

Doctoral Student Perceptions of Supervisory and Research Community Support: Their Relationships with Doctoral Conditions and Experiences

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Abstract

Social support is important for the successful completion of doctoral studies. The aim of this study was to explore how individual differences in supervisory and research community support are related to doctoral experiences (abandonment intentions, perceived engagement, interest, satisfaction, burnout and stress) and doctoral conditions (phase and work modality). In total, 1313 students from 56 Spanish universities completed a doctoral experience survey. A k-means cluster analysis was used to group the students by the level of social support they received from supervisors and the research community. Two social support profiles, reduced and adequate support were identified. The results indicate that doctoral students with a reduced support profile were less engaged, interested and satisfied with their doctoral studies and more likely to experience burnout and stress and to report drop out intentions than those with an adequate support profile. Furthermore, most students with a reduced support profile were in the first phase of their doctorate and reported mainly working individually. The results reinforce the need, in doctoral programs, to improve supervisory and research community support, especially for those students beginning their doctoral studies.

Key words: doctoral education, social support, student engagement, academic development, burnout.

Introduction

During the journey of earning a doctorate, doctoral students face high intellectual and emotional challenges that, without sufficient support, frequently lead to feelings of stress and burnout, which are associated with doctoral attrition (Stubb, Pyhältö & Lonka, 2011; Sverdlik, Hall, McAlpine, & Hubbard, 2018). The high rate of attrition among doctoral students is currently a major concern for doctoral education programs (Caruth, 2015), especially in Spain, where the attrition rate is particularly high (between 70 and 90%, de Miguel Díaz, 2010; Castelló, Pardo, Sala-Bubaré, & Suñe-Soler, 2017). Increased and adequate social support from supervisors and the community in which doctoral students participate can help reduce doctoral attrition and facilitate academic progress, thus leading to a higher rate of doctoral program completion (Jairam & Kahl, 2012; Gardner, 2010). However, previous studies show that not all doctoral students receive the same amount and type of support (Jairam & Kahl, 2012), and many students have insufficient support when addressing the complexities of the doctoral journey (Castelló et al., 2017).

Despite the evidence concerning the importance of social support in doctoral development, research related to this topic is still scarce in Spain, and no studies specifically focused on the role of social support in doctoral development (Castelló, et al., 2017; Corcelles, Cano, Liesa, González-Ocampo & Castelló, 2019; Sala-Bubaré, Peltonen, Pyhältö, & Castelló, 2018). To the best of our knowledge, this study is the first to examine individual variation among Spanish doctoral

candidates in relation to their perceived supervisory and research community support and how these perceptions are related to doctoral conditions (doctoral phase and work modality) and overall doctoral experiences (perceived engagement, interest, satisfaction, burnout, stress and abandonment intentions in doctoral education). This analysis could lead to the identification of at-risk Spanish doctoral students and improve the performance of social support systems to reduce Spanish doctoral attrition.

Theoretical framework

Social support comprises the social resources provided to doctoral students by their social environment, including formal and informal relationships within the research community and with peers, supervisors and other staff members (Vekkaila, Virtanen, Taina, & Pyhältö, 2018). Supervisory and research community support systems are crucial for not only providing emotional and intellectual resources to candidates to facilitate their learning and research progress but also providing opportunities to collaborate with other researchers, which increases doctoral students' participation as active members in their respective researcher communities (Sverdlik et al., 2018).

Supervisors are among the most important sources of social support and have the greatest influence on individuals' doctoral experiences (Edwards, Bexley, & Richardson, 2011; Sverdlik et al., 2018). Receiving support from supervisors is related to increased productivity, employment and overall satisfaction with research experience, even after the doctorate (Horta, 2009; Scaffidi & Berman, 2011). Thus, the quality of the student-supervisor relationship is relevant because it can affect students' short-term success and long-term outcomes (Scaffidi & Berman, 2011). Low satisfaction with supervision and lacking or inadequate supervision often make doctoral students feel unable to cope with doctoral study demands and, thus, experience burnout (Corner, Löffström,

