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'I feel old and have aging stereotypes'. Internalized aging stereotypes and older adults' mental health: the mediational role of loneliness

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ABSTRACT

Objectives: The main objective of this study was to analyze the role of aging stereotype activation (when older adults with aging stereotypes begin to consider themselves as older persons) in the relationship between ageist stereotypes, depressive, anxiety, loneliness, and comorbid anxiety-depressive symptoms.

Methods: Participants were 182 autonomous community-dwelling people between 60 and 88 (mean age = 72.30; SD = 5.53). Three path models were tested exploring the role of considering oneself as an older person as a moderator variable. Ageist stereotypes were included as the independent variable, loneliness as the mediating variable, and anxiety symptoms, depressive symptoms, and comorbid anxiety-depressive symptoms as dependent variables for each model.

Results: The results suggest an influence of ageist stereotypes on anxiety, depressive, and comorbid anxiety-depressive symptoms only in older adults who consider themselves as older persons, and mediated by loneliness.

Conclusion: This study suggests that, when someone considers him or herself as an older person, ageist stereotypes activate loneliness feelings, and this activation is associated with psychological distress, including anxiety, depressive, and comorbid anxiety-depressive symptoms.

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Aging stereotypes; loneliness; depressive symptoms; anxiety symptoms; comorbid anxiety-depressive symptoms

Aging self-stereotypes seem to play a relevant role in older adults' mental health. The association between negative aging self-stereotypes and worse mental health in old age has been widely reported in the literature (e.g. Levy et al., 2019; Losada-Baltar et al., 2022). For example, Levy et al. (2019) followed up adults over 55 years of age free of psychiatric conditions at the first assessment time point, and found that greater stereotypes towards aging at baseline were associated in the follow-up with new cases of anxiety and major depressive disorders (Levy et al., 2019).

Following the stereotype embodiment model proposed by Levy (2003, 2009), negative attitudes towards aging originate as aging stereotypes during childhood and are internalized and reinforced in adulthood (sometimes below conscious awareness), becoming aging self-stereotypes in old age (Levy, 2003). The activation of these stereotypes as self-stereotypes may be related to events associated with chronological age, such as retirement. Finally, when identifying as an older person, ageist stereotypes come to function as self-stereotypes (Levy, 2003). For example, Kornadt et al. (2021) found that the association between perceived ageism and worse subjective health was higher in those older adults who felt older. Another well-identified risk factor for anxiety and depressive symptoms during old age is loneliness (e.g. Domènech-Abella et al., 2019; Lee & Bierman, 2019), and aging self-stereotypes have been associated with greater loneliness in older adults (e.g. Coudin & Alexopoulos, 2010; Losada-Baltar et al., 2022; Santini et al., 2019). In fact, it has been proposed that one of the paths that could explain loneliness in old age is the stereotype embodiment (Shiovitz-Ezra et al., 2018), and therefore ageist self-stereotypes associated with loneliness may function as a self-fulfilling prophecy (Pikhartova et al., 2016). In other words, the frequent stereotypical belief that considers that older adults are lonely (Thornton, 2002) could be activated due to a negative life event habitually associated with aging (e.g. widowhood) and begin to function as ageist self-stereotype (Levy, 2003). For example, Bergman and Segel-Karpas (2021) found an association between fears and concerns regarding the aging process and loneliness for adults with high levels of ageism but not for those with low levels. Likewise, behaviors consistent with these stereotypical ideas may decrease the rate of reinforcing stimulus from the environment, something that, in turn, increases emotional distress, such as anxiety and depressive symptoms (Fiske et al., 2009). For example, through an 8-year longitudinal follow-up of a sample of adults over 50 years of age at baseline, Segel-Karpas et al. (2022) found an indirect effect of self-perceptions of aging on depressive symptoms through loneliness.

Anxiety and depression problems tend to appear together in older adults (Beekman et al., 2000; Saade et al., 2019). At the same time, loneliness has been associated with the comorbid presence of anxiety and depressive symptoms in older adults (Igbokwe et al., 2020; Palgi et al., 2020). Emotional comorbidity is a relevant issue for older adults, as it has been associated with several negative outcomes, such as less effectiveness of treatments for anxiety disorders (Abramowitz et al., 2000), greater memory impairment (DeLuca et al., 2005), poorer social function (Lenze et al., 2000; Stordal et al., 2003), or increased suicidal ideation and behavior (Jeste et al., 2006; Lenze et al., 2000; Saade et al., 2019). Nevertheless, despite the relevance

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of comorbid anxiety-depressive symptoms in old age, studies have hardly analyzed the factors associated with its appearance.

