

Age as a Risk Factor for Burnout Syndrome in Nursing Professionals: A Meta-Analytic Study

José L. Gómez-Urquiza, Cristina Vargas, Emilia I. De la Fuente, Rafael Fernández-Castillo, Guillermo A. Cañadas-De la Fuente

Correspondence to: Jose L. Gómez-Urquiza
E-mail: jlgurquiza@ugr.es

José L. Gómez-Urquiza
Nursing Lecturer
Department of Nursing (Departamento de Enfermería)
University of Granada (Universidad de Granada)
Campus Universitario de Ceuta
C/Cortadura del Valle s/n, 51001
Ceuta, España

Cristina Vargas
Faculty of Psychology
University of Valencia
Valencia, Spain

Emilia I. De la Fuente
Brain, Mind and Behavior Research
Center (CIMCYC)
University of Granada
Granada, Spain

Rafael Fernández-Castillo
Nursing Lecturer
Department of Nursing
Faculty of Health Sciences
University of Granada
Granada, Spain

Guillermo A. Cañadas-De la Fuente
Nursing Lecturer
Department of Nursing
Faculty of Health Sciences
University of Granada
Granada, Spain

Abstract: Although past research has highlighted the possibility of a direct relationship between the age of nursing professionals and burnout syndrome, results have been far from conclusive. The aim of this study was to conduct a wider analysis of the influence of age on the three dimensions of burnout syndrome (emotional exhaustion, depersonalization, and personal accomplishment) in nurses. We performed a meta-analysis of 51 publications extracted from health sciences and psychology databases that fulfilled the inclusion criteria. There were 47 reports of information on emotional exhaustion in 50 samples, 39 reports on depersonalization for 42 samples, and 31 reports on personal accomplishment in 34 samples. The mean effect sizes indicated that younger age was a significant factor in the emotional exhaustion and depersonalization of nurses, although it was somewhat less influential in the dimension of personal accomplishment. Because of heterogeneity in the effect sizes, moderating variables that might explain the association between age and burnout were also analyzed. Gender, marital status, and study characteristics moderated the relationship between age and burnout and may be crucial for the identification of high-risk groups. More research is needed on other variables for which there were only a small number of studies. Identification of burnout risk factors will facilitate establishment of burnout prevention programs for nurses. © 2016 Wiley Periodicals, Inc.

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Burnout syndrome is a psychological disorder that affects an increasing number of professions, and nurses are among those at highest risk. In efforts to identify nurses at risk for burnout in order to target prevention programs, studies of age as a risk factor have produced conflicting

results. This meta-analysis was focused on determining an overall effect size of the relationship between age and burnout syndrome in nursing professionals and whether there were any moderators that strengthened or weakened a relationship between age and burnout.

Professions at Risk of Burnout

Burnout can be defined as a tridimensional syndrome characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment. Emotional exhaustion refers to the exhaustion of workers' affective and emotional spheres, depersonalization consists of cynical and negative attitudes toward patients, and low personal accomplishment is characterized by workers' negative self-evaluation and the inability to feel fulfilled in their jobs (Gil-Monte & Peiró, 1998). Burnout is generally evaluated by the Maslach Burnout Inventory (MBI) (Maslach & Jackson, 1981), which has long been recognized as the leading measure of burnout. Although other instruments are available (Demerouti, Bakker, Nachreiner, & Ebbinghaus, 2002), the MBI in various versions or adaptations is still the most widely used by researchers and considered the gold standard (De la Fuente et al., 2013, 2015).

Workers in the helping professions (e.g., healthcare workers, policemen, and teachers) are at greater risk of burnout because of their constant and intense interactions with the patients/clients who receive their care (Schaufeli, Leiter, & Maslach, 2009).

The high prevalence of burnout syndrome in certain professions and the problems that it generates for workers and their organizations have caused it to be regarded as an occupational illness. In countries such as Switzerland and the Netherlands, burnout is a formal medical diagnosis like other pathologies (Schaufeli et al., 2009), and in Spain burnout was officially defined as an occupational illness in 2000 by the Spanish Supreme Court (Supreme Court Sentence of 26/10/2000). Burnout is also included in the International Diseases Classification of the World Health Organization, in the category of life-management difficulty (World Health Organization, 2015).

