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How to survive the doctorate? A meta-analysis of succes in PhD Candidates

¿Cómo sobrevivir al doctorado? Un meta-análisis del éxito en doctorandos

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ABSTRACT

Doctorates are the key for new researchers to begin their scientific activity. This process has traditionally implied a profound loneliness and the development of issues that affect the health of PhD students. The objective of the research was to conduct a meta-analysis to examine the influence of certain sociodemographic and personal variables on doctoral dropout. Following a review of existing literature and based on inclusion and exclusion criteria, the total sample consisted of 9 articles, which included a total of 53 samples and 32760 doctoral students with an average age of 29.80 years. The main results indicate that the permanence in the doctoral program depends on gender, age, and personal variables, with social support (family support, institutional support, and self-esteem) explaining 11% of the persistence in the doctoral program, followed by self-esteem. Burnout, on the other hand, explains a very small percentage of success ($\text{Tau}^2 = 0.40$; $I^2 = 99.48$; $R^2 = .03$; $p = .001$). The model that best explains permanence in doctorate studies is social support.

Doctorate students demand support from their peers, families and institutions to which they are giving their work, so our results can be explained by the relevant role of social support as a mediator in the consequences of stress. In view of the obtained results, it is concluded that the existence of a series of factors such as age, gender, support from the closest environment and a democratic and ethical leadership style by the institutions, along with the social actions of communicating and generating synergies, favours success in the attainment of a doctorate degree. To sum up, the results of this study suggest the convenience of carrying out prosocial actions aimed at finishing the PhD stage successfully.

Keywords: burnout, doctoral program, doctoral students, social support groups, success, universities

RESUMEN

El doctorado es la llave para que los nuevos investigadores inicien su actividad científica. Este proceso ha implicado tradicionalmente una profunda soledad y el desarrollo de problemas que afectan a la salud de los doctorandos. El objetivo de la investigación fue realizar un meta-análisis para comprobar la influencia de determinadas variables sociodemográficas y personales en el abandono de estudios de doctorado. Tras una revisión de la literatura existente y de acuerdo con los criterios de inclusión y exclusión, la muestra total fue de 9 artículos, que contenían un total de 53 muestras y 32760 estudiantes de doctorado con una edad media de 29.80 años. Los principales resultados muestran que la permanencia en el programa de doctorado depende del género, la edad y de variables personales, siendo el apoyo social (apoyo familiar, apoyo institucional y autoestima) el que explica el 11% de la permanencia en el programa de doctorado, seguido de la autoestima, mientras que el *burnout* explica un porcentaje muy bajo del éxito ($\text{Tau}^2 = 0.40$; $I^2 = 99.48$; $R^2 = .03$; $p = .001$). El modelo que mejor explica la permanencia en el doctorado parte del apoyo social. De esta forma, los estudiantes de doctorado demandan el apoyo de sus iguales, familia e institución, pudiendo ser nuestros resultados explicados por el rol tan importante que tiene el apoyo social como mediador de las consecuencias del estrés. Del mismo modo, el papel de la familia y el entorno más cercano no son los únicos elementos relevantes; las universidades, como organizaciones, también pueden favorecer un entorno adecuado, agradable y motivador a través de estilos de liderazgo democráticos y al promover actividades sociales que permitan a los estudiantes de doctorado establecer relaciones socioafectivas que les proporcionen bienestar emocional, una red de aprendizaje y sinergias.

Palabras clave: burnout, doctorado, estudiantes de doctorado, grupos de apoyo social, éxito, universidades

INTRODUCTION

In the university scope, the research and teaching career can only be accessed by attaining the title of Doctor. Despite being considered the last step in the educational stage, the doctorate is a job; given the tasks to be performed, the work of a PhD student can be understood as a service profession in three scopes: teacher, student and researcher (Sorrel et al. 2020). Firstly, PhD students take on a teaching role by sharing their knowledge and expertise with other students. This aspect of doctoral work entails the responsibility of transmitting knowledge and guiding others in their learning process. Secondly, PhD students continue to be learners throughout their doctoral program. They participate in courses, workshops, and conferences to expand their knowledge in their specific field of study. Additionally, they must stay updated on the latest advancements in their research area and constantly update their skills and competencies. Lastly, PhD students are researchers in their own field of study. They dedicate a significant amount of time and effort to original research, contributing to the existing knowledge in their field. Their research work is crucial for advancing the understanding and development of new ideas, theories, and practices in their discipline. In addition, getting a Phd is a process that is associated with high pressure, levels of stress and loneliness (Mattijssen et al., 2020). For that reason, success in the doctorate depends on different variables.

Firstly, regarding the socio-demographic variables, previous studies such as those of Castello et al. (2017) and Sverdlik et al. (2018) show that age and gender affect the success and well-being of PhD students (Schmidt & Hansson, 2018). In this way, not only inter- and intra-personal factors or personal goals (Devos et al., 2017; Sverdlik et al., 2018) affect this process, but gender and age also play a relevant role in it (Devos et al., 2017; Ivankova & Stick, 2007; Leonard et al., 2005; O'Meara et al., 2013; Sverdlik et al., 2018). Regarding gender, it has been found that women present greater emotional exhaustion and intentions to drop out of the academic career (Hunter & Devine, 2016). Moreover, it is important to highlight that the academic career is perceived as hierarchical, making it difficult for women to access them (Eslen-Ziya & Murat, 2022).

Age, on its part, is a significant variable in terms of doctorate dropout, in a way that, the greater the age of the PhD student and the lower the social support, the greater the probability of dropping out of the doctorate programme (González-Betancor & Dorta-González, 2020; Hunter & Devine, 2016).

Another variable that impacts the completion or abandonment of the doctorate programme is stress, specifically burnout. This term refers to a chronic response to workplace stress, which leads to a physical, mentally and emotional state of exhaustion (Maresca et al., 2022). In this sense, it has been demonstrated that PhD students with a work overload derived from the prolonged exposure to stressful

factors can develop other types of disorders, such as depression or anxiety (Kusurkar et al., 2021). The prevalence of students with burnout who will develop other mental diseases is very alarming, posing, in this case, one of the most important variables that influence the abandonment of the doctorate programme (Sorrel et al., 2020). Some variables related to burnout in doctorate students are: studying the PhD in one's home city, having a pre-doctoral contract whose aim is the realisation of the doctoral thesis, and having current or past psychological treatments for disorders such as anxiety or depression (Sorrel et al., 2020).

Moreover, personal variables such as resilience and emotional intelligence are usually considered personal factors that influence the way in which stress and burnout are managed (Blanco-Donoso et al., 2015; García-Izquierdo et al., 2018). In this regard, there are specific populations where it has been demonstrated that resilience could reduce burnout syndrome (Healy et al., 2022; Montgomery & Patrician, 2022). As for emotional intelligence, it seems to be mediating career flexibility, coping attitudes as well as self-control, all of them related to burnout (Ahmed et al., 2022; Jahanzeb et al., 2023).