Considering the previously mentioned issues, the main objective of this study was to analyze the role of considering oneself as an older person in the relationship between ageist stereotypes, depressive, anxiety, loneliness, and comorbid anxiety-depressive symptoms. Following the findings mentioned in previous studies, and based on the stereotype embodiment model (Levy, 2003, 2009), we hypothesized: H1: Ageist stereotypes will be associated with anxiety, depressive, and comorbid anxiety-depressive symptoms; H2: Ageist stereotypes will be associated with loneliness; H3: The effect of ageist stereotypes on anxiety, depressive, and comorbid anxiety-depressive symptoms will be indirect through loneliness; and, H4: Ageist stereotypes will be associated with anxiety, depressive, and comorbid anxiety-depressive symptoms and loneliness only in older adults who consider themselves as older persons.

Method

Participants

A sample of 182 older adults between 60 and 88 years old participated in the present study. Inclusion criteria were (1) being 60 years of age or older, and (2) not showing explicit cognitive or functional impairment that prevents activities of daily life, as inferred by the trained assessors (psychologists with a Master degree in Clinical Psychology) through the course of the assessment. Participants were autonomous people living in the community, not using day care centers, home care, or other respite resources. Participants were recruited at centers in the community of Madrid (Spain) that offered activities and courses (e.g. painting, exercise, literature) for older adults. People must meet certain criteria to be users of these activities: (1) be registered in the municipality offering the course and, (2) be over 65 years of age, pensioners over 60 years of age or spouses or common-law partners of the previous groups. The majority participation in these activities is by women, making up 72% of the participants (Dirección General de Medios de la Comunidad de Madrid, 2019).

Variables and instruments

In addition to socio-demographic and health-related variables (gender, age, widowhood (yes/no), living alone (yes/no), reporting having an illness (yes/no), and self-perceived health (5-point Likert scale, from 0 'very bad' to 5 'very good')), the following variables were assessed.

Considering oneself as an older person

As an indicator of internalization of aging stereotypes, following the internalization process described by Levy (2003, 2009), the item 'Do you consider yourself an older person?', with dichotomous response format 0 'no' and 1 'yes', was evaluated.

Ageist stereotypes were evaluated with the Negative Stereotypes towards Old Age Questionnaire (CENVE; Blanca et al., 2005). The scale has 15 items (e.g. 'Most people over 65 have a series of disabilities that make them dependent on others'). All the items were answered on a 4-point Likert scale, from 1 'strongly disagree' to 4 'strongly agree'. The internal consistency (Cronbach's α) of the scale in the present study was .87.

Loneliness was assessed through the Spanish version (Pedroso-Chaparro et al., 2022) of the Three-Item Loneliness Scale (Hughes et al., 2004). The scale has 3-items (e.g. 'How often do you feel that you lack companionship?'). Response options consisted of a 3-point Likert scale, from 1 'hardly ever' to 3 'often'. The internal consistency (Cronbach's α) of the scale in the present study was .72.

Anxiety symptomatology was measured through the Spanish version (Márquez-González et al., 2012) of the Geriatric Anxiety Inventory (GAI; Pachana et al., 2007), a 20-item scale (e.g. 'I worry a lot of the time') with a dichotomous response option 0 'no' and 1 'yes'. The cut-off score established for clinical screening was 11 or more (Pachana et al., 2007). The internal consistency (Cronbach's α) of the scale in the present study was .91.

Depressive symptomatology was assessed through the Spanish version (Losada et al., 2012) of the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The scale has 20 items (e.g. 'I felt depressed') which measures depressive symptoms during the previous week. Response options consisted of a 4-point Likert scale with a range from 0 'rarely or none of the time' to 3 'most or all of the time'. The cut-off score established for clinical screening is 16 or more (Radloff, 1977). The internal consistency (Cronbach's α) of the scale in the present study was .85.

