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Emotion regulation processes as mediators of the impact of past life events on older adults' psychological distress

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11 ABSTRACT

Objective: Although it is known that certain emotion regulation processes produce a buffering effect on the relationship between life events and well-being, this issue has been poorly studied in the elderly population. Thus, the aim of the present study is to test and confirm a comprehensive model of the impact that past life events have on older adults' psychological distress, exploring the possible mediating roles of emotion regulation processes. These include rumination, experiential avoidance, and personal growth.

Methods: In this cross-sectional study, 387 people over 60 years old residing in the community were assessed on life events, physical functioning, emotion regulation variables, psychological well-being, as well as symptoms of anxiety and depression.

Results: The structural model tested achieved a satisfactory fit to the data, explaining 73% of the variance of older adults' psychological distress. In addition, the main results suggest possible mediation effects of both the physical functioning and the emotional variables: rumination, experiential avoidance, and personal growth in the face of hardship.

Conclusions: These findings confirm the importance of emotion regulation processes in the final stages of life. They reveal the various adaptive and maladaptive mechanisms that underlie the relationship between life events and psychological distress. The findings suggest – both in the explanatory models of psychological well-being and in psychotherapeutic interventions – the importance of emotion regulation in the elderly population's health.

Key words: life events, psychological well-being, emotion regulation, personal growth, depressive symptoms, older adults

31 Introduction

32 Aging is a process characterized by numerous
33 changes that affect several facets of a person's
34 life (Baltes *et al.*, 1998; Rebok *et al.*, 2014). Many
35 of these changes can cause considerable stress, such
36 as the death of a family member, personal illness,
37 or that which affects loved ones (McCarthy *et al.*,
38 2016).

39 Adverse life events have a negative impact on
40 physical health variables (Cohen *et al.*, 2018; Thoits,
41 2010). Thus, in middle-aged adults, their predictive

role has been demonstrated on somatic symptoms 42
(Lerebours *et al.*, 2007; Tak, *et al.*, 2015), lower 43
levels of physical activity (Yoshiuchi *et al.*, 2010), or 44
changes in the immune system (Reed and Raison 45
2016). In older adults, it is linked to general health 46
status, diverse physical and chronic symptoms, 47
and vulnerability to cardiovascular disease (Cutrona 48
et al., 1986; Vogelzangs *et al.*, 2007; Wong and 49
Waite, 2016). More specifically, and regarding 50
the study variables, it has also been found that 51
negative life events inversely predict physical func- 52
tioning (assessed by performing basic and instru- 53
mental activities of daily living) in older people 54
(Cutrona *et al.*, 1986; Krause *et al.*, 2004; Wong 55
and Waite, 2016). 56

Moreover, several studies demonstrate the 57
impact of life events on the psychological health 58

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59 of both healthy (Sun *et al.*, 2017) and clinical
60 individuals (Blonski *et al.*, 2016). There is a consensus
61 that life events, regardless of when they transpired,
62 play a major role in predicting anxiety, depressive
63 symptomatology, and well-being in the elderly popu-
64 lation (Dulin and Passmore, 2010; Monserud and
65 Markides, 2017; Shrira *et al.*, 2012). These findings
66 are consistent with those reported among older adults
67 in longitudinal studies (Pruchno *et al.*, 2017).

68 When these life events occur, the person adopts
69 coping mechanisms. According to the stress model
70 developed by Lazarus and Folkman (1984), upon
71 which this work is based, a person's response to
72 a stressful situation depends on their cognitive
73 evaluation of it. Once a person has defined a situa-
74 tion as stressful, two coping strategies may unfold:
75 (a) problem-focused strategies involve concentrat-
76 ing on reducing or managing the source of stress, in
77 cases where it can be modified; (b) emotion-focused
78 strategies, which have been found to be more effec-
79 tive when the stressor cannot be modified seek
80 to reduce negative emotions by modifying the way
81 in which the stressful situation is evaluated (Lazarus
82 and Folkman, 1984). Later, Folkman (2008) suggests
83 a third type of coping strategy, which occurs when
84 the distress continues even though some of the
85 aforementioned coping strategies have already
86 been initiated: meaning-focused coping (Folkman,
87 2008). In this case, the person returns to their beliefs
88 (e.g. religious or spiritual), values (e.g. "mattering"),
89 or existential achievements (e.g. purpose in life) to
90 change the meaning of a stressful life event. In other
91 words, they mentally redefine a negative event as
92 holding a useful purpose (Folkman, 2008). Among
93 the variables of psychological health in which the
94 adequacy of this theoretical model has been verified
95 are depression (Sun *et al.*, 2017) or psychological
96 well-being (Buunk *et al.*, 2013), showing how
97 such regulatory strategies soften or accelerate the
98 negative impact that stressors have on well-being
99 or depression.