Lastly, social support has been one of the most studied variables in its association with stress. In the academic scope, it has been demonstrated that, when support comes from the family, it is related to greater levels of academic success than when it comes from the thesis director (Song et al., 2015). In this sense, anyone who intends to attain a PhD, with the aim of culminating the educational stage, requires support, aspirations, capacities and skills for research and teaching (Kim et al., 2018). In this way, it has been identified that the lack of perceived social support is related to a lower well-being in the doctorate student and to a greater probability of developing mental disorders (Levecque et al., 2017; Sverdlik et al., 2018). Thus, social support is demanded by PhD students as an important need; they need to feel supported and have someone to talk to (Lech et al., 2018). Moreover, social support is strongly and positively related to self-esteem (Li et al., 2018) and both factors are related to academic success, with a greater probability of adapting to the chosen career when self-esteem and perceived social support are higher (Ataç et al., 2018).

In the light of the above, some authors have proposed some strategies to prevent and mitigate the effect of burnout. As an example, institutional measures should prioritise the establishment of more conducive work environments that mitigate factors leading to burnout and assist students in managing the interplay between their personal and academic lives, which can contribute to feelings of exhaustion (McAlpine et al., 2020). Finally, it is also important to promote team meetings so this measure could increase the perception of social support among peers and supervisors (Gorbenko et al., 2019).

For the above reasons, the main aim of this study was to perform a review of the scientific evidence, through a meta-analysis, to verify which variables are more strongly related to the rate of dropout from PhD studies. In that sense, variables included in this study were socio-demographic variables (age, gender and geographical area) and personal variables (social support, personality factors and burnout).

METHOD

The research record complied with the principles established by Cochrane in Higgins and Green (2011) and PRISMA (2020). Similarly, the inclusion criteria and exclusion criteria responded to the parameters established by Botella and Sánchez (2015) and Moreau and Gamble (2020) (Table 1):

Table 1
Inclusion and exclusion criteria

Inclusion criteria
Sample: doctorate students, with or without contracts that bind them to a university or research centre (Izquierdo-Martínez, 2007).
Research methodology: experimental, clinical, correlational and quantitative (Frieze & Frankenbach, 2020).
Publication date: 2016 - 2021 (Bashir, et al., 2018). The purpose of this time frame is to carry out an updated study.
Methodological rigour: studies with recognised prestige, published in Q1 indexed journals (Scimago Journal & Country Rank).
Measurement instruments: psychometric tests evaluated in academic publications to measure the psychological variables (Hunter & Schmidt, 2004; Frieze & Frankenbach, 2020).
Exclusion criteria
Adult population with previous disorders or pathologies. However, we included those studies in which there were control groups without pathologies, i.e., normally developing populations.
Statistical and methodological rigour: the existence of ambiguous data, the absence of data treatment, or evaluations that did not comply with the principles of psychometry, as well as measurement errors, attending to the guidelines established by Hunter and Schmidt (2004) and Frieze and Frankenbach (2020).

The search strategy complied with the criteria established by Botella and Gambara (2002), Botella and Sánchez (2015) and PRISMA (2020). The search was conducted in the following databases: WOS, PsycInfo and Science Direct, during March 2021. It is important to clarify the accessibility criterion. This decision responds to the need for transparency and reproducibility of the research, detailed by Lopez-Nicolas et al. (2022). Also, this is a recommendation of the Open Science Collaboration (2015). The results of the Boolean action are graphically represented in a flowchart (Figure 1) and Boolean action can be consulted in Table 2.

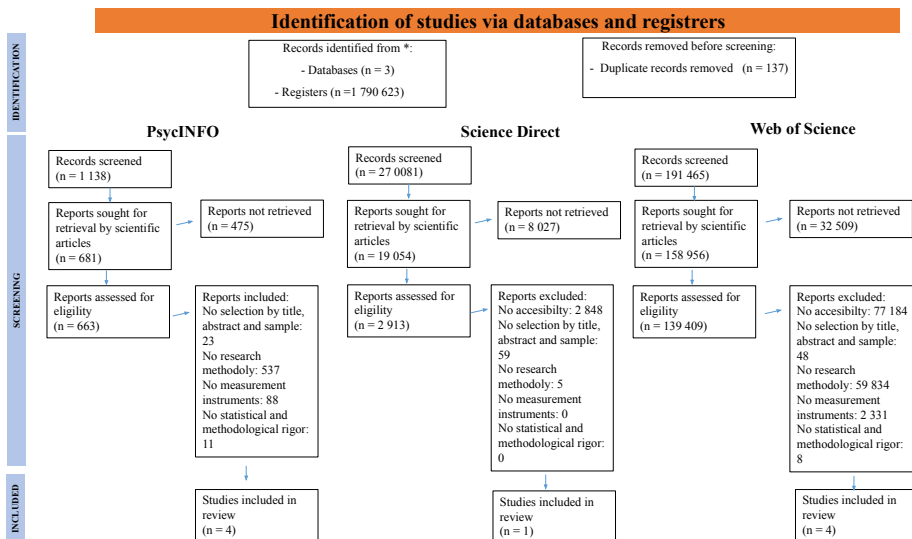
Table 2

The Boolean action

Boolean action
[doctoral student OR PhD student OR PhD candidate] AND [burnout OR stress OR occupational stress] AND [emotional affect OR emotion regulation, mood regulation] AND [mental health OR anxiety OR depression OR sleep problem]
Filters
Time: 2016-2021
Document type: scientific article
Accessibility: access to full text

Figure 1

Flowchart of the search strategy



The study selection was carried out according to the eligibility criteria established by Cochrane in Higgins and Green (2011) and PRISMA (2020). Thus, the initial sample consisted of $n= 1790623$ studies, of which 137 were duplicates. To manage this data, the results from each database were downloaded in csv format and unified, specifying the database to which they belonged, the title, the journal, and the abstract. In addition, it is necessary to mark by means of filters those sources that are scientific, such as scientific journals, omitting other sources such as newspapers. Thus, firstly, it was necessary to review systematically and manually each of the studies, paying attention to the information presented in the abstract and in the title. Inclusion and exclusion criteria were then applied, in the flowchart (see Figure 1). During this screening phase, most of the results were omitted for not responding to the study object in a clear or precise manner. In other words, although they talked about the doctorate, they did not offer information on how this process was carried out, nor what variables were relevant. In this sense, many studies spoke of the importance of the doctorate as a generator of science and innovation. The criterion of statistical and methodological rigour led to the rejection of a considerable part of the sample, since, in most of them, the statistical data did not provide a coherent response to the evaluation manuals employed. In addition, much of the research was carried out using qualitative methodology, especially semi-structured interviews, making it impossible to extract statistical data. Moreover, there were no extreme data or data of higher or lower limits that would not correspond to a normal distribution. Finally, it is noteworthy that many studies could not be analysed because they were not open access. This is a difficulty, since for the internal reliability of the systematic review process, it is necessary for any researcher to be able to replicate this process.