Data analysis

First, the sample was grouped into two symptom profiles of older adults according to the cut-off point of the CES-D (≥ 16) (Radloff, 1977) and the GAI (≥ 11) (Pachana et al., 2007) scales: 1) *Non comorbid* profile: low levels of depressive, anxiety, or both symptoms, and 2) *Comorbid* profile: high levels of both depressive and anxiety symptomatology. Also, descriptive exploration of the sample's sociodemographic variables was carried out. Then, the sample was divided into two groups (those not considering themselves as an older person and those considering themselves as an older person), and t-tests and chi-square tests were conducted to compare both groups in the assessed variables. The Kolmogorov–Smirnov test was used to test continuous variables for normality distributions. Following Schober et al. (2018), to analyze the relationship between variables, correlation analyses were performed in each of the groups using Pearson's statistic for normally distributed variables and Spearman's statistic for non-normally distributed variables. In addition, to test the hypothesis about the mediated moderation effect the PROCESS Model 8 was used. Three mediated moderation models were carried out following Hayes (2012). In these models, ageist stereotypes were included as an independent variable, considering oneself as an older person as a moderator variable, loneliness as a mediating variable and, as dependent variable anxiety symptoms, depressive symptoms, and comorbid anxiety-depressive symptoms, respectively for each model (see Figure 1), after controlling for socio-demographic and health-related variables (gender, age, widowhood, living alone, reporting having an illness, and self-perceived health). These models analyze the direct and indirect effects on the dependent variable on the high and low scores of the moderator (values 0 and 1 in the evaluated model). Conditional direct and indirect effects are statistically different from each other when the bootstrap confidence interval does not include zero. Following Field (2005), instead of linear regressions, logistic regressions were used for the dichotomous dependent variable comorbid anxiety-depressive symptoms. Thus, Nagelkerke's R^2 measures were reported.

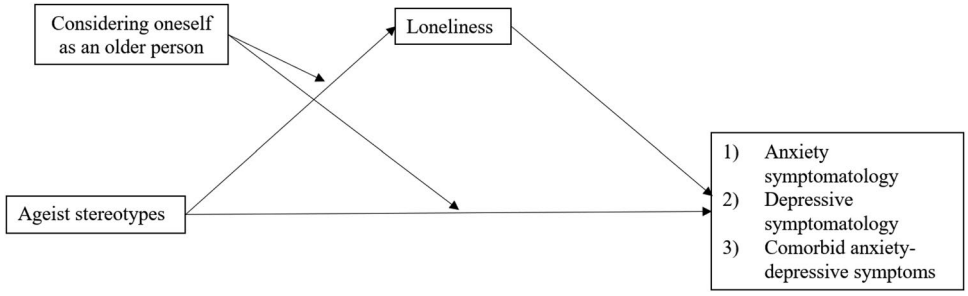

Figure 1. Overview of the hypothetical models of mediated moderation to predict (A) anxiety symptomatology (Model 1), (B) depressive symptomatology (Model 2), and (C) anxiety-depressive symptomatology (Model 3).

Table 1. Means, standard deviations, and differences between participants who did not consider themselves as older persons and those who did.

	Not considering oneself as an older person ($n = 90$)		Considering oneself as an older person ($n = 92$)				
	M	*SD*	*M*	*SD*	*t*	*p*	Cohen's d
Age	71.01	5.78	73.55	4.99	−3.18	0.002	−0.47
Self-perceived health	2.33	0.76	2.09	0.66	2.22	0.028	0.34
Ageist stereotypes	37.84	9.63	39.97	9.08	−1.53	0.126	−0.23
Loneliness	4.00	1.48	4.41	1.42	−1.89	0.061	−0.28
Anxiety symptomatology	8.01	5.65	10.04	6.08	−2.33	0.021	−0.35
Depressive symptomatology	16.16	9.35	19.89	10.90	−2.47	0.014	−0.37

Results

Sample characteristics

Participants were mainly women (76.40% women) with an age between 60 and 88 (mean age = 72.30; SD = 5.53). Of the 182 participants, 90 reported not considering themselves as an older person (range age = 60–88) and 92 reported considering themselves as an older person (range age = 61–86).