In healthcare professions and particularly nursing, the high prevalence of burnout has been the focus of considerable research. In fact, according to certain studies, nurses are the workers most prone to development of the syndrome (Bacalco-Parrado et al., 2012; Losa Iglesias & Becerro de Bengoa, 2013). Burnout levels of nurses, at least in Spain, could be partly explained by the current economic crisis, which has led to heavier workloads, more demanding performance objectives, and part-time temporary contracts, all accompanied by salary reductions (Calero Romero, 2012). Similar situations are found in other countries, such as China, where too few nurses are hired while the patient census is increasing (Zhang et al., 2014). These high-pressure situations may increase the number of nurses who leave their jobs, as detected in the United States by Buerhaus, Auerbach, and Staiger (2009), who found that 37% of nurses said that they were not working as nurses due to the stress and burnout it produced.

Some of the symptoms found in nurses who suffer from burnout include chronic fatigue, emotional instability, headaches, insomnia, and relationship problems (Embrico,

Papazian, Kentish-Barners, Pochards, & Azoulay, 2007). Burnout not only affects the physical and mental health of nursing professionals but has a negative impact on health-care centers and their patients because it lowers the quality of medical care and health services and decreases nursing staff retention rate (Barford, 2009).

Risk Factors for Burnout

The risk factors of burnout most often studied are related to the workplace environment (Sinclair et al., 2015), but in the last 10 years, there have been an increasing number of studies on the association of burnout with psychological variables (Cañadas-De la Fuente et al., 2015; Hudek-Knezevic, Kalebic Maglica, & Krapic, 2012). Although fewer researchers have focused on burnout's possible association with socio-demographic variables (Purnanova & Muros, 2010), these variables may be potential risk factors on their own or may moderate the association of burnout with other variables (Vargas, Cañadas-De la Fuente, Aguayo, Fernández, & De la Fuente, 2014).

Other than in descriptions of samples, the relationship between age and burnout is generally passed over without any specific mention. When the relationship has been examined, some reports indicated a significant decrease in the scores of the three dimensions of burnout as the subjects' age increased (Akkus, Karacan, Göker, & Aksu, 2010), while other researchers found that the dimensions of emotional exhaustion and depersonalization decreased but personal accomplishment rose (Hochwälder, 2008). Some have reported lower burnout levels in nurses under the age of 30 as compared to those over 30 (Losa Iglesias, De Bengoa Vallejo, & Salvadores Fuentes, 2010), and others found no significant differences for different age ranges (Kiekkas, Spyrtos, Lampa, Aretha, & Sakellarpoulos, 2010). These contradictory results make it difficult for researchers to know whether age is a risk factor for burnout and whether it should be included in a burnout risk profile for nursing professionals. Access to this knowledge would permit them to take into account age when establishing burnout prevention programs.

Similar contradictory results related to occupational variables (Vargas et al., 2014) and other sociodemographic variables, such as gender (Purnanova & Muros, 2010), have been clarified in meta-analytic studies, but there have been no previous meta-analyses of the relation between age and burnout. For this reason, we decided to conduct a meta-analysis in order to systematically assess the impact of these heterogeneous results on age as a risk factor. Our meta-analysis was focused on the effect size of the relationship between age and burnout syndrome in nursing professionals. The general objective was to ascertain whether such an association existed and whether there were any moderating variables that strengthened or weakened it, with the goal of formulating a recommendation for