The execution of the conversions of statistical values to Fisher's Z scores was operationalised using CMA software. This decision corresponds to the criteria established by Martin-Andrés and Luna del Castillo (2004) on the importance of selecting a unit of measurement that reduces statistical distortion. The CMA statistical software was used to graphically represent the data through the figures of Forest Plot and Funnel Plot, to calculate the absence of publication bias through Egger's test and to carry out the statistical analyses of heterogeneity, model comparison and meta-regression on the moderating variables. Regarding the latter, we analysed gender (men and women), age, geographic area, and personal variables (social support, personality variables and burnout).

RESULTS

Socio-demographic results of the sample

The sample of our study was constituted by 9 papers, with a total of $K=53$ samples and a total of 32670 doctorate students (Table 3). The mean age of the participants is 29.80 years. The predominating nationality is European (50%), followed by the American nationality (20%). There was no coincidence of countries, except for the USA, where two of the analysed studies were conducted. The rest of the countries are: Sweden, Nigeria, France, Denmark, Netherlands, China and Spain, which shows the diversity of countries in the present study. Lastly, the largest sample was that of Hermann and Wichmann (2017), with 2244, whereas the smallest sample corresponds to Hunter and Devine (2016), with 186 students. It is important to mention that the sample size, $K=53$, exceeds the minimum value established to prevent the distortion of the upper limit of confidence (Bonnet & Price, 2014).

Table 3
Socio-demographic information

Authors	Sample	N samples*	Age	Geographical area	Country	Distribution of participants
Corner et al., (2017)	248	20	No report	Europe	Sweden	PhD Students from three universities representing social sciences, arts and humanities, and natural sciences
Haag et al., (2018)	1923	4	28.04	Europe	France	PhD Students
Hermann and Wichmann (2017)	2244	6	31.8	Europe	Denmark	PhD Students

Authors	Sample	N samples*	Age	Geographical area	Country	Distribution of participants
Hunter & Devine, (2016)	186	6	32.8	International	North America, UK/ Europe, NZ/ Australia/ Africa	PhD Students from nine countries: Canada (63.5%), United States (28.2%), United Kingdom (4.9%), Australia / New Zealand (2.4%), Norway (2.4%), France (0.5%), and South Africa (0.5%).
Kusurkar et al., (2020)	464	1	29.5	Europe	Holland	PhD Students in Medicine
Liu et al., (2019)	325	3	31.11	Asia	China	PhD Students in Medicine
Sorrel et al., (2020)	305	5	30	Europe	Spain	PhD Students
Tompkins et al., (2016)	228	3	27.16	America	USA	PhD Students
Zahniser et al., (2017)	358	5	28	America	USA	PhD Students in Clinical Psychology

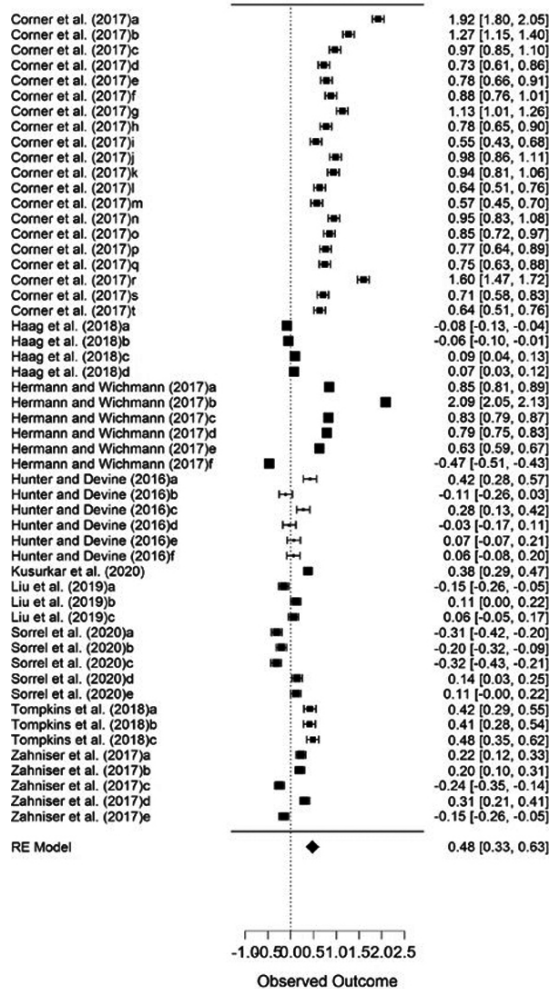
*The studies that comprised the meta-sample are mostly longitudinal studies with several waves. To calculate the total sample, it is necessary to calculate the number of samples by the number of N samples (coinciding with the number of waves of the studies).

Statistical analyses: effect size, heterogeneity and Egger's test

The aim of this study was to explore the association of the variables of remaining in the doctorate programme and the socio-demographic variables (age, gender and geographical area) with personal variables (social support, personality factors and burnout).

Once the sample of coefficients of correlation was obtained, the values were converted to Fisher's Z scores (Martin-Andrés & Luna-del-Castillo, 2004). According to the Forest plot graph (see Figure 2), there was an effect size of $r = .48$, with a lower limit of 0.32 and an upper limit of 0.64, and a statistical significance of $p < .0001$. Likewise, a standard error of 0.084 was obtained, with a Z value of 5.704. The effect size according to Cohen (1988) was moderate.

Figure 2
Forest plot

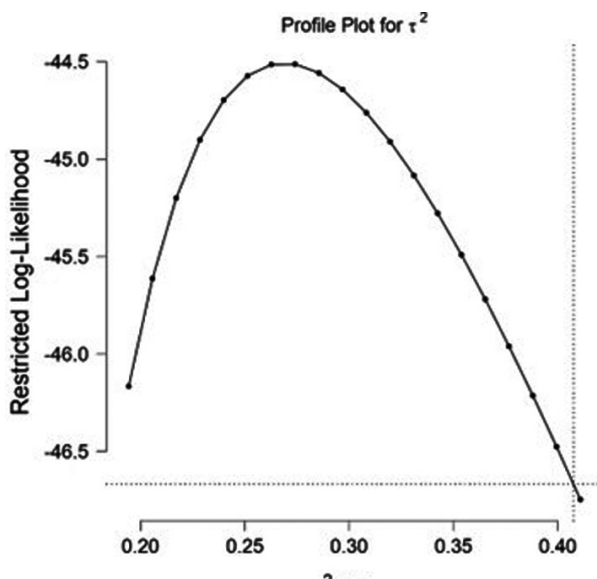


Regarding the factors of heterogeneity, the Q value of Der Simonian and Laird (1986) showed a very high variability, which allows rejecting the hypothesis of homogeneity ($Q = 13403.910$; $df = 57$; $p < .001$). Moreover, it is worth highlighting the value of I^2 , which shows that 99% of the variability is explained by the methodological and sample heterogeneity of the studies ($I^2 = 99.575$) and not by chance (Higgins & Thompson, 2002). These data are in line with the heterogeneity test, which provides a value of $H^2 = 235.156$, supporting the existence of high diversity (Higgins & Thompson, 2002). With respect to the estimation of the meta-

analytic effect by weighting, we obtained $\tau^2 = 0.408$ ($p > .001$), which confirms the previous methodological decision to apply the random effects model (Gualo & Varin, 2012) (Figure 3). To sum up, the heterogeneity analysis shows that the variables of remaining in the doctorate programme are significant. Analogously, it was observed that the sample of the study was very diverse.