Differences between groups

No gender, widowhood, and living alone differences were found between those who did and those who did not consider themselves as older persons ($\chi^2(1)=3.38$, $p=0.066$), ($\chi^2(1)=0.31$, $p=0.580$), ($\chi^2(1)=1.75$, $p=0.186$), respectively. Also, no differences were found regarding the level of ageist stereotypes (t=-1.53, $p=0.126$) and loneliness (t=-1.89, $p=0.061$) among each group. However, it was found that the group of older adults who considered themselves as older persons were older (t=-3.18, $p=0.002$), more likely to report having an illness ($\chi^2(1)=7.17$, $p=0.007$), reported worse self-perceived health ($t=2.22$, $p=0.028$) and higher levels of anxious symptoms (t=-2.33, $p=0.021$) and depressive symptoms (t= −2.47, $p=0.014$) (Table 1). Finally, it was found that the group considering themselves as older person reported higher comorbid anxiety-depressive symptoms ($\chi^2(1)=5.17$, $p=0.023$).

Correlational results

As seen in Table 2, positive and significant correlations were found in the whole sample between ageist stereotypes and loneliness ($r=0.16$, $p<0.05$), anxiety ($r=0.18$, $p<0.05$), depressive ($r=0.26$, $p<0.01$), and comorbid anxiety-depressive ($r=0.18$, $p<0.05$) symptomatology. Also, positive and significant correlations were found between loneliness and anxiety ($r=0.37$, $p<0.01$), depressive ($r=0.43$, $p<0.01$) and comorbid anxiety-depressive ($r=0.37$, $p<0.01$) symptomatology.

Additionally, Table 2 shows the correlations of those who did not consider themselves as older persons and those who did. In participants who did not consider themselves as older persons, there were positive and significant correlations between loneliness and anxiety ($r=0.35$, $p<0.01$), depressive ($r=0.26$, $p<0.05$), and comorbid anxiety-depressive ($r=0.27$, $p<0.01$) symptomatology, but no significant associations were found in this group between ageist stereotypes and all the assessed variables ($p>0.05$). However, in participants who considered themselves as older persons, there were positive and significant correlations between ageist stereotypes and loneliness ($r=0.27$, $p<0.01$), depressive ($r=0.35$, $p<0.01$), and comorbid anxiety-depressive ($r=0.22$, $p<0.05$) symptomatology. Also, in this group there were positive and significant correlations between loneliness and anxiety ($r=0.34$, $p<0.01$), depressive ($r=0.55$, $p<0.01$), and comorbid anxiety-depressive ($r=0.39$, $p<0.01$) symptomatology.

Mediated moderation model

Three mediated moderation models were analyzed to explore the role of considering oneself as an older person, ageist stereotypes, and loneliness to predict anxiety, depressive, and comorbid anxiety-depressive symptoms, respectively (Figure 1). The three models shown in Table 3 explained a significant percentage of the variance in the dependent variables. The first model explained 26% of the variance in anxiety symptoms ($F(10, 171) = 6.11$, $p<0.01$, $R^2 = .26$). The second model explained 43% of the variance in depressive symptoms ($F(10, 171) = 12.83$, $p<0.01$, $R^2 = 0.43$). Finally, the third model explained 34% of the variance in comorbid anxiety-depressive symptoms ($\chi^2(10) = 50{,}40$, $p<0.01$, *Nagelkerke's* $R^2= 0.34$). The index of moderated mediation suggests that the indirect effects for those who did not consider themselves as an older person were significantly different from those obtained for participants who considered themselves an older person for all three models (First model: *Index* = 0.055, SE = 0.029, 95%CI:0.003 to 0.116; Second model: *Index* = 0.162, SE= 0.081, 95%CI: 0.009 to 0.332; Third model: *Index* = 0.025, SE= 0.015, 95%CI: 0.003 to 0.063; respectively).

Table 2. Correlations among study variables.