& Pyhältö 2017). Reducing doctoral students' burnout symptoms is important for reducing the rate of dropout intention (Stubb et al., 2011; Sverdlik et al., 2018). In this regard, recent research has shown that improvements in different aspects of supervision lead to improvements in doctoral students' well-being and research progress. These aspects include the quality and quantity of supervision—with several different types of supervision activities—and supervisors' constructive feedback and emotional support (Corner et al., 2017; González-Ocampo & Castelló, 2019; McAlpine, 2013; Pyhältö, Vekkaila, & Keskinen, 2015; Vekkaila et al., 2018). The supervisory approach (research team or supervisor-student dyad) also has a large influence on doctoral students' perceived support from their supervisory and research communities (Chiang, 2003; Pyhältö et al., 2015). A study by Chiang (2003) showed that supervision in a research team training approach (in which doctoral students and their supervisors work together on research projects cooperatively with other members of the research group) was more supportive than supervision in an individualistic supervisor-student dyad approach (in which doctoral students work mostly individually on their projects). Interactions between doctoral students and their supervisor(s) were more frequent and informal, and doctoral students received more support from other members of the research team with a supervisory research team approach. As a result, doctoral students had an increased sense of collegiality and felt more valued, less isolated, and more fully recognized in their research community. Therefore, supervisors are also relevant in helping doctoral students increase their social networks, collaborate with, and receive support from well-established members of the research community (Lunsford, 2012, Zihlerl, Igllic, & Ferligoj, 2006; Coromina, Capó, Coenders & Guia, 2011).

The research community and how doctoral students participate in such a community also play a crucial role in their development (Hasrati, 2005; Martinsuo & Turkulainen, 2011). Therefore, research community support, which is defined as the perceived support from doctoral

students' research team, department, faculty or national and international researchers (Stubb et al, 2011), is another important source of social support that is complementary to the support offered by supervisors.

Opportunities to interact with other researchers from or beyond the research team, communicate scientific advances and receive expert feedback have a large positive influence on doctoral students' journeys (Corcelles et al., 2019). In contrast, feelings of social isolation from the research community negatively affect doctoral experiences and are related to a high risk of doctoral attrition (Ali & Kohun, 2007) and to burnout (Corner et al., 2017). Moreover, students who perceive themselves as valuable members of their scholarly community exhibit good well-being, a high level of interest, and a high level of achievement in their doctoral studies (Sverdlik et al., 2018; Pyhältö, Peltonen, Castelló, & McAlpine, 2019).

Although previous research highlighted the relevance of supervisory and research community support for doctoral students, more research is needed to analyze the different perceptions of this type of social support and how these different perceptions are related to doctoral students' overall experiences and doctoral study conditions. To the best of our knowledge, only one study conducted by Peltonen, Vekkaila, Rautio, Haverinen, & Pyhältö (2017) analyzed supervisory and research community support among Finnish doctoral students. These authors found the following two perceived social support profiles of the supervisor and research community: sufficient and insufficient support. Their results showed that although most doctoral Finnish students reported having sufficient support, a significant number of students received insufficient support. These students suffered more burnout, were less satisfied with their supervision, and were more likely to consider dropping out than the students with sufficient

support profiles. No differences in gender, work modality or time expected to candidacy were found between the students with sufficient and insufficient support.

In Spain, Phyältö, McAlpine, Peltonen, and Castelló (2017) analyzed supervisory and research community support among postdoctoral researchers from the UK and Spain. Similar to Peltonen et al. (2017), the study by Phyältö et al. (2017) identified two social support profiles: *adequate* and *reduced* supervisory and research community support. The postdoctoral researchers who had *adequate support* were more engaged and less likely to experience burnout or consider dropping out than those who had *reduced support*. Moreover, the postdoctoral researchers with *adequate support* were more likely to work in a research group than work independently.

While these studies are undoubtedly valuable, the role of social support in Spanish doctoral students' development is still unclear. Our aim in this study is to analyze supervisory and research community support profiles among Spanish doctoral students.

Our specific research questions are as follows:

RQ1: How do PhD students perceive the supervisory and research community support they receive during their doctoral studies?

RQ2: Are there different PhD student profiles in terms of research community support and supervisory support?

RQ3: How do the profiles differ in terms of dropout intention, perceived engagement, interest, satisfaction, burnout and stress during doctoral studies?

RQ4: How do the profiles differ in terms of the doctoral phase and work modality?

Methods

Participants

In total, 1313 doctoral students (58.5% female; *Age Mean*=36.33) from 56 universities in Spain from different disciplines participated in the study (see Table 1). Most participants (74.7%) reported working on their doctorate individually without collaboration with a research team. In total, 35.1% of the participants were in the first phase of their studies (more than two years expected to candidacy), and 64.9% of the participants were in the second phase (less than two years expected to candidacy)¹ (see Table 1).