100 There has been considerable research on the
101 stress model (Lazarus and Folkman, 1984), con-
102 firming the mediating role of coping strategies
103 between the occurrence of negative events and
104 mental health. Thus, emotion-focused coping would
105 be identified by variables of emotion regulation
106 (Michl *et al.*, 2013; Laloyaux *et al.*, 2016) and
107 meaning-focused coping would be linked to the
108 protective role of positive variables, such as personal
109 growth or the meaning in life, when faced with
110 stressful events (Triplett *et al.*, 2012). Furthermore,
111 it must be emphasized the importance of analyzing
112 not only the role that present life events play in a
113 person's well-being, but also the lasting psycho-
114 logical impact of events that occurred previously in
115 older individuals' lives (Dulin and Passmore, 2010;

Shrira *et al.*, 2012). Since it is in this last vital stage
116 that the greatest number of damaging vital events
117 occur, the effects of which are especially negative
118 (e.g. illness, widowhood . . .), it could be said that
119 one's ability or inability to cope with previous life
120 events is an accurate predictor of depression and
121 anxiety in old age (Dulin and Passmore, 2010).
122

123 Among the various determinants of psychological
124 distress, studies have consistently found that certain
125 emotion regulation processes, such as rumination,
126 have a negative impact on physical and psychologi-
127 cal health (Aldao and Nolen-Hoeksema, 2012).
128 In particular, rumination is defined as the tendency
129 to focus attention on one's own depressive symp-
130 toms and to have repetitive thoughts about the
131 causes of such symptoms and/or the situation or
132 event that generated them, as well as about the
133 negative consequences of that situation or event
134 and of the symptoms themselves (Abramson *et al.*,
135 1989). Likewise, rumination has been also under-
136 stood as an emotion regulation strategy automati-
137 cally displayed by the person as a response to the
138 normal emotion of sadness (Nolen-Hoeksema
139 *et al.*, 2008). This process has been linked numer-
140 ously to negative physical effects (Verkuil *et al.*,
141 2010) as well as psychological health (Topper *et al.*,
142 2017). These results have been confirmed in older
143 adults, with various studies linking negative associa-
144 tions to emotional health (Segerstrom *et al.*, 2015).
145 A fixation on past negative life events strongly corre-
146 lates to depressive symptomatology (Connolly and
147 Alloy, 2018; Eisma *et al.*, 2017; Michl *et al.*, 2013;
148 Ruscio *et al.*, 2015). Individuals who ruminate
149 more frequently over past life events report feeling
150 higher levels of distress (Vanderhasselt *et al.*, 2016);
151 and, prolonged rumination is a predictor of
152 future depressive episodes (Stange *et al.*, 2016).
153 Specifically, Moberly and Watkins (2008) have
154 suggested that ruminative thinking is the explana-
155 tory mechanism of the association between negative
156 events and depressive mood states (Moberly and
157 Watkins, 2008). The authors suggest that rumination
158 on life events could be mediating between the effects
159 of past negative life events on people's present life
160 and the persistence of negative affect (Connolly and
161 Alloy, 2018; Moberly and Watkins, 2008).

162 Another determinant of psychological distress,
163 analyzed extensively in recent years, is experiential
164 avoidance. It is defined as the behavioral attempts
165 to alter the form and frequency of unwanted
166 thoughts, emotions, and sensations, with the aim of
167 not being in contact with them (Hayes *et al.*, 2004).
168 Experiential avoidance has been associated with
169 anxious and depressive symptomatology in both the
170 general (Berghoff *et al.*, 2017; Chou *et al.*, 2018) and
171 elderly population (Ferguson *et al.*, 2017). Numerous
172 studies have found associations between experiential

173 avoidance and depressive or anxious symptoma-
174 tology (Bardeen and Fergus, 2016; Nam, 2016).
175 This suggests that an avoidance of traumatic event
176 memories mediates the association between the
177 traumatic experience and anxious and depressive
178 symptoms (Dulin and Passmore, 2010).

179 Finally, it is important to note that the experience
180 of life events can lead to a positive impact (not only
181 negative) in a person's life. On one hand, some
182 studies argue that the experience of some positive
183 life events can have a comforting or beneficial effect
184 on physical and psychological health (Kleiman *et al.*,
185 2014). This fits perfectly with the aforementioned
186 stress model of Lazarus and Folkman (1984), in
187 which this work is framed. Specifically, it models
188 the third method of coping, which assigns higher
189 meaning to the events in life (Folkman, 2008). With
190 regard to negative life events, both transversal
191 (Bonanno *et al.*, 2011) and longitudinal studies
192 (Dekel *et al.*, 2012) have revealed how living through
193 these events can give rise to personal growth.
194 Previous studies suggest that the ability to recover
195 from traumatic experiences and extract benefits
196 from them has been linked to lower levels of depres-
197 sive symptomology, better psychological well-being,
198 and positive effects on relationships with others
199 (Bernstein *et al.*, 2017).