	Total sample ($n = 182$)						Group 1. Not considering oneself as an older person ($n = 90$)						Group 2. Considering oneself as an older person ($n = 92$)					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1. Age	–						–						–					
2. Self-perceived health	−0.02	–					0.05	–					0.01	–				
3. Ageist stereotypes	0.12	−.019**	–				0.05	−0.17	–				0.15	−0.19	–			
4. Loneliness	−0.02	−0.25**	0.16*	–			−0.07	−0.17	0.03	–			0.04	−0.27**	0.28**	–		
5. Anxiety symptomatology	−0.01	−0.24**	0.18*	0.37**	–		−0.07	−0.11	0.13	0.35**	–		−0.03	−0.33**	0.19	0.34**	–	
6. Depressive symptomatology	0.09	−0.35**	0.26**	0.43**	0.56**	–	−0.03	−0.32**	0.12	0.26*	0.53**	–	0.13	−0.37**	0.35**	0.55**	0.56**	–
7. Comorbid anxiety-depressive symptoms (1 = comorbid symptoms)	0.03	−0.32**	0.18*	0.37**	0.71**	0.71**	−0.01	−0.24*	0.12	0.27**	0.64**	0.72**	−0.01	−0.36**	0.22*	0.39**	0.74**	0.68**
Kolmogorov-Smirnov Z	4.39 ($p = 0.00$)	0.99 ($p = 0.28$)	3.27 ($p = 0.00$)	1.30 ($p = 0.07$)	1.29 ($p = 0.07$)	–	2.97 ($p = 0.00$)	0.74 ($p = 0.65$)	2.69 ($p = 0.00$)	1.06 ($p = 0.21$)	1.03 ($p = 0.24$)	–	3.17 ($p = 0.00$)	0.64 ($p = 0.81$)	2.23 ($p = 0.00$)	0.93 ($p = 0.35$)	0.77 ($p = 0.60$)	–

*$p < 0.05$; **$p < 0.01$.
Note. Pearson's statistics were used for normally distributed (Kolmogorov-Smirnov Z test; $p > 0.05$) variables and Spearman's statistic for non-normally distributed (Kolmogorov-Smirnov Z test; $p < 0.05$) variables (self-perceived health and loneliness).

Figure 2. Moderating effect of considering oneself as an older person on the relationship between ageist stereotypes and loneliness (common to the three models).

The first step was common to all three models (Table 3). Specifically, it was found that the interaction between ageist stereotypes and considering oneself as an older person was the only significant predictor of loneliness (Estimate = 0.049, SE = 0.022, *95%CI*: 0.005 to 0.092, $p > 0.05$). Thus, the findings suggest that the relationship between ageist stereotypes and loneliness is moderated by considering oneself as an older adult, as Figure 2 shows.

In the first model (Table 3, anxiety as an outcome), there was no evidence of a direct relationship between ageist stereotypes and anxiety symptoms, nor when these direct associations were analyzed separately in the participants who did not consider themselves as older and persons who did. Loneliness mediated the relationship between ageist stereotypes and anxiety symptoms only for participants who considered themselves as older adults (Estimate = 0.048, SE = 0.021, *95%CI*: 0.013 to 0.095). In the second model (Table 3, depression as an outcome), there was no evidence of a direct relationship between ageist stereotypes and depressive symptoms. Loneliness mediated the relationship between ageist stereotypes and depressive symptoms only for participants who considered themselves as older persons (Estimate = 0.141, SE = 0.058, *95%CI*: 0.041 to 0.265), as in the first model. In the third model (Table 3, comorbid anxiety-depressive symptoms as an outcome), there was no evidence of a direct relationship between ageist stereotypes and comorbid anxiety-depressive symptoms, nor when these direct associations were analyzed separately in the participants who did not consider themselves as older and those who did. As in the two previous models, loneliness mediated the relationship between ageist stereotypes and comorbid anxiety-depressive symptoms only for participants who considered themselves as older persons (Estimate = 0.022, SE = 0.012, *95%CI*: 0.006 to 0.052). These results suggest that ageist stereotypes are related to loneliness, anxiety, depressive, and comorbid anxiety-depressive symptoms only in older adults who consider themselves older persons.

Discussion

The main objective of this study was to analyze the association between aging stereotypes and mental health in healthy older adults who did not have explicit functional or cognitive

Table 3. Conditional process model analysis of the three hypothesized models.