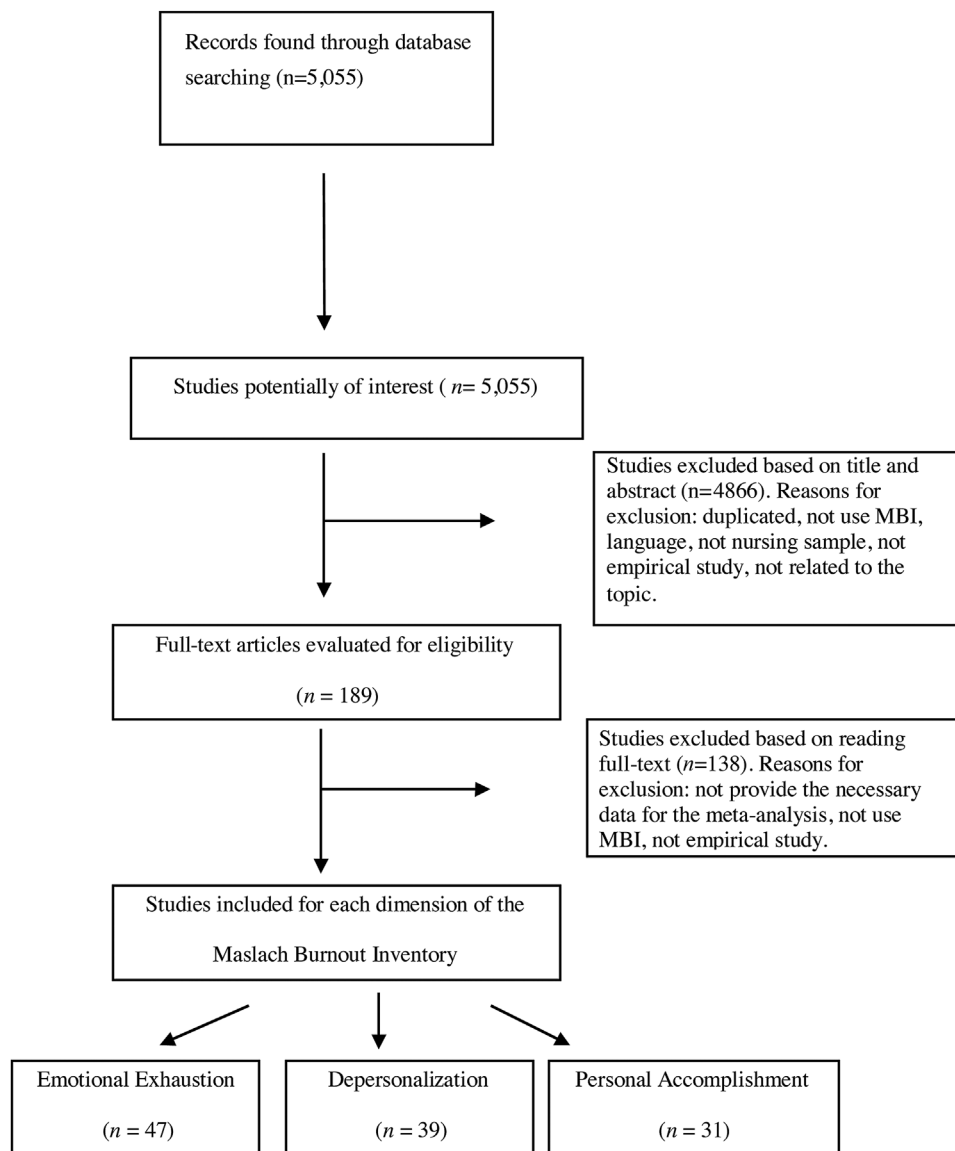


FIGURE 1. Flow chart for selection of studies included in meta-analysis.

incorporating or excluding age as a factor in a burnout risk profile for nurses.

Methods

Bibliographic Search and Inclusion Criteria

The first step in the search process involved searching the following electronic databases: CINAHL, Dialnet, OVID, PubMed, Proquest Platform (ebrary ebooks, Medline, ProQuest Health & Medical Complete, PsycARTICLES, and PsycINFO), Psycodoc, and Scopus. The search equation used without any field restrictions was: ("Maslach Burnout

Inventory" OR "MBI") AND (nurs*). Second, meta-analytic studies, systematic, and narrative reviews of the topic were consulted in Cochrane Library Plus and Google Scholar, although no results were obtained.

To widen the search of grey literature, we then consulted Google Scholar as well as ProQuest Dissertations and Theses. This was complemented by a forward search of the Science Citation Index and Scopus to find reports with citations of the work thus identified. Finally, a backward search was performed in order to revise and retrieve references of the studies selected for the meta-analysis. The literature search based on these parameters was conducted in January 2015.

The following inclusion criteria were used: Empirical studies in which the MBI was used to assess burnout in a nursing sample, and in which the effect size of the relationship between age and one of the MBI dimensions was specified. The following publication languages were included: Spanish, English, French, Italian, or Portuguese. The publication date was not an exclusion criterion.

Initially, 5,055 published reports were potentially of interest. After reading the titles and the abstracts, this number decreased to 189. After reading the complete text of the article, we excluded those reports that did not provide sufficient statistical information to calculate effect size or that did not use the MBI to measure burnout. Also discarded were studies written in Chinese or German or in which the sample included occupations in addition to nurses. Before the final inclusion decision, the methodological quality of the studies was evaluated with the internal validity items (2–6 and 11–18) from the critical appraisal guide for observational studies (Ciapponi, 2010). These items assess aspects of sample selection, definition and measure of study variables, and statistical analyses. No study was excluded due to methodological bias. Two members of the team conducted all the search processes, including the quality assessment, independently, consulting a third member in case of disagreement.

Sample Description

The final sample for the meta-analysis was 51 reports. Of these, 47 reports included information for a total of 50 samples on the dimension of emotional exhaustion, 39 reports included information for 42 samples on depersonalization, and 31 reports included information for 34 samples on personal accomplishment (Fig. 1). The total sample was composed of 23,176 nursing professionals.