200 This work stems from the idea that much of the
201 current psychological distress in the elderly population
202 could be explained by maladaptive emotion regulation
203 processes over past negative life events (Bardeen
204 and Fergus, 2016; Moberly and Watkins, 2008).
205 The present study aims to explore the impact of the
206 elderly's past life events on their current psychological
207 distress levels. It analyses the role that adaptive and
208 maladaptive emotion regulation variables play in
209 this relationship. Thus, the main objective of the study
210 is, based on the aforementioned literature, to test a
211 comprehensive structural equation model (SEM) that
212 includes those emotion regulation and dysregulation
213 variables of the elderly people that act as mediators of
214 the relationship between life events and psychological
215 distress. Specifically, it is hypothesized that rumination
216 (understood as a generally stable trait), experiential
217 avoidance tendency, rumination associated with life
218 events (understood as specific ruminative thoughts
219 about past life events), and personal growth associated
220 with life events will mediate and contribute in a
221 significant way to the explanation of the older adults'
222 psychological distress.

223 **Methods**

224 **Participants and procedure**

225 A sample of 388 people over the age of 60 years
226 (70.2% women) residing in Madrid (Spain) with an

average age of 71.5 years (SD = 6.9; range 60–92) 227
participated in this cross-sectional study. The aver- 228
age number of years of formal education received 229
was 12.2 (SD = 7.3). Of these, 51.4% were married, 230
28.2% widowed, 15.3% single, and 5.1% divorced/ 231
separated. Nine percent considered their health to 232
be “very good,” 32.3% “good,” 49.4% “normal,” 233
7.9% “bad,” and 1.3% “very bad.” All participants 234
were recruited through the Red Cross Reina 235
Sofia Senior Centres and were residents in the 236
community. The subjects gave their written informed 237
consent after receiving information about the study 238
procedure, following at all times the principles of the 239
Helsinki Declaration (59th General Assembly of the 240
World Medical Association, Seoul, October 2009) 241
for research involving human subjects. The project 242
was approved by the Ethics Committee of the Spanish 243
Red Cross. The evaluations, made by trained psy- 244
chologists, took approximately 40–50 minutes per 245
participant. 246

247 **Variables and instruments**

248 The analyzed variables are presented below, orga- 248
nized using the stress and coping model (Lazarus 249
and Folkman, 1984): stressors, health mediator 250
variables, emotion regulation mediator variables, 251
and outcome variables (psychological distress 252
variables). 253

254 **STRESSORS**

255 Occurrence of life events was measured using the 255
Occurrence of Life Events Subscale (OLVS) of the 256
Scales for the Evaluation of the Psychological Impact 257
of Life Events (SEPILE; Fernández-Fernández *et al.*, 258
2013). This instrument evaluates the occurrence of 259
certain positive (OLVS+) and negative (OLVS-) 260
life events (e.g. loss of a family member, illness, etc.) 261
throughout life, using a dichotomous response (yes/ 262
no). The internal consistency is acceptable in terms of 263
the global scale (Kuder–Richardson – KR-20- = .70) 264
and the subscales (KR-20 = .50 for OLVS+; 265
KR-20 = .64 for OLVS-), indices that are appropri- 266
ate when dealing with event accumulation scales 267
(Browne and Cudeck, 1993). 268

269 **HEALTH MEDIATOR VARIABLES**

270 Physical function was evaluated with the Medical 270
Outcome Study 36-Item Short-Form Health Survey 271
(SF-36; Ware and Sherbourne, 1992; Spanish 271
version by Alonso *et al.*, 1995), using a 10-item 272
subscale with a 3-point Likert response format. 273
This subscale evaluates people's perception of their 274
ability to carry out certain daily activities and have an 275
adequate internal consistency in the Spanish version 276
($\alpha = .84$). In this work, a good internal consistency 277
index was achieved ($\alpha = .84$). 278
279

280 EMOTION REGULATION MEDIATOR VARIABLES

281 Ruminative tendency was evaluated using the short
282 version of the Ruminative Response Styles Ques-
283 tionnaire (Jackson and Nolen-Hoeksema, 1998), a
284 10-item scale with a 4-point Likert response format
285 which evaluates the propensity for rumination
286 thoughts when the person is feeling sad, melan-
287 cholic, or dejected. This instrument has proven an
288 excellent internal consistency in the older popula-
289 tion ($\alpha = .91$). In this study, a high internal consis-
290 tency index was also achieved ($\alpha = .89$).

291 Experiential avoidance was evaluated using the
292 Acceptation and Action Questionnaire (Hayes *et al.*,
293 2000; Spanish version by Barraca, 2004), which
294 evaluates a person's unwillingness to get in touch
295 with particular private experiences, as well as
296 their attempts to change the form or frequency of
297 these events and the context that can cause them.
298 The authors of this 9-item scale with a 7-point Likert
299 response format report an acceptable internal
300 consistency ($\alpha = .70$) (Hayes *et al.*, 2000). A low inter-
301 nal consistency was achieved in this work ($\alpha = .62$).