	Loneliness					Anxiety symptomatology (Model 1)					Depressive symptomatology (Model 2)					Comorbid anxiety-depressive symptoms (Model 3)				
			95% CI					95% CI					95% CI					95% CI		
Model summary	Estimate	SE	LL	UL	*p*	Estimate	SE	LL	UL	*p*	Estimate	SE	LL	UL	*p*	Estimate	SE	LL	UL	*p*
Ageist stereotypes	−0.006	0.015	−0.037	0.024	0.683	0.069	0.059	−0.048	0.186	0.248	0.074	0.090	−0.104	0.257	0.413	0.026	0.031	−0.034	0.086	0.391
Considering themselves as an older person (0 = No)	−1.457	0.884	−3.203	0.289	0.101	3.370	3.441	−3.422	10.163	0.329	−3.067	5.257	−13.444	7.310	0.560	0.952	1.734	−2.452	4.356	0.584
Ageist stereotypes × Considering themselves as an older person	0.049	0.022	0.005	0.092	0.028	−0.037	0.086	−0.206	0.132	0.667	0.109	0.131	−0.150	0.367	0.407	−0.009	0.042	−0.093	0.074	0.826
Loneliness	–	–	–	–	–	1.140	0.295	0.559	1.721	0.000	3.339	0.450	2.451	4.227	0.000	0.512	0.139	0.239	0.7847	0.000
Gender (1 = woman)	0.028	0.259	−0.483	0.539	0.913	4.292	0.999	2.320	6.265	0.000	4.753	1.527	1.739	7.766	0.002	1.353	0.521	0.332	2.375	0.009
Age	−0.040	0.020	−0.080	−0.001	0.050	−0.008	0.079	−0.164	0.148	0.920	0.202	0.121	−0.036	0.440	0.096	0.021	0.041	−0.059	0.100	0.613
Widowhood (1 = widow)	0.328	0.313	−0.291	0.946	0.297	−2.877	1.213	−5.270	−0.482	0.019	−1.614	1.853	−5.271	2.043	0.385	−0.991	0.565	−2.098	0.115	0.079
Living alone (1 = living alone)	0.778	0.316	0.154	1.402	0.015	1.784	1.243	−0.669	4.237	0.153	−2.278	1.898	−6.025	1.469	0.232	0.154	0.562	−0.948	1.256	0.784
Having an illness (1 = having an illness)	0.029	0.215	−0.395	0.453	0.892	0.510	0.829	−1.127	2.146	0.540	0.721	1.267	−1.780	3.221	0.570	0.178	0.344	−0.595	0.951	0.651
Self-perceived health	0.358	0.150	0.062	0.654	0.018	0.840	0.588	−0.321	2.001	0.155	2.988	0.898	1.215	4.762	0.001	0.814	0.316	0.195	1.433	0.010
Condition Direct Effects																				
Not considering oneself as an older person						0.069	0.059	−0.048	0.186	0.248	0.074	0.090	−0.104	0.253	0.413	0.026	0.031	−0.034	0.086	0.391
Considering oneself as an older person						0.032	0.063	−0.093	0.157	0.617	0.183	0.097	−0.008	0.373	0.060	0.017	0.029	−0.041	0.074	0.565
Condition Indirect Effects																				
Not considering oneself as an older person						−0.007	0.021	−0.048	0.037		−0.021	0.061	−0.142	0.106		−0.003	0.011	−0.024	0.018	
Considering oneself as an older person						0.048	0.021	0.013	0.095		0.141	0.058	0.041	0.265		0.022	0.012	0.006	0.052	

Note: First step (loneliness regression) is common to all three models. CI = confidence interval. LL = lower limit. UL = Upper limit. Unstandardized coefficients are reported, bias corrected 95% CI, 5,000 bootstrap samples.

impairment. Previous studies have analyzed the relationship between aging self-stereotypes and psychological distress (Bryant et al., 2012; Freeman et al., 2016; Gendron et al., 2020; Levy et al., 2014; Levy et al., 2019, Losada-Baltar et al., 2022, O'shea et al., 2017; Sindi et al., 2012). However, this is the first study that analyzes different mental health associations of ageist stereotypes for older adults who reported not considering themselves as older persons and those who did. In support of the stereotype embodiment theory (Levy, 2003, 2009), our results suggest that the association between higher scores in ageist stereotypes and psychological distress in older adults is significant only in participants considering themselves as older persons; that is, in those participants who, by reporting that they considered themselves as older persons, may be showing indicators of having internalized ageist stereotypes as ageist self-stereotypes. Likewise, the fact that ageist stereotypes appear in both groups supports stereotype embodiment theory (Levy, 2003, 2009) about the origin of these stereotypes during childhood and internalization and reinforcement of these until begin activated as self-stereotypes in old age, as described by Levy (2003).