Codification of Variables and Effect Sizes

The effect sizes recorded were the Pearson bivariate correlations between each of the burnout dimensions and age. For this and the other variables, a codebook (Cooper, Hedges, & Valentine, 2009), available from the corresponding author on request, was created. Other variables were coded as follows:

Substantive variables. Mean value and standard deviation of age, job seniority, professional experience, job satisfaction and MBI scores were recorded. Gender, marital status, children (percentage of the sample with children), and work shift variables were recorded, respectively, as follows: percentage of females, percentage of the sample living with a partner, percentage of the sample with children, and percentage of the sample on rotating shifts.

Methodological variables. We recorded sample size, Cronbach alpha coefficient for the three MBI dimensions, MBI type (1, *original*; 2, *adaptation*), MBI language (1, *English*; 2, *Spanish*; 3, *other*), response rate

(percentage of completed questionnaires), research design (1, *experimental*; 2, *quasi-experimental*; 3, *ex post facto*; 4, *questionnaire-based or observational*), sampling technique (1, *random*; 2, *convenience*), and number of organizations where data was collected (1, *one organization*; 2, *more than one organization*).

Extrinsic variables. We coded publication type (1, *journal with JCR impact factor*; 2, *journal without JCR impact factor*; 3, *PhD thesis*), continent where the research was carried out (1, *Europe*; 2, *North America*; 3, *Asia*; 4, *South America*) and date of publication (year when the article was published).

To evaluate the reliability of the coding, two independent judges, not directly involved in the research, were contacted. Their intraclass correlation coefficient was calculated to evaluate the convergence in the continuous variables, and a value of .91 (minimum = .81; maximum = 1.00) was obtained. In the categorical variables, Cohen's kappa coefficient was calculated to assess the mean degree of convergence, obtaining a value of .90 (minimum = .73; maximum = 1.00).

Statistical Analysis

To avoid problems of statistical dependence, a separate meta-analysis was performed for the association of age with each of the MBI dimensions. To improve the normality of the distributions in the meta-analytical calculations and to stabilize the variances, Pearson's correlation was converted to Fisher's *Z*. After the analyses were performed, the conversion of Fisher's *Z* to Pearson's *r* provided the mean effect size along with the 95% confidence intervals (*CI*; Cooper et al., 2009). The mean effect size and 95% *CI* of each meta-analysis were calculated on the assumption of a random effects model because this was regarded as more realistic, and the number of studies was sufficiently large (Cooper et al., 2009).

To assess the homogeneity of the mean effect, the *Q* test for heterogeneity and the I^2 index were used. When the mean effect was heterogeneous, an analysis of the potential moderating variables was performed. Simple meta-regressions were used to analyze the influence of the quantitative moderating variables. The meta-regressions were done with the method of moments model and with a fixed effects model for the variables with few studies (Borenstein, Hedges, Higgins, & Rothstein, 2005). For categorical variables, ANOVA was used to compare groups (Cooper & Hedges, 1994). Statistically significant moderating variables supported by a large number of studies were included in the multiple meta-regressions.

A sensitivity analysis was also performed to ascertain whether any of the studies in the meta-analysis produced variation in the mean estimate of the effect obtained. Egger's linear regression test was applied to calculate possible publication bias (Egger, Smith, Schneider, & Minder, 1997). The software Comprehensive Meta-analysis 2.0

Table 1. Effect Sizes of Relationships Between Age and Burnout Dimensions in Studies Included in Meta-Analysis