302 Ruminative thinking on life events was measured
303 with the Evaluation of Ruminative Thinking on
304 Life Events Subscale, including in the SEPILÉ
305 (Fernández-Fernández *et al.*, 2013). This assesses
306 the level of repetitive thinking that creates emotional
307 distress regarding the past life events previously
308 evaluated with the OLVS. This scale has a 4-point
309 Likert response format and shows high internal
310 consistency (ordinal alpha = .88) in the present
311 study, as presented by the authors of the original
312 version (Fernández-Fernández *et al.*, 2013).

313 Personal growth associated with life events
314 was evaluated with the Subscale of Personal
315 Growth Linked to Past Life Events of the SEPILÉ
316 (Fernández-Fernández *et al.*, 2013). This scale has a
317 4-point Likert response format and assesses the
318 degree to which a person perceives they have experi-
319 enced some kind of personal growth after experiencing
320 life events. In this work, this scale has a high internal
321 consistency (ordinal alpha = .87), as presented by the
322 authors of the original version (Fernández-Fernández
323 *et al.*, 2013).

324 OUTCOMES: PSYCHOLOGICAL DISTRESS
325 VARIABLES

326 Psychological well-being was measured using
327 the Psychological Well-being Scales of Ryff (Ryff,
328 1989; Spanish adaptation by Díaz *et al.*, 2006). This
329 39-item scale with a 5-point Likert response format
330 contains six subscales (purpose in life, environmen-
331 tal mastery, positive relationships with others,
332 self-acceptance, autonomy, and personal growth);
333 however, in the present study, the total score was
334 used. The authors of the original version (Díaz *et al.*,
335 2006) report an adequate internal consistency

(α ranging between .70 and .84). In this study, a
high internal consistency index was achieved ($\alpha = .87$).

338 Depressive symptomatology was evaluated with
339 the Depressive Symptomology Scale of the Centre
340 for Epidemiological Studies (Radloff, 1977). This
341 20-item scale with a 4-point Likert response format
342 assesses the frequency of the appearance of depres-
343 sive symptoms over the previous week. This instru-
344 ment has proven high internal consistency in both
345 the general population ($\alpha = .85$) and the clinical
346 population ($\alpha = .90$). In this work, a good internal
347 consistency index was also achieved ($\alpha = .84$).

348 Anxiety was measured using the Geriatric
349 Anxiety Inventory (Pachana *et al.*, 2007; Spanish
350 adaptation by Márquez-González *et al.*, 2012),
351 which evaluates symptoms of anxiety in the older
352 population. This 20-item instrument with a dichoto-
353 mous response format shows high internal consistency
354 ($\alpha = .91$) in the present study, as presented by the
355 authors of the original version (Pachana *et al.*, 2007).
356

357 **Data analysis**

358 Statistical analyses were done with IBM SPSS
359 version 22 and IBM SPSS AMOS version 22
360 (Armonk, NY, USA).

361 To explore the mediating links among variables
362 and the adjustment of the theoretical model to the
363 data, SEM was used, due to its suitability to examine
364 mediation relationships between multiple variables
365 (Bollen, 1987). Specifically, this work follows a strictly
366 confirmatory approach (Garson, 2012), in order to
367 test the adequacy of a theoretical model based on
368 previous research.

369 As a preliminary step, it was made sure that the
370 missing values appeared to be missing completely at
371 random (MCAR), noting that said data did not
372 exceed 5% of the total sample, so that the reliability
373 was not compromised (Graham, 2009). Similarly,
374 following the recommendation (Garson, 2012), it
375 was decided to eliminate those cases with missing
376 values (listwise deletion), which slightly reduced
377 the size of the sample to 387 subjects. Later, the
378 assumption of multivariate normality was checked,
379 finding a normal Mardia coefficient of 2.67,
380 which indicates the existence of data normality
381 (Ullman, 2006).

382 In order to analyze if the sample size was adequate
383 to use SEM methodology in a model of this nature,
384 the Hoelter index was used. Thus, the value of 368
385 ($p = .05$) showed the adequacy of the sample size,
386 since it was above 200 (Garson, 2012).

387 Using the maximum likelihood estimation
388 method, the model goodness of fit was measured
389 by (1) the indices of absolute fit Chi square and its
390 degrees of freedom (df) and p value, the Standard-
391 ized Root Mean Square Residual (SRMR) and the

AQ9

AQ11

AQ10

AQ12

Table 1. Bivariate correlations between variables

	1	2	3	4	5	6	7	8	9	10
Positive events	–									
Negative events	.42	–								
Physical function	.08	-.15	–							
Experiential avoidance tendency	-.03	.09	-.20	–						
Rumination tendency	-.02	.19	-.42	.58	–					
Personal growth associated with life events	.18	-.03	.15	-.07	-.09	–				
Rumination associated with life events	-.16	.23	-.19	.35	.43	.04	–			
Depression	-.17	.13	-.40	.47	.60	-.20	.41	–		
Anxiety	-.16	.06	-.23	.45	.49	-.15	.26	.48	–	
Psychological well-being	.17	-.07	.30	-.53	-.48	.20	-.31	-.56	-.46	–

Correlations that are significant at $p < .01$ are in bold.

