative of all the variability of the population of Portugal.

The telephone interviews did not allow to deepen some themes. In addition, the functional limitation of some participants, which made it impossible the response to the complete questionnaire, was an exclusion factor from our study.

Finally, the constraints of the variables' own assessment instruments, dependent on the subjective responses of each participant, combined with the lack of uniformity among the various studies analyzed, as well as the limited existence of studies aimed only at the elderly population, made it more difficult to compare our results and those obtained by other researchers.

4.3 Implications

This study warns of several problems and possible focus of intervention, for example, to create psychological support programs, to encourage the learning and the use of technological means, to combat loneliness and to facilitate the provision of assistance for this specific population. In addition, it would be important to develop strategies to streamline the daily life of the elderly population and to create a platform that allows those who are considered to be the most vulnerable and are at greater risk of developing mental disorders and loneliness, in order to minimize the effects of confinement, particularly in more advanced age groups.

It is important to repeat the study at a more advanced stage of the pandemic and after it ends, to assess the evolution of the population's mood and the long-term repercussions of it.

Along the study it was possible to conclude that there are people more resilient to changes and to the pandemic than others, so in the future it will be important to study the factors that help some people to deal with the confinement and all the uncertainty lived nowadays.

It would be interesting to conduct a study along these lines, with a population from other parts of the country, in order to assess the impact of the surrounding environment on the study variables, as well as on the way the elderly is facing the pandemic.

5. Conclusion

Based on our results, it was found that the elderly population living in Covilhã, a city in the interior of Portugal, has a high percentage of anxiety, depression and loneliness during the first outbreak of COVID-19, when several restrictions of leaving home and social meetings were imposed that could have aggravated these numbers. In addition, there are several factors, described throughout the study, that could influence these variables and are subject to change.

It is necessary to pay special attention not only to the physical consequences of imposed confinement and the pandemic, but also to have a clinically holistic view of this impact, with the inclusion of a psychological assessment of the population, in order to reduce the impact on the population's mental well-being.

Besides that, it is necessary to find strategies to combat the loneliness that resulted from confinement, since all these factors represent an increased risk of comorbidities, dependence and mortality, especially in the elderly, the sample population of our study, which by itself are in a position of greater vulnerability.

Although it is known that the use of technology can be a way to combat the impact of restrictions, it is necessary to bear in mind that the focus of intervention cannot be based exclusively on this, given the considerable percentage of the population without knowledge or access to equipment, so it is necessary to adapt programs to combat loneliness and existing mental disorders, so prevalent in this age group.

Thus, it is encouraged to carry out future studies only with the elderly on this topic, taking into account the particularities inherent to them.

Although there is not yet enough information to analyze the repercussions of long-term confinement, it is essential to be aware of the risk of increased mental disorders and loneliness during this period.

To this end, it is imperative to assess the mental state of the population in a post-pandemic period, in addition to providing and creating psychological support services, specialized in the elderly.

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