Figure 3

Log-likelihood for τ^2 .



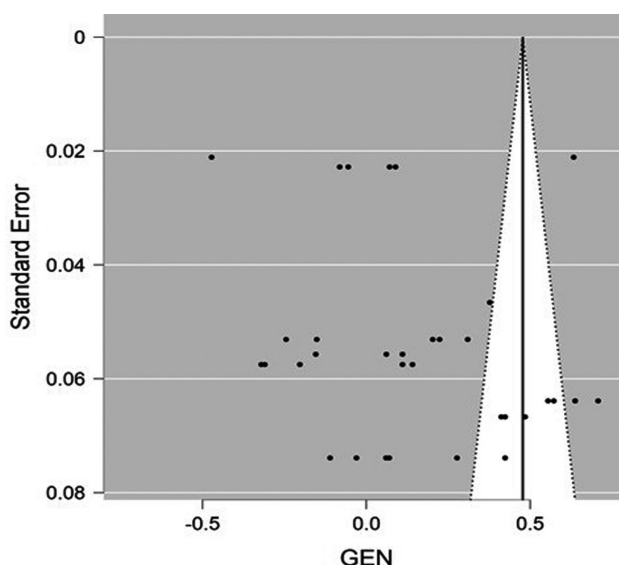
The Omnibus test of model coefficients presented a reliable value of $Q = 32.531$ ($p < .001$) (Aguinis & Edwards, 2014). To sum up, high heterogeneity was confirmed, thus confirming the suitability of working with the random effects model (Bonett & Price, 2015; Martín-Andrés & Luna del Castillo, 2004).

It is important to verify the absence of bias effect (Botella & Sánchez, 2015; Botella & Gambará 2002). To this end, Egger's test was conducted, with 99% reliability. The data confirm the absence of publication bias, showing the following values: $z = 0.380$, $p = .704$ (DerSimoian & Laird, 2015). Moreover, the standard error was not high ($SE = 3.20$), indicating the proximity to the regression line, with this being related to the absence of publication bias (Martín-Andrés & Luna del Castillo, 2004). The rank correlation test for funnel plot asymmetry presents a non-significant Kendall value of $\tau = 0.123$ ($p = .198$), indicating the absence of publication bias.

Furthermore, the funnel graph (Figure 4) reflects the variability that was previously found, corroborating that the source of this variability was the diverse

nature of the studies (Sterne et al., 2011), as was indicated by the heterogeneity indices. After analysing Figure 4, we can state that heterogeneity is high, since there are values scattered from the average. That is, most of the studies of the sample are clearly separated from the figure. These studies present more extreme data, although, during the conversion of a normal curve to a Fisher curve, the values above 0.5 suffered a certain deformation and were even farther from the average. Consequently, it was necessary to carry out a model comparison and a meta-regression that allowed studying these aspects.

Figure 4
Funnel plot



Moderating variables and meta-regression analysis

The review of the scientific evidence showed that there are moderating variables which demand the realisation of comparative models (Botella & Sánchez, 2015) and meta-regression. In this case, the common moderating variables in all the analysed articles are: model 1 – masculine gender; model 2 – feminine gender; model 3 – age; model 4 – geographical area; and model 5 – personal variables (Table 4).

We found that models 2 (feminine gender) and 4 (geographical area) do not explain, at any percentage, the variance of remaining in the doctorate programme. However, model 1 reveals that undertaking a doctorate programme and remaining

in it is explained at 4% by the fact of being a man, with 99% significance. Secondly, with model 3, age explains 17% of remaining in the doctorate programme, with 99% significance, and, with model 5, the personal variables explain 11%, with 99% significance.

Table 4

Model comparison

Model name	TauSq	R²	Q	df	P-Value
<i>Model 1 masculine</i>	0.42	0.04	140004.56	68	<.00
<i>Model 2 feminine</i>	0.42	0.00	140004.56	68	<.00
<i>Model 3 age</i>	0.45	0.17	12213.10	45	<.00
<i>Model 4 geographical area</i>	0.40	0.00	14009.11	73	<.00
<i>Model 5 personal variables</i>	0.36	0.11	10816.78	64	<.00

After analysing the model comparison, the meta-regressions (Table 5) of the statistically significant variables were conducted, corroborating the value of being a man and the value of age, with the evolutionary development and older age being protective factors to remain in the doctorate programme (coefficient = 0.08; SE = 0.06; 95% lower = -0.03; 95% upper = 0.20; $z = 1.35$; $p = .17$). Regarding the personal variables, three regression models were established: a) social support, b) personality variables and c) burnout. With respect to social support (family, institution, and self-esteem), we found that family support along with institutional support and self-esteem explain 11% of remaining in the doctorate programme (98% significance), with self-esteem being the most relevant variable, as is observed in Table 5. Regarding personal variables (self-esteem, emotional intelligence, open-mindedness and responsibility), it was found that self-esteem was the most relevant variable, explaining 6% with $p = .000$. Lastly, burnout explains only 3%, with $p = .000$. It is thus concluded that the most solid explanatory model is social support.

Table 5*Multi-Meta-regression according to personal variables*

	Covariate	Tau²	I²	R²	p
a) Social support*	Intercept	0.1	99.48	<.00	.99
	Family support	0.4	99.48	<.00	<.00
	Family support x Institutional support	0.4	99.48	0.01	<.00
	Family support x Institutional support x Self-esteem	0.35	99.39	0.11	0.02
b) Personality variables **	Intercept	0.4	99.48	0.03	<.00
	Self-esteem	0.4	99.48	0.06	<.00
	Self-esteem x Emotional intelligence	0.4	99.48	<.00	<.00
	Self-esteem x Emotional intelligence x Open-mindedness	0.4	99.48	0.01	<.00
	Self-esteem x Emotional intelligence x Open-mindedness x Responsibility	0.4	99.48	<.00	<.00
	Intercept	0.07	99.48	<.00	.99
c) Burnout***	Burnout	0.4	99.48	<.00	<.00
	Stress	0.4	99.48	0.01	<.00
	Stress x Cynicism	0.4	99.48	0.03	<.00
	Stress x Cynicism x Avoidance	0.4	99.48	0.02	<.00

*We considered those elements related to social support that appeared in the studies: self-esteem, family support (parents, siblings and partners) and institutional support (university management actions, accompaniment of the institution and support from directors or research colleagues).