Table 1. *Study population characteristics*

Variable	Values	Frequency	Percentage
Gender (n=1247)	Female	730	58.5 %
	Male	517	41.5%
Age (n=1247)	Under 30	343	27.5%
	From 30 to 39	535	42.9%
	From 40 to 49	236	18.9%
	50 or over	133	10.7%
Discipline (n=1312)	Education	311	23.7%
	Economics	173	13.2%
	Psychology	170	13.0 %
	Law	106	8.1%
	Political Sciences	132	10.1%

¹ The phases of doctoral education were distinguished by considering the students' expectancy to candidacy because we wanted to focus on students' representation of the end of their doctoral journey more than the years enrolled in their doctoral education program.

	Arts & Humanities	196	14.9 %
	Health Sciences & STEM	224	17.1%
Work modality (n=1313)	Individual	981	74.7 %
	Research Team	332	25.3%
Phase in the doctorate (n=1241)	1st phase	435	35.1 %
	2nd phase	806	64.9 %

Data collection

The data were collected through an online questionnaire (*Doctoral Experience Survey*²) based on previously validated instruments (Castelló, McAlpine & Pyhältö, 2017). This survey included five items concerning demographics and research conditions (see Table 1), one Likert-type question concerning *satisfaction* with doctoral studies, and 39 questions grouped into the following four categories: *engagement* (5 items), *interest* (16 items), *social support* (9 items) and *burnout* (9 items) in doctoral studies (see Table 2 for more details regarding the scales, alpha values and factors). Work-related stress was measured by Elo, Leppänen, and Jahkola's (2003) single-item stress scale, i.e., “*Stress means feeling nervous, uneasy, distressed or having difficulties sleeping because of things that are bothering you. Do you have such feelings?*” The responses were rated using a Likert-type scale that ranged from 1 to 7. The students' *dropout intentions* were measured

² A full version of the *Doctoral Experience Survey* is available for free download on the project's website www.researcher-identity.com

with one item that asked the students whether they had considered dropping out of their doctoral studies (yes/no).

Table 2. Scales, factors and values of the Doctoral Experience Survey

Scale*	Factor	Items	
Engagement (alpha=0.929)	Engagement: degree of commitment and dedication to research	I am enthusiastic about my research	
		I feel happy when I start working on my research	
		My research inspires me	
		When doing my research, I feel vigorous	
		When I conduct research, I feel that I am bursting with energy	
Interest (alpha=0.902)	Work position: interest focused on finding a work position. (alpha=0.809)	I want to get a better position	
		I want to get a better salary	
		A degree is required in my future work	
		My job prospects are better with a doctoral degree	
			After graduating, I want to get a postdoc at a university
	Personal development: interest focused on personal development. (alpha=0.845)	I want to complete what I started	
		I want to develop my skills	
		I want to develop myself	
		Finding out new things is fascinating	
			I want to have a doctoral degree
Community: interest focused on contributing to the community and facing challenges. (alpha=0.866)	I am inspired by my research topic		
	I am inspired by my work as a researcher		
	I want to contribute to my field of research		
	I want to work in a research community		
	My research is useful for others		
		I enjoy intellectual challenges	
Social Support (alpha=0.909)	Supervisors' support: degree of supervisors' personal support and acknowledgement (alpha=0.934)	I feel that my supervisor(s) appreciates my work	
		I feel appreciated by my supervisor(s)	
		I receive encouragement and personal attention from my supervisor(s)	
		I can openly discuss any problems related to my doctoral education/postdoc research with my supervisor(s)	
Research community support: degree of community support and acknowledgement. (alpha=0.848)		I feel accepted by my research community	
		I feel that the other members of my research community appreciate my work	
		I receive encouragement and support from the other researchers	
		There is a good sense of collegiality among the researchers with whom I interact	

My expertise is put to use in the research community

Burnout (alpha=0.852)	Cynicism: loss of interest in one's own research (alpha=0.857)	I feel that my doctoral studies are useless
		I feel that I am losing interest in my doctoral studies
		I have difficulties finding any meaning in my doctoral studies
		I used to have higher expectations of my doctoral studies than I currently do
		I often feel that I fail at my doctoral studies
Exhaustion: excessive load of work and responsibility (alpha=0.743)		I feel overwhelmed by the workload of my doctoral studies
		I often sleep badly because of matters related to my doctoral studies
		I brood over matters related to doctoral studies a lot during my free time
		The pressure of my doctoral studies causes me problems in my close relationships with others

*All scales were 7-point Likert Scales

We contacted the doctoral schools and doctoral programs at 75 universities in Spain and asked them to participate in the project. Fifty-six universities (74.5%) agreed to collaborate and sent the link to the online survey to their doctoral students (n=4687). All participants received written and oral information regarding the project and provided consent to participate³. The questionnaire was available for 3 months, and during this period, we sent 3 reminders to encourage the participants to respond or complete the questionnaire. We collected 1888 questionnaires (40.28% response rate). After discarding the responses from individuals who did not complete the *social support* scale, 1313 questionnaires remained.