Author (Year)	Sample Size	Quality Rating (Maximum of 13)	Effect Size of Relationship Between Age and Burnout Dimensions		
			Emotional Exhaustion	Depersonalization	Reduced Personal Accomplishment
Akhtar, Lee, and Lai (2003)	2,267	13	-.222	-.25	.17
Alacacioglu et al. (2009)	56	12	.092	.217	.012
Albar Marín and García Ramírez (2005)	210	13	-.19	ND	ND
Bakir et al. (2010)	353	12	-.009	-.057	-.049
Beaver, Sharp, and Cotsonis (1986)	1,332	13	ND	-.23	ND
Bekker, Croon, and Bressers (2005)	394	12	.12	ND	ND
Cañadas-De la Fuente et al. (2014)	164	12	.149	.076	-.044
Cash (1988)	99	13	-.01	.01	.12
Chen and McMurray (2001)	68	12	-.31	-.39	ND
Curci (1996)	182	13	-.11	-.21	.16
De Rijk, Le Blanc, Schaufeli, and de Jonge (1998)	277	12	.09	.07	ND
Diefenbeck (2005)	233	13	-.12	ND	ND
Edwards et al. (2006)	260	13	ND	.07	ND
Fusco (1994)	101	13	-.09	-.052	.104
Gueritault-Chalvin, Kalichman, Demi, and Peterson (2000)	445	12	-.15	-.185	-.05
Hale (1993)	50	13	-.13	-.2	.32
Hayter (1999)	30	12	.035	-.23	-.01
Hayter (2000)	47	13	.041	.055	.077
Hochwälder (2007)	838	12	-.04	-.18	-.03
Hochwälder (2008)	838	12	-.04	-.11	-.06
Hochwälder (2009)	659	12	-.01	-.19	.11
Hunnibell et al. (2008)	563	11	-.15	-.18	.2
Khani et al. (2008)	120	12	ND	-.24	ND
Kilfedder, Power, and Wells (2001)	510	12	-.1	-.2	-.03
Kowalski et al. (2010)	807	12	.01	ND	ND
Lee et al. (2003)	178	12	-.16	-.25	.27
Lin et al. (2009)	128	12	.205	-.118	.237
Mahan (1999)	47	12	ND	-.41	ND
Martínez-López and López-Solache (2005)	551	11	-.173	-.12	-.169
McCain (1994)	161	12	-.566	-.488	.405
Meeusen, Van Dam, Brown-Mahoney, Van Zundert, and Knape (2010)	882	12	.1	.16	-.06
Melchior et al. (1997)	361	12	-.03	-.1	.15
Patrick and Lavery (2007)	574	11	-.08	-.23	.04
Pisanti et al. (2011)	609	12	-.05	-.18	.07
Pisanti et al. (2011)	884	12	-.08	-.09	-.1
Pisanti (2007)	271	12	-.01	-.13	.17
Pomaki, Karoly, and Maes (2009)	222	12	-.07	ND	ND
Pons (1995)	84	13	.078	.145	-.019
Proost, De Witte, De Witte, and Evers (2004)	2,075	12	.1	.05	-.1
Schmidt and Diestel (2011)	379	12	-.02	ND	ND
Schulz et al. (2009)	389	12	.17	-.106	ND
Shockley (1994)	84	12	-.253	ND	ND
Sims (2000)	91	12	-.29	-.27	.00
Tourigny, Baba, and Wang (2010)	550	11	.11	-.17	-.21
Tourigny et al. (2010)	239	11	-.08	-.12	-.25
Tselebis, Moulou, and Ilias (2001)	79	12	-.2	-.07	-.01
Tummers, Landeweerd, and Van Merode (2002)	1,204	12	.02	ND	ND
Tummers, Landerweed, et al. (2006)	379	12	-.02	ND	ND
Tummers, Van Merode, et al. (2006)	184	12	.08	ND	ND
Tummers, Van Merode, et al. (2006)	927	12	.01	ND	ND
Van Servellen and Lake (1993)	233	12	-.01	ND	ND
Yousefy and Ghassemi (2006)	45	12	.3	ND	ND
Zellars, Perrewé, and Hochwarter (2000)	175	11	-.18	-.24	-.14
Zellars, Hochwarter, and Perrewé (2004)	288	11	-.02	-.17	-.11
Total effect size	-	-	-.046*	-.130*	.029

Note. ND, No data.

* $p < .05$

Table 2. Significant Moderators (Continuous Variables) of Effect of Age on Burnout Dimensions (Weighted Simple Regression)

Burnout Dimension	Moderator	<i>k</i>	<i>b</i>	Q_R	Q_E	F^2
Emotional exhaustion	Gender	42	-.00350	5.52*	34.82	.136
	Marital status	20	-.00509	5.38*	18.57	.224
	<i>SD</i> of professional experience	22	-.02890	5.32*	17.80	.230
	Mean personal accomplishment	33	-.00366	5.75*	41.75	.121
	Publication year	50	.00970	8.73**	51.28	.145
Depersonalization	Gender	36	-.00365	5.07*	36.20	.122
	<i>SD</i> of emotional exhaustion	33	-.01054	5.80*	36.21	.138
	Response rate	33	.00288	4.38*	34.87	.111
Personal accomplishment	Mean job seniority	4	.02365	5.67*	1.73	.766
	Mean emotional exhaustion	28	.01120	29.94***	27.36	.522
	<i>SD</i> of emotional exhaustion	27	.02094	20.41***	26.86	.431
	Mean depersonalization	27	.03365	25.28***	28.43	.470
	<i>SD</i> of depersonalization	27	.04561	24.60***	29.08	.458
	Publication year	34	-.01022	5.87*	30.56	.161

Note. *k*, number of studies; *b*, non-normalized regression coefficient; Q_R , inter-group effects statistic; Q_E , statistic of the homogeneity of the effect size within each group; F^2 , proportion of the variance explained by the moderating variable; *SD*, standard deviation.