**We considered those elements of the most relevant theories related to the psychology of personality that appeared in the studies: self-esteem, emotional intelligence, open-mindedness and responsibility.

***We considered those elements related to burnout that appeared in the studies, a total score of: burnout, stress, cynicism and avoidance behaviours.

DISCUSSION AND CONCLUSION

The aim of this study was to explore the association of the variables of remaining in the doctorate programme and the socio-demographic variables (age, gender and geographical area) with personal variables (social support, personality factors and burnout). The statistical results and those of the systematic review show that remaining in the doctorate programme is favoured by being an older man, and that social support (i.e., family support, institutional support and self-esteem) is the model that better explains permanence in the PhD.

Firstly, it is necessary to describe the relevance of gender. A stronger relationship was found between being a man and remaining in the doctorate programme. There are differences in the professional expectations in terms of gender, thus, even though women show a greater desire to enter the academic world of teaching in higher education, they show a low tendency to access research and integrate into the academic world (Guo et al., 2018). In fact, women claim to be more afraid of being discriminated against when looking for a job compared to their male equivalents (Branigan, 2014; Wang, 2018; Wang et al., 2019). Moreover, some authors have also found that women present greater emotional exhaustion and intentions to abandon their academic career (Hunter & Devine, 2016).

Regarding age, it proved to be a very influential variable in PhD dropouts. However, previous research has stated that the older the age of the doctorate student and the lower the social support received, the greater the probability of abandoning the thesis (González-Betancor & Dorta-González, 2020; Hunter & Devine, 2016). Similarly, in a problematic situation, age was the variable that encouraged the doctorate student to request a change of thesis director (González-Betancor & Dorta-González, 2020). Likewise, emotional exhaustion was also a variable that influenced doctorate dropout, increasing with age (Cornér et al., 2017; Hunter & Devine, 2016). According to our results, we hypothesised that age could be mediating more psychological variables, such as resilience. In that sense, the older a person is, the more resilient (Mauno et al., 2012), buffering the impact of stress and increasing the likelihood of remaining in the doctorate.

Although not all the variables corresponded to the individual differences, the environment in which a human being develops plays a key role in any social process. In this sense, it is necessary to work from three models: a) social support (family, institution and self-esteem), b) personality variables (self-esteem) and c) burnout, which explains the problem very poorly.

According to our results, the model that best explains permanence in doctorate studies is social support. This has been one of the most studied variables in its relationship with stress. As was stated by other authors, doctorate students demand support from their peers, families and institutions to which they are

giving their work (Lech et al., 2018; Song et al., 2015; Tompkins et al., 2018). In this sense, our results can be explained by the relevant role of social support as a mediator in the consequences of stress, and this relationship has been widely demonstrated (Levecque et al., 2017; Sverdlik et al., 2018; Tompkins et al., 2018). Moreover, institutional support is of great importance in the case of doctorate studies, as is shown. Positive supervision and support from the thesis directors is positively associated with productivity (Dysthe et al., 2006, Pyhältö et al., 2015), and the latter, in turn, is related to satisfaction and workplace well-being (Hermann & Wichmann, 2017; Miragaia & Aleixo, 2021). In this sense, the feeling of belonging to the scientific community reduces the feelings of loneliness and dissatisfaction (Corner et al., 2017; Hermann & Wichmann, 2017). Similarly, the perception of abusive practices from the institution is considered a discouraging element (Edward et al., 2015). Analogously, it is important to highlight that those students who feel supported by their thesis directors perceive lower levels of stress (Haag, et al. 2018). In this sense, Corner et al. (2017) specified that the empathetic support of the thesis director is essential, with the provision of feedback being a highly valued element. Social support is strongly related to self-esteem, which largely depends on the supported received from the institution (Liu, et al., 2019; Overall et al. 2011) and the social context in which it takes place (Satuf et al., 2018).

The results showed that, indeed, another variable that influences the permanence in doctorate studies is self-esteem. Authors such as Liu et al. (2019) state that self-esteem and self-management are determinant for scientific performance and production within the doctorate programme. Their importance is such that authors like Zahniser et al. (2017) pointed out the need to generate measures that promote self-management and improve self-esteem from doctorate programmes. In this way, the personal variables (or personality variables), with self-esteem as the predominating variable, could be the most influential ones in the abandonment of or permanence in doctorate studies. On its part, the loneliness that doctorate students experience and a highly competitive environment are variables that seem to be mediated by personal and individual traits. In this sense, the social skills of doctorate students, along with their capacity to socialise, constitute a process by which academic skills and competencies are acquired (Hermann & Wichmann, 2017). According to Voitenko et al. (2020), emotional intelligence skills help to manage oneself in a social and working environment. This view points out that high-quality research is not the result of individual discoveries, but synergies (Hermann & Wichmann, 2017). This perspective is in line with previous studies, such as those of Boud and Lee (2005), although it is presented as a minority position against the traditional view of the importance of individualism (Bastalich, 2017; Jara, 2020). That is, it is necessary to recognise the holistic and voluntary practices (Bastalich, 2017; Corner et al., 2017). Furthermore, the frustration that results

from the basic psychological needs pushes doctorate students toward unrest and burnout (Kusurkar et al., 2020). Moreover, the authors of the mentioned study state that the perception of low autonomy and self-esteem seems to be mediated by external variables, which poses a challenge to academic institutions (Kusurkar et al., 2020). In this sense, the behaviour of doctorate students seems to be influenced by the leadership style of the university centre, in a way that a leadership based on integrity and ethics increases the confidence of the researchers (Edward et al., 2020). Thus, responsibility, motivation, the feeling of growth, creativity and productivity are positively correlated with the policies of proactive leadership of the university (Edward et al., 2020). On their part, Voitenko et al. (2020) described the importance of not only self-esteem, but also coping strategies, self-realisation and responsibility (Voitenko et al., 2020). In this sense, it was found that coping strategies varied under emotional stress and exhaustion, as well as due to the desire of satisfying the needs of self-realisation (Voitenko et al., 2020). In this respect, Corner et al. (2017) claimed that the experiences of exhaustion are related to the intention of dropping out. Thus, coping strategies can reduce the stress derived from self-realisation, which is adjusted with time and age (Voitenko et al., 2020).

Lastly, burnout was found to be related to PhD dropout. Other authors had already reported this association, highlighting burnout as one of the main difficulties in the realisation of a doctorate (Kusurkar et al., 2020; Liu et al., 2019; Sorrel et al. 2020; Zahniser et al., 2017). As was previously mentioned, a PhD can be understood as a job (Sorrel et al., 2020), which would explain the appearance of high levels of burnout. Moreover, the diversity of roles can cause a conflict of ambiguity, thus generating a source of additional stress (Zahniser et al., 2017). Likewise, burnout was related to other variables that appeared throughout the course of the study, such as self-esteem and social support, finding that a lack of the latter two would increase the risk of suffering from burnout during a doctorate programme (Blanco-Donoso et al., 2019; Hobfoll & Shirom, 2000). This strong relationship can be explained by the possibility that the main stressors of workers would be those aspects that prevent them from attaining their goals and which generate a lack of existential significance. These aspects affect exhaustion and commitment directly, although they also have an indirect effect through certain personal resources (Hermann & Wichmann, 2017).