Data analysis

³ The following various ethics and research committees approved the study: the Ethics Committee of the authors' university (CER-URL-2013/005) and the Spanish Ministry of Economy and Competitiveness (Ref.: CSO2013-41108-R).

After conducting a descriptive analysis, we performed a k-means cluster analysis to group the participants based on the scores on the items of the social support scale (SPSS, v.21). K-means is considered superior to hierarchical methods because it is less affected by outliers and the presence of irrelevant clustering variables and is recommended for sample sizes larger than 500 (Sarstedt & Mooi, 2014). We tested the cluster solutions with two, three and four clusters. Similar to previous studies (Peltonen et al., 2017; Pyhältö et al., 2017), the two-cluster solution was retained as this solution was the most theoretically and empirically sound. Once we identified the clusters, we carried out a Chi-square test, Crammer's V test, and independent-samples *t*-test to assess the differences between the two groups in the remaining variables.

Results

How do PhD students perceive the supervisory and research community support they receive during their doctoral studies?

The descriptive analysis results (see Table 3) showed that in general, the doctoral students felt that they received medium-high supervisory and research community support. Most participants reported that they felt they received support from their supervisor; they especially responded positively to *feeling that the supervisor appreciated their work and being able to openly discuss any problems related to their doctoral education*. The items with lower scores were related to the research community as follows: *I feel accepted by my research community and my expertise is put in use in the research community*.

Table 3. Means and standard deviations of the social support scores of the study population (n=1313)

Factor	Mean (SD)	Item	Mean (SD)
Supervisors' support	5.56 (1.60)	I feel that my supervisor(s) appreciates my work	5.53 (1.74)
		I feel appreciated by my supervisor(s)	5.65 (1.66)
		I receive encouragement and personal attention from my supervisor(s)	5.43 (1.83)
		I can openly discuss any problems related to my doctoral education/postdoc research with my supervisor(s)	5.62 (1.74)
Research community support	5.01 (1.35)	I feel accepted by my research community	4.74 (1.69)
		I feel that the other members of my research community appreciate my work	4.93 (1.63)
		I receive encouragement and support from the other researchers	5.22 (1.76)
		There is a good sense of collegiality among the researchers with whom I interact	5.20 (1.77)
		My expertise is put to use in the research community	4.87 (1.62)

Are there different doctoral student profiles in terms of supervisory and research community support?

The results of the cluster analysis revealed the following two groups of doctoral students who differed in the characteristics of their perceived research community and supervisory support (see Table 4): Reduced support and Adequate support. The students in the *Reduced support* cluster (412 participants; 31.4%) reported significantly lower levels of supervisory and research community support than those in the *Adequate support* cluster (901 participants; 68.6%).

Table 4. Final cluster centers and ANOVA statistics

Variables	Final Cluster Centers		Cluster		Error		F	Sig.		
	Reduced Support	Adequate Support	Mean Square	df	Mean Square	df				
Supervisory support	I feel that my supervisor(s) appreciates my work	S1	3..51	6.45	2443.377	1	1.175	1311	2080.160	.000
	I feel appreciated by my supervisor(s)	S2	3..78	6.50	2100.714	1	1.140	1311	1843.240	.000
	I receive encouragement and personal attention from my supervisor(s)	S3	3..33	6.39	2650.565	1	1.336	1311	1984.488	.000
	I can openly discuss any problems related to my doctoral education/postdoc research with my supervisor(s)	S4	3..94	6.38	1686.338	1	1.739	1311	969.759	.000
Research community support	I feel accepted by my research community	C1	3.22	5.44	1397.486	1	1.775	1311	787.483	.000
	I feel that the other members of my research community appreciate my work	C2	3.44	5.61	1332.159	1	1.655	1311	805.163	.000
	I receive encouragement and support from the other researchers	C3	3.87	5.83	1087.032	1	2.264	1311	480.188	.000
	There is a good sense of collegiality among the researchers with whom I interact	C4	3.74	5.87	1277.157	1	2.159	1311	591.652	.000
	My expertise is put to use in the research community	C5	3.75	5.39	756.920	1	2.059	1311	367.685	.000

How do the profiles differ in terms of doctoral phase and work modality?