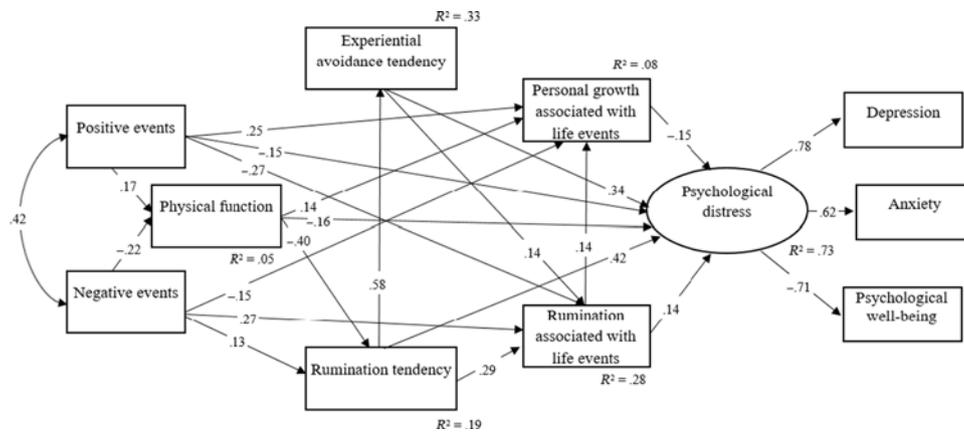


Figure 1. Final path model of the analyzed variables. *Note.* All the path coefficients are standardized, showing only those that are significant. The numbers in bold are the R^2 coefficients of the endogenous variables.

392 Root Mean Square Error of Approximation (RMSEA)
 393 with the 90% confidence interval; and (2) the Com-
 394 parative Fit Index (CFI), as an incremental fit index.
 395 An acceptable model fit was defined Chi square
 396 p value $\geq .05$, SRMR $\leq .05$, RMSEA $\leq .05$, and
 AQ13 397 CFI $\geq .95$ (Garson, 2012; Hooper *et al.*, 2008).
 398 Additionally, to quantify the contribution of each
 399 predictor to the psychological discomfort levels,
 400 Cohen's f^2 was calculated as a local effect size measure,
 401 with values of .02, .15, and .35 representing small,
 AQ14 402 medium, and large effect sizes, respectively (Cohen,
 403 1988).

404 Finally, to explore the common method variance
 405 issue, Harman's single-factor test (Podsakoff *et al.*,
 406 2003) was used.
 407

408 **Results**

409 **Correlation analysis**

410 Regarding the outcomes variables as seen in Table 1,
 411 depressive symptomatology is significantly related
 412 to all the study variables. With regard to psycho-
 413 logical well-being and anxiety, statistically significant

relationships have been found with almost all vari- 414
 ables, except for the occurrence of negative life events. 415

In addition, physical functioning is significantly 416
 associated with all the variables studied, except 417
 positive life events. Regarding emotion regulation vari- 418
 ables, the following results were found. Rumination 419
 tendency demonstrated statistically significant asso- 420
 ciations with all the variables, except for positive life 421
 events. Experiential avoidance tendency has been asso- 422
 ciated in the expected direction with all the analyzed 423
 variables, except with life events and personal growth. 424
 Rumination associated with life events was significantly 425
 related to all variables, except for personal growth; 426
 and personal growth associated with life events was 427
 not correlated with either the negative life events or the 428
 emotional variables discussed above, but it was related 429
 to the rest of the variables. 430

431 **Explanatory model of psychological distress**

432 Based on the proposed stress and coping model 432
 (Lazarus and Folkman, 1984), a SEM model has 433
 been carried out (Figure 1). Following the recom- 434
 mendations of Jöreskog (1993), only those relation- 435
 ships that have turned out to be significant in the 436

Table 2. Adjustment indices for the proposed model

χ^2	df	<i>p</i>	CFI	RMSEA	RMSEA 90% CI	SRMR
34.821	22	.040	.988	.039	[.008–.062]	.030

90% CI = 90 percent confidence interval.

Table 3. Local effect size of the variables that directly predict psychological distress

PREDICTOR VARIABLE	COHEN'S f^2
Positive events	.07
Physical health	.07
Experiential avoidance tendency	.28
Rumination tendency	.31
Personal growth associated with life events	.07
Rumination associated with life events	.04

437 final model are presented in the figure. The fit
438 indices obtained when analyzing the structural
439 model show an excellent adjustment of the data
440 to the model (see Table 2). The main relationships
441 between the study variables, including both direct
442 and indirect effects, are discussed in more detail
443 below.