The present study has a series of limitations that must be pointed out. Firstly, there is an alarming absence of studies conducted in developing countries, except for Nigeria. Analogously, there is a lack of data on Latin America, Southeastern Asia, Middle East and Oceania. Doctorate studies take place in all nations, and it is the beginning of the scientific and academic career, being an essential part of quality science and higher education. On the other hand, the limited information regarding areas of specialisation, average duration of doctoral studies, economic

compensation, traditional or compilation-based research models, internationally recognized doctorate programs, affiliation with a funded research group, the availability of continuous education provided by the University or Research Centre, as well as the ownership of the centres, presents social limitations that should be analysed in future research.

Further research should include a correlational and longitudinal study with doctorate students and other types of variables, such as the existence or absence of a working contract, attending to the personal variables presented in this study, although also addressing mental health.

As is demonstrated, doctorate studies have a very specific particularity, which is the fact that, in addition to being considered studies of a higher order, they are also understood as work practice. Thus, variables such as being a man, greater self-esteem and greater social support were related to permanence in PhD studies. Moreover, burnout plays a crucial role, fostering doctorate dropout and being strongly related to the previously mentioned variables. Similarly, the role of the family and the closest environment are not the only relevant elements; universities, as organisations, can also favour a suitable, pleasant and motivating environment through democratic leadership styles and by favouring social activities that allow doctorate students to weave socio-affective relationships that provide them with emotional well-being, a learning network and synergies.

It becomes fundamental to promote support to doctorate students in the universities and institutions in which they carry out these studies, favouring a working environment that enables job satisfaction and the increase of self-esteem. This would contribute to improving the mental health of PhD students, reducing the levels of burnout and advancing toward the creation of quality researchers and faculty members.

REFERENCES

- Aguinis, H., & Edwards, J. R. (2014). Methodological wishes for the next decade and how to make wishes come true. *Journal of Management Studies*, 51, 143–74. <https://doi.org/10.1111/joms.12058>
- Ahmed, J., Naz, F. L., Muhammad, W., Nisa, A. U., & Khan, A. U. (2022). The role of self-efficacy in emotional intelligence and career adaptability challenges among PhD scholars. *Journal of Policy Research*, 8(4), 81-87. <https://doi.org/10.5281/zenodo.7485549>
- Bashir, R., Surian, D., & Dunn, A. G. (2018). Time-to-update of systematic reviews relative to the availability of new evidence. *Systematic Reviews*, 7(1), 1-8. <https://doi.org/10.1186/s13643-018-0856-9>
- Bastalich, W. (2017). Content and context in knowledge production: a critical review of doctoral supervision literature. *Studies in Higher Education*, 42(3), 1145-1157. <https://doi.org/10.1080/03075079.2015.1079702>
- Blanco-Donoso, L. M., Moreno-Jiménez, B., Pereira, G., & Garrosa, E. (2019). Effects of co-worker and supervisor support on nurses' energy and motivation through role ambiguity and psychological flexibility. *The Spanish Journal of Psychology*, 22, E25. <http://doi.org/10.1017/sjp.2019.10>
- Blanco-Donoso, L. M., Demerouti, E., Garrosa-Hernández, E., Moreno-Jiménez, B., & Carmona-Cobo, I. (2015). Positive benefits of caring on nurses' motivation and wellbeing: a diary study about the role of emotional regulation abilities at work. *International Journal of Nursing Studies*, 52(4), 804–816. <http://doi.org/10.1016/j.ijnurstu.2015.01.002>
- Bonett, D. G., & Price, R. M. (2015). Varying coefficient meta-analysis methods for odds ratios and risk ratios. *Psychological Methods*, 20(3), 394–406. <https://doi.org/10.1037/met0000032>
- Botella, J., & Gambara, H. (2002). *Qué es el meta-análisis*. Biblioteca Nueva.
- Botella, J., & Sánchez, J. (2015). *Meta-análisis en ciencias sociales y de la salud*. Síntesis.
- Boud, D., & Lee, A. (2005). 'Peer learning' as pedagogic discourse for research education. *Studies in Higher Education*, 30(5), 50-516. <https://doi.org/10.1080/03075070500249138>
- Branigan, T. (28 de enero de 2014). *China: woman settles in first gender discrimination lawsuit*. The Guardian. <https://bit.ly/48XYkPm>
- Broc, G., Shankland, R., Martin-Krumm, C., Carter, S., & Bouteyre, E. (2020). Academic burnout doctorate. Validation of a burnout scale adapted to French PhD students. *Annales Medico-Psychologiques*, 178(5), 517–524. <https://doi.org/10.1016/j.amp.2019.01.011>

- Castelló, M., Pardo, M., Sala-Bubaré, A., & Suñe-Soler, N. (2017). Why do students consider dropping out of doctoral degrees? Institutional and personal factors. *Higher Education*, 74, 1053–1068. <https://doi.org/10.1007/s10734-016-0106-9>
- Corner, S., Löfström, E., & Pyhältö, K. (2017). The relationship between doctoral students' perceptions of supervision and burnout. *International Journal of Doctoral Studies*, 12, 91-106. <https://doi.org/10.28945/3754>
- DerSimonian, R., & Laird, N. (2015). Meta-analysis in clinical trials revisited. *Contemporary Clinical Trials*, 45, 139–145. <https://doi.org/10.1016/j.cct.2015.09.002>
- Devos, C., Boudrenghien, G., Van der Linden, N., Azzi, A., Frenay, M., Galand, B., & Klein, O. (2017). Doctoral students' experiences leading to completion or attrition: a matter of sense, progress and distress. *European Journal of Psychology of Education*, 32(1), 61–77. <https://doi.org/10.1007/s10212-016-0290-0>
- Dysthe, O., Samara, A., & Westrheim, K. (2006). Multivoiced supervision of Master's students: a case study of alternative supervision practices in higher education. *Studies in Higher Education*, 31, 299-318. <https://doi.org/10.1080/03075070600680562>
- Edwards, K. M., Sylaska, K. M., Barry, J. E., Moynihan, M. M., Banyard, V. L., Cohn, E. S., Walsh, W. A., & Ward, S. K. (2015). Physical dating violence, sexual violence, and unwanted pursuit victimization: a comparison of incidence rates among sexual-minority and heterosexual college students. *Journal of Interpersonal Violence*, 30(4), 580–600. <https://doi.org/10.1177/0886260514535260>
- Eslen-Ziya, H., & Yildirim, T. M. (2022). Perceptions of gendered-challenges in academia: how women academics see gender hierarchies as barriers to achievement. *Gender, Work & Organization*, 29(1), 301-308. <https://doi.org/10.1111/gwao.12744>
- Friese, M. & Frankenbach, J. (2020). p-Hacking and publication bias interact to distort meta-analytic effect size estimates. *Psychological Methods*, 25(4), 456-471. <http://doi.org/10.1037/met0000246>
- García-Izquierdo, M., Ríos-Risquez, M. I., Carrillo-García, C., & Sabuco-Tebar, E. (2018). The moderating role of resilience in the relationship between academic burnout and the perception of psychological health in nursing students. *Educational Psychology*, 38(8), 1-13. <http://doi.org/10.1080/01443410.2015.1044944>
- González-Betancor, S. M., & Dorta-González, P. (2020). Risk of interruption of doctoral studies and mental health in PhD students. *Mathematics*, 8(10), 1695. <https://doi.org/10.3390/math8101695>
- Gorbenko, K., Mendelev, E., & Keefer, L. (2020). Can multidisciplinary team meetings reduce burnout? *Journal of Evaluation in Clinical Practice*, 26(3), 863-865. <https://doi.org/10.1111/jep.13234>