* $p < .05$

** $p < .01$

*** $p < .001$

Table 3. Effect Sizes of Significant Moderators (Categorical Variables) of Effect of Age on Burnout Dimensions (Weighted ANOVA)

Burnout Dimension	Moderator	Categories	<i>k</i>	<i>r</i>	95% <i>CI</i>	ANOVA	F^2
Emotional exhaustion	MBI	Original	25	-.118	[-.168, -.067]	$Q_B(1) = 16.675^{***}$	.069
		Adaptation	25	.018	[-.023, .058]	$Q_W(48) = 223.913^{***}$	
	MBI language	English	25	-.118	[-.168, -.067]	$Q_B(2) = 22.030^{***}$	.098
		Spanish	3	-.079	[-.264, .111]	$Q_W(47) = 202.572^{***}$	
	Continent	Others	22	.031	[-.005, .068]		
		Europe	25	.005	[-.028, .038]	$Q_B(2) = 14.411^{**}$	.060
Depersonalization	North America	Asia	15	-.151	[-.222, -.078]	$Q_W(47) = 223.653^{***}$	
		Asia	10	-.029	[-.139, .081]		
	MBI type	Original	26	-.188	[-.229, -.146]	$Q_B(1) = 13.748^{***}$	.077
		Adaptation	16	-.047	[-.109, .016]	$Q_W(40) = 178.279^{***}$	
	MBI language	English	26	-.188	[-.229, -.146]	$Q_B(2) = 13.119^{***}$	.068
		Spanish	3	.025	[-.151, .199]	$Q_W(39) = 178.271^{***}$	
	Others	Others	13	-.062	[-.131, .008]		
		Europe	17	-.061	[-.126, .003]	$Q_B(2) = 9.247^*$	.043
	North America	North America	15	-.188	[-.250, -.125]	$Q_W(39) = 204.286^{***}$	
		Asia	10	-.177	[-.240, -.112]		
Personal accomplishment	MBI type	Original	20	.075	[.010, .138]	$Q_B(1) = 5.494^*$	.024
		Adaptation	14	-.035	[-.100, .030]	$Q_W(32) = 216.612^{***}$	
	MBI language	English	20	.075	[.010, .138]	$Q_B(2) = 9.458^{**}$	.042
		Spanish	2	-.124	[-.239, -.005]	$Q_W(31) = 212.055^{***}$	
	Others	Others	12	-.021	[-.094, .051]		
		JCR	12	-.040	[-.089, .010]	$Q_B(2) = 56.819^{***}$	.244
	Non-JCR	Non-JCR	14	.020	[-.064, .104]	$Q_W(30) = 175.159^{***}$	
		Thesis	8	.142	[.005, .274]		
	Sampling	Random	13	.088	[.023, .152]	$Q_B(1) = 4.981^*$	.025
		Convenience	21	-.011	[-.069, .047]	$Q_W(32) = 191.644^{***}$	

Note. *CI*, confidence interval; *k*, number of studies; *r*, mean effect size; Q_B , between-categories *Q* statistic; Q_W , within-categories *Q* statistic; F^2 , proportion of the variance explained by the moderating variable; JCR, journal ranked in JCR.

* $p < .05$

** $p < .01$

*** $p < .001$

(Borenstein et al., 2005) and the metafor package of R 2.15.2 (Viechtbauer, 2010) were used to perform the statistical analyses.

Results

Characteristics of Studies in Sample

The 51 studies included in this meta-analysis were all observational; 48% were done in Europe, 31% in America, and 21% in Asia. Of the studies, 46% were published in journals included in the Journal Citation Reports impact factor ranking, 38% were not included, and 15% were doctoral theses. The sampling was convenience in 65% of the cases and random in 35%. The most frequent years of publication were 2006, 2009, and 2010, representing 10% each.

Effect Sizes of Age on Burnout

The effect sizes of age on burnout were small. The mean correlations between age and the three burnout dimensions were the following: emotional exhaustion, $r = -.046$ (95% *CI* $-.084, -.008$; $k = 50$); depersonalization, $r = -.130$ (95% *CI* $-.174, -.086$; $k = 42$); and reduced personal accomplishment, $r = .029$ (95% *CI* $-.023, .080$; $k = 34$). The mean correlations between age and emotional exhaustion ($p < .05$) and depersonalization ($p < .001$) were statistically significant, though there was no significant mean correlation between age and personal accomplishment ($p = .280$). Characteristics and effect sizes of each study are shown in Table 1.