The results showed significant differences between the two profiles. The Chi-square test and Cramer's V test (see Table 5) revealed that the students with *adequate support* were more likely to be in the second phase of their doctoral studies (less than two years to expected defense). The doctoral students with *adequate support* were more likely to be conducting their doctoral studies in collaboration with a research team, and those with *reduced support* were more likely to work individually.

Table 5. Differences between the groups in doctoral conditions

Variable	Values	Reduced Support	Adequate Support
Work modality*** (n=1313)	Individually	367	614
		(28%)	(46.8%)
		z=8.1	z=-8.1
	Research Team	45	287
		(3.4%)	(21.9%)
		z=-8.1	z=8.1
Phase* (n=1241)	1st	154	281
		(12.4%)	(22.6%)
		z=2.3	z=-2.3
	2nd	234	572
		(18.9%)	(46.1%)
		z=-2.3	z=2.3

Note: z: corrected standardized residuals; * $p < .05$; ** $p < .01$; *** $p < .001$

How do the profiles differ in terms of dropout intention, perceived engagement, interest, satisfaction, burnout and stress in doctoral studies?

The Chi-square and Cramer's V tests showed that the doctoral students with *adequate* supervisory and research community *support* had a significantly lower rate of dropout intention from their studies than those with *reduced support* (see Table 6).

Table 6. Differences between the groups in the intention to dropout from doctoral studies

Variable	Values	Reduced Support	Adequate Support
<i>Intentions to dropout</i> *** (n=1288)	No	197	685
		(15.3%)	(53.2%)
	Yes	z=-10.5	z=10.5
		209	197
		(16.2%)	(15.3%)
		z=10.5	z=-10.5

Note. z: corrected standardized residuals; *** $p < .001$

Furthermore, the t-test analysis (see Table 7) showed that the doctoral students with *adequate support* reported significantly higher levels of engagement and satisfaction than the students with *reduced support*. Additionally, the doctoral students with *adequate support* reported higher levels of interest in *contributing to the community and facing challenges, finding a work position, and personal development*. Consistently, the *adequate support* group also expressed feeling lower levels of stress, cynicism and exhaustion than the students in the other group (see Table 7).

Table 7. Differences between the groups in engagement, interest, burnout, satisfaction and stress

Variables	Reduced Support	Adequate Support	<i>t</i>	<i>df</i>
	Mean (SD)	Mean (SD)		
<i>Engagement</i> (n=1313)	4.82 (1.42)	5.80 (1.02)	-12.72***	612.0
<i>Interest 1: work position</i> (n=1313)	5.63 (1.12)	6.21 (0.76)	-9.63***	593.1
<i>Interest 2: personal development</i> (n=1313)	5.13 (1.39)	5.42 (1.43)	-3.49**	1311
<i>Interest 3: community</i> (n=1313)	6.30 (0.88)	6.55 (0.59)	-5.33***	588.4
<i>Burnout: cynicism</i> (n=1290)	3.99 (1.59)	2.59 (1.40)	15.23***	707.1
<i>Burnout: exhaustion</i> (n=1290)	4.19 (1.37)	3.70 (1.44)	5.76***	1288
<i>Satisfaction</i> (n=1288)	3.74 (1.55)	5.40 (1.99)	-18.77***	676.0
<i>Stress</i> (n=1290)	4.46 (1.82)	3.62 (1.90)	7.49***	1288

Note. ** $p < .01$; *** $p < .001$

Discussion

This study sought to identify the social support profiles of Spanish doctoral students and the relationships between these profiles and their research experience. Similar to previous studies conducted with doctoral students and postdoctoral researchers (Peltonen et al., 2017; Phyltö et

al., 2017), our analysis allowed us to identify two different student profiles, namely, *reduced* and *adequate support*, which were consistent with previously identified profiles. Although most doctoral students in our sample experienced medium-high supervisory and research community support and, thus, were classified in the *adequate support* cluster, a significant number of doctoral students experienced insufficient support and had a *reduced support* profile.