444 It can be observed that positive life events, as
445 well as emotion regulation and dysregulation vari-
446 ables, directly affect levels of psychological distress.
447 Specifically, positive life events, in addition to their
448 direct (inverse) influence on psychological distress,
449 also have an indirect effect on this variable through
450 their relationship with physical function, personal
451 growth, and ruminative thinking about life events.

452 On the other hand, the occurrence of negative life
453 events affects distress only indirectly, through most
454 emotion regulation variables, suggesting the medi-
455 ating role of these latter variables. Specifically, neg-
456 ative life events affect psychological distress through
457 emotion regulation (personal growth associated with
458 life events) and dysregulation processes (ruminative
459 tendency, ruminative thinking about life events), as
460 well as through physical function.

461 All the variables of emotional dysregulation intro-
462 duced in the model contribute significantly in a
463 direct and positive manner to explain the variance of
464 psychological distress. On the other hand, the per-
465 sonal growth associated with life events also makes a
466 statistically significant contribution, but in an inverse
467 way to explain the psychological distress, as well as
468 the physical function.

469 Regarding the contribution made by each of the
470 variables that directly affect the levels of psycho-
471 logical distress, local effect sizes that range from small
472 to medium are found (see Table 3). Finally, the results
473 of Harman's single-factor test ($\chi^2 = 448.348$, $df = 36$,

$p < .001$; CFI = .617; RMSEA = .172 [.158–.186]; 474
SRMR = .164) showed that a single factor could not 475
account for the variance in the data, suggesting that 476
common method variance bias was not a relevant 477
problem in the present study. 478

To summarize, as can be seen in Figure 1, the 479
variables of the model explain 71% of the variance in 480
psychological distress. In addition, it is important to 481
note that the modification indices examined do not 482
suggest the existence of any relationship not previ- 483
ously considered among the study variables. 484
485

Discussion

486
The objective of this study was to test a comprehen- 487
sive model to analyze the impact of life events on the 488
psychological distress of older adults, and to discern 489
what role different emotion regulation and dys- 490
regulation processes play in the relationship. The 491
hypothesized model comprised stressor variables 492
(i.e. positive and negative life events), mediating 493
variables (i.e. physical function, emotion regulation, 494
and dysregulation variables such as experiential 495
avoidance tendency, rumination tendency, personal 496
growth related to life events, and rumination asso- 497
ciated with life events), and an outcome variable 498
(psychological distress). It was found that both the 499
occurrence of life events and the emotion regulation 500
processes explain a high percentage of variance 501
in psychological distress, showing the theoretical 502
model an excellent fit to the data. 503

504 Specifically, positive life events appeared to con- 505
tribute significantly, both directly and indirectly, 506
through physical function, rumination associated 507
with life events, and personal growth associated 508
with life events, to explain psychological distress. 509
These findings are in line with those studies that 510
provide evidence of the protective role of positive 511
life events on psychological and physical health 512
(Kleiman *et al.*, 2014; Luhmann *et al.*, 2012), 513
suggesting that the impact of positive life events 514
on psychological distress is partially mediated by 515
emotional regulation and dysregulation processes 516
and by physical functioning.

517 On the other hand, regarding negative life events, 518
the results suggest that the detrimental impact 519
on psychological distress is not direct but is being 520
exercised through both the emotion regulation 521
processes and physical function. This possible 522
mediation effect is substantiated by some authors 523
who argue that the disruption of adaptive emotion 524
processes represents the mechanism linking the expe- 525
rience of negative events across life to experienced 526
distress (Abravanel and Sinha, 2015). This study 527
extends these findings to the older adult population 528
and adds other emotion regulation variables, with the

529 capacity to determine the levels of psychological dis-
530 tress experienced.

531 **Impact of emotion regulation processes** 532 **on psychological distress**

533 By specifically addressing the emotion dysregulation
534 processes, the results might entail that elderly adults'
535 rumination tendency maintains a substantial impact
536 on psychological distress, even when controlling for
537 the other emotion regulation variables. In addition,
538 our findings suggest that rumination style acts as
539 a mediator on the detrimental effect that negative
540 life events have on distress. Although our results are
541 in line with those who argue that rumination is a
542 harmful adaptation to stressful events (Michl *et al.*,
543 2013), it is interesting to know the mechanisms
544 that enable it. Some authors have proposed that
545 ruminative thoughts increase sensitivity to stressful
546 events through a deterioration in affectivity, a vari-
547 able capable of increasing anxious and depressive
548 symptoms in the face of such events (Ruscio *et al.*,
549 2015).