- Gualo, A., & Varin, C. (2012). The R package metaLik for likelihood inference in meta-analysis. *Journal of Statistical Software*, 50(7), 1-14. <https://doi.org/10.18637/jss.v050.i07>
- Gube, J., Getenet, S., Satariyan, A., & Muhammad, Y. (2017). Towards «operating within» the field: doctoral students' views of supervisors' discipline expertise. *International Journal of Doctoral Studies*, 12, 1–16. <https://doi.org/10.28945/3641>
- Guo, F., Kang, N., & Shi, J. (2018). Preparation for the scholar's role: first-year doctoral students in Tsinghua University. *Asia Pacific Education Review*, 19(2), 169–185. <https://doi.org/10.1007/s12564-018-9529-6>
- Haag, P., Shankland, R., Osin, E., Boujut, É., Cazalis, F., Bruno, A.-S., Vrignaud, P., & Gay, M.-C. (2018). Stress perçu et santé physique des doctorants dans les universités françaises. *Pratiques Psychologiques*, 24, 1-20. <https://doi.org/10.1016/j.prps.2017.04.005>
- Healy, C., Ryan, Á., Moran, C. N., Harkin, D. W., Doyle, F., & Hickey, A. (2022). Medical students, mental health and the role of resilience – A cross-sectional study. *Medical Teacher*, 1-9. <https://doi.org/10.1080/0142159X.2022.2128735>
- Herrmann, K. J., & Wichmann-Hansen, G. (2017). Validation of the quality in PhD processes questionnaire. *Studies in Graduate and Postdoctoral Education*, 8(2), 189-204. <https://doi.org/10.1108/SGPE-D-17-00017>
- Higgins, J. P. T., & Thompson S. G. (2002). Quantifying heterogeneity in a meta-analysis. *Statistics in Medicine*, 21, 1539–1558. <https://doi.org/10.1002/sim.1186>.
- Hobfoll, S. E., & Shirom, A. (2000) Conservation of resources theory: applications to stress and management in the workplace. En R. T. Golembiewski (Ed.), *Handbook of organization behavior* (pp. 57-80). Dekker.
- Hunter, K. H., & Devine, K. (2016). Doctoral students' emotional exhaustion and intentions to leave academia. *International Journal of Doctoral Studies*, 11, 35–61. <https://doi.org/10.28945/3396>
- Hunter, J. E., & Schmidt, F. L. (2004). *Methods of meta-analysis: correcting error and bias in research findings*. Sage. <http://doi.org/10.4135/9781483398105>
- Izquierdo-Martínez, A. (2007). Psicología del desarrollo de la edad adulta: teorías y contextos. *International Journal of Developmental and Educational Psychology*, 1(2), 67-86.
- Jahanzeb, Z., Parveen, S., & Khizar, U. (2023). Self-control as mediator between emotional intelligence and burnout among doctors. *Journal of Positive School Psychology*, 7(4), 388-400.
- Kim, E., Benson, S., & Alhaddab, T. A. (2018). A career in academia? Determinants of academic career aspirations among PhD students in one research university in the US. *Asia Pacific Education Review*, 19, 273–283. <https://doi.org/10.1007/s12564-018-9537-6>

- Kusurkar, R. A., van der Burgt, S., Isik, U., Mak-van der Vossen, M., Wilschut, J., Wouters, A., & Koster A. (2020). Burnout and engagement among PhD students in medicine: the BEeP study. *Perspectives on Medical Education*, 10, 110-117. <https://doi.org/10.1007/s40037-020-00637-6>
- Ivankova, N. V., & Stick, S. L. (2007). Students' persistence in a distributed doctoral program in educational leadership in higher education: a mixed methods study. *Research in Higher Education*, 48, 93-135. <https://doi.org/10.1007/s11162-0069025-4>
- Jara, M. (2020). Research-based doctoral supervision development programme: learning through peer learning, reflection and case studies. *Innovations in Education and Teaching International*, 58(4) 441-450. <https://doi.org/10.1080/14703297.2020.1786433>
- Jie, L., Xue, H. Wangshuai, W., Gong, S., & Zhiming, C. (2018). How social support influences university students' academic achievement and emotional exhaustion: the mediating role of self-esteem. *Learning and Individual Differences*, 61, 120-126, <https://doi.org/10.1016/j.lindif.2017.11.016>.
- Lech, A. M, van Nieuwerburgh, C., & Jalloul, S. (2018). Understanding the experience of PhD students who received coaching: an interpretative phenomenological analysis. *Coaching: an International Journal of Theory, Research and Practice*, 1(11), 60-73. <https://doi.org/10.1080/17521882.2017.1381753>
- Leonard, D., Becker, R., & Coate, K. (2005). To prove myself at the highest level: the benefits of doctoral study. *Higher Education Research and Development*, 24(2), 135-149. <https://doi.org/10.1080/07294360500062904>
- Levecque, K., Anseel, F., De Beuckelaer, A., Van der Heyden, J., & Gisle, L. (2017). Work organization and mental health problems in PhD students. *Research Policy*, 46(4), 868-879. <https://doi.org/10.1016/j.respol.2017.02.008>
- Li, P., Zhou, N., Zhang, Y., Xiong, Q., Nie, R., & Fang, X. (2017). Incremental Theory of Intelligence moderated the relationship between prior achievement and school engagement in Chinese high school students. *Frontiers in Psychology*, 8, 1703. <https://doi.org/10.3389/fpsyg.2017.01703>
- Liu, C., Wang, L., Qi, R., Wang, W., Jia, S., Shang, D., Shao, Y., Yu, M., Zhu, X., Yan, S., Chang, Q., & Zhao, Y. (2019). Prevalence and associated factors of depression and anxiety among doctoral students: the mediating effect of mentoring relationships on the association between research self-efficacy and depression/anxiety. *Psychology Research and Behavior Management*, 12, 195-208. <https://doi.org/10.2147/prbm.s195131>
- López-Nicolás, R., López-López, J. A., Rubio-Aparicio, M., & Sánchez-Meca, J. (2022). A meta-review of transparency and reproducibility-related reporting practices in published meta-analyses on clinical psychological interventions (2000-2020).