The sensitivity analyses did not show any change in the meaning and significance of the mean effect in the burnout when each of the studies in the analysis was eliminated. Egger's linear regression did not show publication bias for any of the three dimensions: emotional exhaustion ($p = .71$), depersonalization ($p = .58$) and personal accomplishment ($p = .63$).

The results of the heterogeneity analysis showed variability in each of the estimates of the mean effect size: Emotional exhaustion, $Q(49) = 330.00$, $p < .001$; depersonalization, $Q(41) = 297.03$, $p < .001$; and reduced personal accomplishment, $Q(33) = 299.91$, $p < .001$. The level of heterogeneity was high in consonance with the I^2 index, which showed values of 85.15% for emotional exhaustion, 86.19% for depersonalization, and 88.99% for personal accomplishment. These results indicated the need to evaluate moderating variables that may explain the variability.

Moderators of Effect of Age on Burnout

In the correlation between age and emotional exhaustion, the significant substantive moderators (Tables 2 and 3) were gender ($p < .05$), marital status ($p < .05$), standard deviation of professional experience ($p < .05$), and mean score in personal accomplishment ($p < .05$). Significant

methodological moderators were MBI type ($p < .001$) and MBI language ($p < .001$). Significant extrinsic moderators were the continent where the study was carried out and the publication date ($p < .01$).

Moderators of the correlation between age and depersonalization (Tables 2 and 3) were gender ($p < .05$) and standard deviation of emotional exhaustion ($p < .05$). Significant methodological moderators were MBI type ($p < .001$), MBI language ($p < .001$), and response rate ($p < .05$). The continent where the study was performed was the only significant extrinsic moderator ($p < .05$).

Moderators of the correlation between age and personal accomplishment (Tables 2 and 3) were the mean value of job seniority ($p < .05$), mean score on emotional exhaustion ($p < .001$), standard deviation of emotional exhaustion ($p < .001$), mean score on depersonalization ($p < .001$) and standard deviation of depersonalization ($p < .001$). Statistically significant methodological moderators were MBI type ($p < .05$), MBI language ($p < .01$), and sampling ($p < .05$). Significant extrinsic moderators were publication type ($p < .001$) and date of publication ($p < .05$). Mean job seniority, with four studies, had a small number of studies for analysis.

A regression model was obtained to predict the variability of effect sizes in the association between age and emotional exhaustion ($k = 30$). The predictors included as moderators in the model were gender, mean score of personal accomplishment, and publication date. The model was not statistically significant ($Q_M[3] = 6.54$, $p > .05$) but explained 32% of the total variance.

In regard to the correlation between age and depersonalization, a predictive model that included gender, type of MBI and continent of study as moderators ($k = 36$) was statistically significant ($Q_M[4] = 19.29$, $p < .001$), explaining 57% of the total variance.

The predictive model for the association between age and reduced personal accomplishment ($k = 27$) included as moderators the mean emotional exhaustion scores and mean depersonalization scores. This model was significant ($Q_M[2] = 28.45$, $p < .001$), explaining 61% of the total variance.

Discussion

The objective of this research was to perform a meta-analysis of the possible correlation between age and each of the burnout dimensions. The results of our study indicated that there was a significant inverse association between age and the burnout dimensions of emotional exhaustion and depersonalization. This led us to conclude that older nurses showed lower levels of emotional exhaustion and depersonalization than younger nurses. However, the mean effect size was small, partly because of the wash-out that occurred when positive and negative association values were averaged. Reduced personal accomplishment had no significant association with age

(Hochwalder, 2008). Variables were identified that moderated and strengthened the association of age with these dimensions. However, the number of studies available for some variables, which was small in some cases, should be taken into account.

Moderators of Effect of Age on Emotional Exhaustion

In regard to the relation between age and emotional exhaustion, the significant substantive moderators were gender, marital status, variability in professional experience, and mean personal accomplishment. When a higher percentage of women were present in the samples, the correlation between age and emotional exhaustion was weaker, suggesting that for women, this association is almost non-existent (Alacacioglu, Yavuzsen, Dirioz, Oztop, & Yilmaz, 2009; Hochwalder, 2009; Schmidt & Diestel, 2011). The same was true for marital status. When the percentage of married subjects was higher, the correlation between age and emotional exhaustion was also weaker (Kiekkas et al., 2010). In other words, married women with high personal accomplishment scores may be better protected against loss of energy and enthusiasm in their profession.