550 The experiential avoidance tendency variable
551 does not seem to have a direct mediating role in
552 the effect of life events on psychological distress, but
553 it does act as a mediator in the relationship between
554 rumination tendency and psychological distress.
555 It plays an essential role in explaining this outcome
556 variable. The explanation for this could be, as some
557 authors propose (Nolen-Hoeksema *et al.*, 2008),
558 rumination serves to establish that experienced
559 situations have no remedy, which causes the person
560 decides to opt for inaction and avoidant coping. As a
561 consequence, the individual would have a greater
562 difficulty participating in behaviors which could
563 potentially repair the mood generated by the mem-
564 ory of the event (Ruscio *et al.*, 2015). These findings
565 support that avoidance tendency and maladaptive
566 thoughts are key variables in predicting greater levels
567 of psychological distress in the elderly population
568 (Dulin and Passmore, 2010; Petkus *et al.*, 2012).

569 The results also suggest that ruminative thinking
570 about life events is positively related to psychological
571 distress. This relationship is reasonable, especially
572 considering that the rumination tendency acts as a
573 mediator in the relationship between negative life
574 events and psychological distress and that ruminative
575 thoughts related to past life events can produce a
576 persistent negative state of mind (Connolly and
577 Alloy, 2018; Moberly and Watkins, 2008; Ruscio
578 *et al.*, 2015). It should be noted that, even control-
579 ling the impact of key variables on maladjustment to
580 life events (such as experiential avoidance and rumi-
581 nation tendency) (Michl *et al.*, 2013), which evalu-
582 ate more stable and general patterns of maladaptive
583 emotion regulation. The present findings suggest

the additional contribution of this more specific 584
variable in the explanation of psychological distress. 585
Therefore, rumination associated with life events 586
could be part of the specific explanatory mechanism 587
involved in the maladaptive regulation of emotions 588
in elderly people. Additionally, regarding the mag- 589
nitude of the association of the rumination variables, 590
it seems logical that psychological distress is more 591
closely related to the rumination tendency than to 592
the rumination associated with life events, since the 593
former is likely to affect a greater number of aspects 594
of life and is capable of determining the well-being of 595
the older adult. 596

597 Similarly, another variable presented in this
598 study is personal growth associated with life events.
599 Consistent with previous studies in other popula-
600 tions, showing positive relationships between post-
601 traumatic growth and psychological well-being
602 (Calhoun and Tedeschi, 2014) and negative relation-
603 ships with depressive symptomatology (Lee *et al.*,
604 2018), personal growth had a positive impact on
605 distress in this study. Moreover, this variable acted
606 as mediator in the relationship between life events
607 (positive and negative) and psychological distress.
608 In this way, although research is still scarce, our
609 findings coincide with those authors who maintain
610 that personal growth is a basic element in the emotion
611 regulation processes that take place when coping
612 with traumatic life events (Dekel *et al.*, 2012).
613 As for the mechanisms responsible for this relation-
614 ship, it is proposed that personal growth can generate
615 changes (both in oneself and in interpersonal relation-
616 ships) that protect the person from the characteristic
617 feelings of isolation and loneliness (Lee *et al.*, 2018).

618 **The role of physical functioning**

619 It should be highlighted here that the objective of
620 this paper is not to explain physical functioning
621 based on stressors or psychological variables, but
622 rather to generate an explanatory model of psycho-
623 logical distress in order to understand the impact
624 that life events and emotion regulation processes
625 have on distress in the elderly population. In this
626 sense, and taking into account the negative impact
627 that negative life events have shown on the physical
628 function of the older population (Cutrona *et al.*,
629 1986; Krause *et al.*, 2004; Wong and Waite,
630 2016), it has been considered necessary to control
631 this effect in the proposed model; and thus be able
632 to specify the role of emotion regulation processes
633 and life events (controlling the effect of health) on
634 psychological distress. However, in light of the
635 results and although its contribution is modest,
636 physical function also acts as an explanatory variable
637 of the distress levels, as well as a mediator variable
638 of the impact that life events have on distress.

639 These findings are in line with those studies that
640 show the harmful or protective role (depending on
641 the type of event) that life events have on the physical
642 functioning of older people (Krause *et al.*, 2004).

643 **Conclusions, limitations, and future directions**

644 The results of this work underline the relevance of
645 life events and subsequent adaptive or maladaptive
646 emotion regulation processes on the well-being of
647 older adults. Specifically, this work explores differ-
648 ent factors of emotion regulation and dysregulation
649 in the community dwellings of older adults, explain-
650 ing the relationships between external life events and
651 symptoms of depression, anxiety, and psychological
652 well-being. These aspects have rarely been explored
653 in the scientific literature of the elderly population
654 (Dulin and Passmore, 2010). The classic approach
655 to life events has been analyzed from stress models,
656 which investigate the impact of such events on a
657 person's life when they have only recently occurred.
658 However, the regulatory and adaptive processes that
659 are put into operation before the experience of such
660 events have been scarcely addressed in the scientific
661 literature. Furthermore, they are seen even less in
662 the elderly population, a group that is more exposed
663 to the variables (Shrira *et al.*, 2012).