Regarding doctoral experience, our results are consistent with previous studies showing a relationship among social support, burnout and dropout intention (Peltonen et al., 2017; Corner et al., 2017, Stubb et al, 2011, Sverdlik et al, 2018; Ali & Kohun, 2007). Additionally, consistent with the findings of previous studies, we found that supervisory and community support have an impact on students' interest and engagement in their doctoral studies (Edwards et al., 2011; Phyältö et al., 2017). Therefore, our study contributes by increasing the empirical evidence suggesting that social support is a determinant of not only the successful completion of a doctoral degree but also the overall experience and satisfaction (Jairam & Kahl, 2012; Gardner, 2010).

Regarding doctoral conditions, in contrast to the study by Peltonen et al. (2017) involving Finnish doctoral students, we found significant differences between the two social support profiles in the time expected to candidacy and work modality. Most Spanish doctoral students with the *adequate support* profile were in the second phase of their doctoral studies (less than two years to expected defense) and worked mainly in a research team. These differences might be explained by the different cultural and doctoral educational backgrounds, although more research is needed to further explore how the cultural context might mediate the relationship between social support and researchers' stage of development. In our study, the doctoral students in the early stages of their doctorate experienced lower social support, which might explain why these students have been found to have a higher risk of attrition (Castelló et al, 2017).

Furthermore, our results seem to indicate that experiencing supervisory and research community support is related to being involved in a research team, providing additional empirical evidence for considering research teams as an important source of social support that can increase individuals' levels of engagement, interest and satisfaction in doctoral studies and decrease feelings of burnout and stress (Stubb et al., 2011; Pyhältö et al., 2019). Working in a research team can lead to more opportunities for networking and collaborations than working primarily individually (Coromina et al., 2011; Zihlerl, et al., 2006; Pyhältö, et al., 2019). Although previous studies have suggested that individuals in a research team do not always work collaboratively (Zihlerl, et al., 2006), our study suggests that research teams can lead to higher levels of perceived support, which is crucial for doctoral research development and needs to be promoted by doctoral programs.

Despite these contributions, this study has limitations. First, this study adopted a cross-sectional design, and the results were based on answers to a questionnaire. This approach allowed us to explore a large amount of data and establish the profiles of doctoral students, offering a clear and reliable overview of the doctoral students' social support perceptions. Overall, an in-depth qualitative analysis of these issues might shed light on how the participants interpret community support and supervisory support and determine which particular situations and types of support mostly affect the doctoral trajectory and the analyzed variables. This information can contribute to explaining the development of and variation within the profiles. We already collected interview responses from a subpopulation and plan to explore the variation in the profiles and types of social support through studies using mixed-method designs.

Second, our results suggest that perceived social support varies along the doctoral trajectory. Longitudinal studies could explore how supervisory and community support change and evolve during the doctorate journey.

Finally, we found that the students who work mainly in a research team were more likely to have an *adequate* supervisory and community profile, leading to many unanswered questions regarding the type of work and support that are carried out within a research team, especially in the early stages of doctoral studies. However, we did not differentiate the support received from the research team from that received from other members of the research community. Future research concerning this important issue is warranted to more deeply analyze the types of research team support as a specific variable and better understand their effect on doctoral experiences.

Conclusions

Overall, our study reveals that more supervisory and research community support, including support to help doctoral students to be involved in a research team, is needed at the early stage of doctoral studies. Our study provides empirical evidence suggesting that many doctoral students in Spanish universities have difficulties in obtaining adequate supervisory and research community support and effectively collaborating with their research team, especially in the first phase of their doctoral studies. Therefore, our findings provide insights for developing more functional support systems in Spanish Doctoral Education Programs, reinforcing the need to improve supervisory and research community support from the beginning of doctoral studies to reduce the high rate of doctoral attrition in the early stage of doctoral studies. We propose that doctoral programs need to strengthen their commitment to providing institutional support to not

only doctoral students but also supervisors and research teams, which are the main training and support structures for doctoral students.

Supervisors, especially new supervisors, need to be provided with resources and training to learn how to provide *adequate* support to their doctoral students. Moreover, institutions need to support the adoption of team supervision to increase the research community support provided to doctoral students and create a context in which students have greater agency to become involved in the research community from the beginning of their doctoral studies (McAlpine, 2013; Chiang, 2003).

In this study, we stressed the relevance of supervisory and research community support in the development of doctoral education programs in Spain. We hope that our findings contribute to improving doctoral education and completion rates at Spanish universities by identifying doctoral students with *reduced* support profiles as early as possible and assisting them with better and more effective social support systems.

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