The methodological variables that significantly moderated this correlation were MBI type and MBI language. When the MBI was the original English version of the questionnaire, the association between age and emotional exhaustion was negative (Diefenbeck, 2005; Hunnibell, Reed, Quinn-Griffin, & Fitzpatrick, 2008), whereas when the questionnaire was an adapted version in another language, the association was positive (Lin, St John, & McVeigh, 2009). However, such differences may stem from incongruities in the translation, validation, and adaptation of the original questionnaires, because language reflects the geographic locations. The influence of the MBI type and its adaptations in the variability of burnout have been also identified in other meta-analyses and systematic reviews on nursing burnout (Albendın et al., 2016; Vargas et al., 2014).

Extrinsic variables that significantly moderated the relation between age and emotional exhaustion were publication date and continent where the study was carried out. There were positive associations between age and emotional exhaustion for nursing professionals working in Europe, and negative associations for those working in countries on other continents (Patrick & Lavery, 2007). It would thus seem that European nurses are less vulnerable to emotional exhaustion than nurses in North America, Asia, and South America. The influence of the continent and the countries on the variability of burnout levels has been reported by other authors as a key factor in nursing burnout research (Gomez-Urquiza, Aneas-Lopez, et al., 2016; Gomez-Urquiza, Monsalve-Reyes, et al., 2016).

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Moderators of Effect of Age on Depersonalization

For the effect of age on depersonalization in nurses, the substantive moderators were gender and standard deviation of emotional exhaustion. Once more, when there were higher percentages of women in the samples, there was a weaker association between age and depersonalization (Pisanti, Van Der Doef, Maes, Lazzari, & Bertini, 2011). MBI type and language were methodological moderators (Edwards et al., 2006; Pisanti et al., 2011). The Spanish version of the MBI showed a positive association between age and depersonalization, whereas questionnaires in English and other languages showed a negative association.

The response rate of the studies was a significant methodological moderator. When the response rate was higher, the correlation between the variables was greater (Alacacioglu et al., 2009). The continent where the study was carried out was a significant extrinsic moderator. The negative association between age and depersonalization was strongest in America and Asia (Khani, Jaafarpour, & Jamshidbeigi, 2008; Patrick & Lavery, 2007). This suggests that younger nurses working on these continents are more protected against the development of a cynical attitude toward their patients than are nurses working in Europe.

Moderators of Effect of Age on Reduced Personal Accomplishment

Significant substantive moderators of the correlation between age and personal accomplishment were the averages and variability of the scores for emotional exhaustion and depersonalization, as well as the average job seniority. In the case of professionals with high scores in the other burnout dimensions and with a greater dispersion of these values, the association between age and personal accomplishment was more pronounced (Lee, Song, Cho, Lee, & Daly, 2003; Pisanti, 2007). The same also occurred when the subjects had more years of job seniority (Melchior et al., 1997).

Significant methodological moderators that strengthened the relationship between age and reduced personal accomplishment were MBI type, MBI language and sampling. The association was greater in those studies that used the original version of the MBI (Pisanti et al., 2011; Hunnibell et al., 2008) and the English or Spanish version of the questionnaire. This underlines the importance of using good adaptations of the questionnaire. When the sampling approach was random, the relationship between age and personal accomplishment was stronger (Pisanti, 2007).

Extrinsic moderators of the impact of age on reduced personal accomplishment were publication type and publication date. The association was weaker in research articles and stronger in PhD theses (Bakir, Ozer, Ozcan,

Cetin, & Fedai, 2010). The more recent the study, the smaller the correlation between age and reduced personal accomplishment. This could be due to recent worsening of the work conditions for nursing professionals.

The meta-analysis had several limitations. Some analyses of moderating variables (e.g., job seniority) were based on a small number of studies, which may have led to overestimated results in some analyses (e.g., simple regression analyses). Thus, moderating variables identified here using a small number of studies should be interpreted with caution. Furthermore, the evidence level of the studies was low, due to their observational design, although it was appropriate for this research question and all met internal validity criteria (Ciapponi, 2010).

In conclusion, although individual studies of the relationship between age and burnout have been contradictory, in this meta-analysis of 51 studies, emotional exhaustion and depersonalization were higher in younger nurses. It also appeared that unmarried male nurses were most vulnerable to emotional exhaustion. Finally, nurses with high levels of emotional exhaustion and depersonalization could be at greatest risk of a low level of personal accomplishment. Knowing the relationship between age and burnout can help to direct preventive burnout interventions toward younger nurses. The role of other sociodemographic or psychological factors in burnout should be investigated with meta-analyses to further elaborate a burnout risk profile for nurses.

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