- Behavior Research Methods*, 54, 334–349. <https://doi.org/10.3758/s13428021-01644-z>
- Maresca, G., Corallo, F., Catanese, G., Formica, C., & Lo Buono, V. (2022). Coping strategies of healthcare professionals with burnout syndrome: a systematic review. *Medicina*, 58(2), 327. <https://doi.org/10.3390/medicina58020327>
- Martin-Andrés, A., & Luna-Del-Castillo, J. D. (2004). *Bioestadística para las Ciencias de la Salud*. Norma-Capitel.
- Mattijssen, L. M., Bergmans, J. E., van der Weijden, I. C., & Teelken, J. C. (2021). In the eye of the storm: the mental health situation of PhD candidates. *Perspectives on Medical Education*, 10, 71–72. <https://doi.org/10.1007/s40037-02000639-4>
- Mathur, A., Chow, C. S., Feig, A. L., Kenaga, H., Moldenhauer, J. A., Muthunayake, N. S., Ouellett, M. L., Pence, L. E., & Straub, V. (2018). Exposure to multiple career pathways by biomedical doctoral students at a public research university. *Plos One*, 13(6), 1–14. <https://doi.org/10.1371/journal.pone.0199720>
- Mauno, S., Ruokolainen, M., & Kinnunen, U. (2013). Does aging make employees more resilient to job stress? Age as a moderator in the job stressor–well-being relationship in three Finnish occupational samples. *Aging & Mental Health*, 17(4), 411–422. <https://doi.org/10.1080/13607863.2012.747077>
- McAlpine, L., Skakni, I., & Pyhältö, K. (2022). PhD experience (and progress) is more than work: life-work relations and reducing exhaustion (and cynicism). *Studies in Higher Education*, 47(2), 352–366. <https://doi.org/10.1080/03075079.2020.1744128>
- Miragaia, D., & Aleixo, J. (2021) Organisational productivity: perceptions about the influence of workplace physical activity programs on performance, wellness and worker satisfaction. *European Journal of International Management*, 15, 2–3. <https://doi.org/10.1504/EJIM.2021.113266>
- Montgomery, A. P., & Patrician, P. A. (2022). Work environment, resilience, burnout, intent to leave during COVID pandemic among nurse leaders: a cross-sectional study. *Journal of Nursing Management*, 30(8), 4015–4023. <https://doi.org/10.1111/jonm.13831>
- Moreau, D., & Gamble, B. (2020). Conducting a meta-analysis in the age of open science: tools, tips, and practical recommendations. *Psychological Methods*, 27(3), 426–432. <https://doi.org/10.1037/met0000351>
- O’Meara, K., Jaeger, A., Eliason, J., Grantham, A., Cowdery, K., Mitchall, A., & Zhang, K. J. (2014). By design: how departments influence graduate student agency in career advancement. *International Journal of Doctoral Studies*, 9, 155–177. <https://doi.org/10.28945/2048>
- Open Science Collaboration. (2015). Estimating the reproducibility of psychological science. *Science*, 349(6251). <https://doi.org/10.1126/science.aac4716>

- Overall, N. C., Deane, K. L., & Peterson, E. R. (2011). Promoting doctoral students' research self-efficacy: combining academic guidance with autonomy support. *Higher Education Research & Development*, 30(6), 791–805. <https://doi.org/10.1080/07294360.2010.535508>
- PRISMA Group. (2020). *PRISMA: Transparent reporting of systematic reviews and meta-analyses*. <https://bit.ly/400Jtzs>
- Pyhältö, K., Vekkaila, J., & Keskinen, J. (2015). Fit matters in the supervisory relationship: doctoral students and supervisors perceptions about the supervisory activities. *Innovations in Education and Teaching International*, 52(1), 4-16. <https://doi.org/10.1080/14703297.2014.981836>
- Satuf, C, Monteiro, S, Pereira, H, Esgalhado, G, Afonso, R., & Loureiro, M. (2018). The protective effect of job satisfaction in health, happiness, well-being and self-esteem. *International Journal of Occupational Safety and Ergonomics*, 24(2), 181-189. <http://doi.org/10.1080/10803548.2016.1216365>
- Schmidt, M., & Hansson, E. (2018). Doctoral students' well-being: a literature review. *International Journal of Qualitative Studies on Health and Well-Being*, 13(1). <https://doi.org/10.1080/17482631.2018.1508171>
- Sorrel, M. A, Martínez-Huerta, J. A., & Arconada, M. (2020). It must have been burnout: prevalence and related factors among Spanish PhD students. *The Spanish Journal of Psychology*, 23, E29. <https://doi.org/10.1017/SJP.2020.31>
- Song, J., Bong, M., Lee, K., & Kim, S.-I. (2015). Longitudinal investigation into the role of perceived social support in adolescents' academic motivation and achievement. *Journal of Educational Psychology*, 107(3), 821–841. <https://doi.org/10.1037/edu0000016>
- Sterne, J. A., Sutton, A. J., Loannidis, J. P. A., Terrin, N., Jones, D. R., Lau, J., Carpenter, R., Rücker, G., Harbord, R. M., Schmid, C. H., Tetzlaff, J., Deeks, J. J., Peters, J., Macaskill, P., Schwarzer, G., Duval, S., Altman, D. G., Moher, D., & Higgins, J. P. T. (2011). Recommendations for examining and interpreting funnel plot asymmetry in meta-analyses of randomised controlled trials. *British Medical Journal*, 343, d4002. <https://doi.org/10.1136/bmj.d4002>
- Sverdlik, A., Hall, N., McAlpine, L., & Hubbard, K. (2018). The PhD experience: a review of the factors influencing doctoral students' completion, achievement, and well-being. *International Journal of Doctoral Studies*, 13, 361-388. <https://doi.org/10.28945/4113>
- Tompkins, K. A., Brecht, K., Tucker, B., Neander, L. L., & Swift, J. K. (2016). Who matters most? The contribution of faculty, student-peers, and outside support in predicting graduate student satisfaction. *Training and Education in Professional Psychology*, 10(2), 102–108. <https://doi.org/10.1037/tep0000115>
- Wang, X., Wang, C., & Wang, J. (2019). Towards the contributing factors for stress confronting Chinese PhD students. *International Journal of Qualitative Studies*

on Health and Well-Being, 14(1). <https://doi.org/10.1080/17482631.2019.1598722>

Wang, Y. W. (19 de enero de 2018). *Exploitative professor blamed in doctoral student's suicide*. Sixth Tone. <https://bit.ly/46JheYi>

Zahniser, E., Rupert, P. A., & Dorociak, K. E. (2017). Self-care in Clinical Psychology graduate training. *Training and Education in Professional Psychology*, 11(4), 283–289. <https://doi.org/10.1037/tep0000172>