Also, the relationship between ageist self-stereotypes and comorbid anxiety-depressive symptomatology has not been analyzed in previous studies. Hence, one of the main contributions of the present work is the finding that comorbid anxiety-depressive symptoms were associated with indicators of the activation of ageist stereotypes as self-stereotypes towards aging, again as depicted by the stereotype embodiment model proposed by Levy (2003, 2009). Considering the results of previous studies that have shown an association between anxious-depressive comorbidity and more suicidal ideation and behavior (Jeste et al., 2006; Lenze et al., 2000; Saade et al., 2019), this finding may be especially important as more than half of all suicides globally occur in adults over 50 years of age (World Health Organization, 2021).

In the same way, our findings are coherent with previous studies (e.g. Domènech-Abella et al., 2019; Igbokwe et al., 2020; Palgi et al., 2020) in the observed associations between loneliness and greater anxiety, depressive, and comorbid anxiety-depressive symptoms in older adults. In this study, ageist stereotypes were associated with loneliness only in the group of participants who considered themselves as older persons; that is, the results suggest that ageist self-stereotypes were associated with greater loneliness, in a similar way as has been reported in previous qualitative (e.g. Pikhartova et al., 2016) and quantitative (e.g. Beyene et al., 2002) studies.

Finally, the obtained results suggest that loneliness mediates the association between ageist self-stereotypes and anxiety, depressive, and comorbid anxiety-depressive symptoms, consistent with the indirect effect of self-perceptions of aging on depressive symptoms through loneliness found by Segel-Karpas et al. (2022). These results can be explained following the self-fulfilling prophecy proposed by Pikhartova et al. (2015). Older adults who internalize ageist stereotypes could understand old age as a stage with less social contact and greater loneliness (e.g. 'Older people have fewer friends than younger ones'; Blanca et al., 2005) and, consequently, this could increase loneliness and/or decrease social contact, they may contribute to decreasing behavioral activation, and, therefore, increase anxiety, depressive, and comorbid anxiety-depressive symptoms.

It is important to note that this study has limitations that highlight the need for additional studies confirming the obtained results. First, the sample size and convenience nature of the sampling process does not allow generalization of the findings to the general older adult population. For example, the study sample is made up of older adults who attended centers in the community offering activities and courses for older adults. Particular characteristics have been found in those who attend these centers, such as a greater likelihood of being female or having less income or caregiving tasks (Pardasani, 2010). Second, no measures of functional and cognitive status were used. Third, the cross-sectional nature of the study does not allow causal inferences regarding the direction of the results, such as the mediating role of loneliness in the association between ageist self-stereotypes and depressive symptoms to be confirmed. For example, Santini et al. (2019) analyzed cross-sectional data from a large sample of adults over 50 years of age and found support for an alternative conclusion to the one proposed in the present study. Their results suggest that the integration in social support networks and the improvement of the quality of the relationships can potentially reduce the degree to which older people embrace negative perceptions of aging. Furthermore, even when support has been found for the potential of loneliness to be a mechanism of action in the effects of ageist self-stereotypes on psychological distress, there are other potential candidates to play this mediating role that have not been addressed in this study, such as satisfaction with support (Cheng, 2017). Finally, it is necessary to mention that this study was carried out considering established cut-off points in anxiety and depression scales to determine the presence of comorbid anxiety-depressive symptoms; therefore, these cut-off points influence the number of older adults being classified with significant anxious and depressive symptomatology.

Despite these limitations, this study is presented as a first and preliminary approach to the analysis of the role of ageist stereotypes in loneliness and anxiety, depressive and comorbid anxiety-depressive symptoms as moderated by the self-perception as an older adult. The obtained results suggest that indicators of the internalization and activation of ageist stereotypes as self-stereotypes (in older adults who consider themselves as an older person) plays a significant role in the development of psychological distress, including anxiety, depressive, and comorbid anxiety-depressive symptoms, with loneliness playing a mediating role in this association. Considering the negative consequences associated with comorbid anxiety-depressive symptoms in older adults (e.g. increased suicidal ideation and behavior; Jeste et al., 2006; Lenze et al., 2000; Saade et al., 2019), the findings of this study suggest potential pathways that may contribute to understanding, preventing and treating negative psychological symptoms in older adults.

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Disclosure statement

The authors have no conflicts of interest to disclose.

Ethical consideration

All participants signed an informed consent that included information about their voluntary participation, anonymity, no potential for harm,

and information about results. The study was approved by the Ethics Committee of the Rey Juan Carlos University (Reference number: 2602201804518).

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