664 One of the main contributions of this paper is
665 presenting an integrative model, with goodness-of-
666 fit indices, which combines the most common life
667 events that occur in the aging process with both the
668 emotion regulation processes (adaptive and maladap-
669 tive) and other more general maladaptive emotion
670 regulation processes, in order to explain the psycho-
671 logical distress' levels. This model explains a high
672 percentage of the variance of this latent variable,
673 formed by the main variables of distress in the older
674 population (depressive symptomatology, anxiety, and
675 reduced psychological well-being). Beyond confirm-
676 ing that the study variables act as significant predic-
677 tors of the older adult's psychological distress, it is
678 important to quantify the contribution made by each
679 variable. Thus, the effect size values suggest a small
680 impact of positive life events and physical function-
681 ing, compared to the medium impact of general and
682 relatively stable emotion regulation processes. This
683 rumination and experiential avoidance tendency, as
684 these findings suggest, could have a detrimental and
685 clinically significant effect on the elderly. Specific
686 emotion regulation processes related to how past
687 life events are evaluated, although of small impact,
688 may be of potential theoretical interest in determining
689 the distress levels, as they make an additional contri-
690 bution to that made by the rest of the variables
691 analyzed. Given that emotion regulation processes,
692 both general and specific, appear in the model as the
693 elements through which life events have their most

detrimental effect on well-being, it can be inferred
that they are fundamental for the psychological well-
being of the elderly.

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697 However, this work presents a series of limita-
698 tions, such as the cross-sectional nature of the study
699 that, as there is no temporal antecedence between
700 the study variables, suggests prudence when assert-
701 ing mediation effects between these variables (Kline,
702 2015). The development of longitudinal studies
703 could rigorously analyze how such mediating effects
704 influence the development of anxious-depressive
705 symptomatology and/or increase levels of psycho-
706 logical well-being throughout a person's old age.
707 Additionally, despite the good fit of the model, we
708 did not test alternative models and there might be
709 other models that also fit properly. Another limita-
710 tion is the convenience sampling, characterized
711 mainly by women (although this is usual in studies
712 of the older population). This may imply a certain
713 bias in the interpretation and generalization of
714 results on the possible impact that emotion regula-
715 tion variables have on psychological distress, since
716 the emotional regulation processes addressed in
717 this work usually present gender differences (with
718 women obtaining higher scores in certain maladap-
719 tive processes). The exclusion of some relevant vari-
720 ables (i.e. social support, enjoyable activities, coping
721 styles, and other emotion regulation variables) in the
722 study of the impact of life events on the older adult's
723 distress creates another limitation. Therefore, the
724 results obtained should be assessed with caution,
725 in the absence of experimental studies that confirm
726 them, and attempting to overcome some of the limita-
727 tions presented.

728 Among future lines, and in relation to the vari-
729 ables that are shown to be fundamental in this work,
730 it could be very useful to develop training programs
731 for older people in which to encourage the use of
732 adaptive emotional processes in the face of vital
733 stressors experienced in old age. In fact, previous
734 work has demonstrated the efficacy of cognitive-
735 behavioral interventions aimed at reducing mal-
736 adaptive emotion processes (Watkins *et al.*, 2011).
737 Likewise, given the characteristics of the evaluated
738 population, in addition to the variables already
739 mentioned, a physical functioning variable has
740 been indicated as a relevant element in the explana-
741 tion of psychological distress, which leads us to
742 suggest its inclusion in future intervention programs
743 for the elderly.

744 On the other hand, another theoretical-practical
745 implication of this study has been to show the
746 importance of both adaptive and maladaptive pro-
747 cesses of emotion regulation in the coping and
748 adaptation to life events. Despite being a scarcely
749 explored variable, the results suggest the clinical
750 relevance of ruminant thinking related exclusively

751 to life events when explaining the psychological
 752 distress of the elderly. In line with the growing trend
 753 in the search for positive functioning variables in
 754 elderly people, the findings suggest paying more
 755 attention to the role of personal growth related to
 756 life events. This was recently added to the revised
 757 models of active aging in the World Health Organi-
 758 zation (WHO, 2015). In them, the need to study and
 759 strengthen positive coping and resilience factors in
 760 the elderly population to guarantee their eudaimonic
 761 well-being is highlighted (Faber, 2015; WHO, 2015).

762 It can be concluded that this work, through the
 763 model it presents, allows us to better understand the
 764 interaction between life events and emotion regula-
 765 tion processes on the psychological well-being of
 766 elderly adults. It is necessary to increase research in
 767 this area as the present work finds evidence suggest-
 768 ing the buffering or detrimental effect that various
 769 emotion regulation processes have on the occur-
 770 rence of life events at this stage of life.

771

772 Conflict of interests

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779 Description of authors' roles

780 All the authors collaborated in the design and imple-
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