Stress in doctoral supervision: A perspective on supervisors

Ali Padyab and Martin Lundgren

Abstract

The research on stress in doctoral education has largely focused on doctoral researchers' well-being. However, also doctoral supervisors experience stress. This study aims to uncover the dimensions of stressors related to doctoral supervisors and different sources of stress experienced by them. Interviews with doctoral supervisors were conducted to gather evidence of doctoral supervisor stress. We identified eight stressors, of which three were shared between the supervisor and the doctoral researcher: time pressure, balancing work and personal time, and doctoral researcher's project. Other sources of stress for doctoral supervisors were related to the defence day, organisational and administrative factors, engagement with the student's personal issues, managing "out-of-scope activities", and the supervisor's relationship with their co-supervisor. The insights gained from this study may assist supervisors in finding coping strategies to minimise their stress. Moreover, it can be a step towards understanding how the impact on supervisor's stress might be theorised.

Keywords: doctoral supervisor; stress; stressor; supervision; supervisor stress

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Introduction

The high number of doctoral graduates indicates the attractiveness of higher education in Sweden. According to a report from 2022 by Statistics Sweden (SCB)—a government agency responsible for producing official statistics—during the period 1973–2020, there have been 86,737 doctoral graduates in Sweden, with an average of 1,807 graduates per year. In the Swedish higher education system, doctoral researchers are assigned one primary supervisor and a co-supervisor (sometimes more) who work with the doctoral researcher for four years of full-time studies.

Unsurprisingly, doctoral researchers and supervisors are under considerable pressure (Burford, 2018) and therefore they feel stress during doctoral studies (Jacobsson & Gillström, 2006; Kurtz-Costes et al., 2006; Toews et al., 1993, 1997). Most studies, however, have focused on stress from a doctoral researcher's perspective (Angervall & Silfver, 2019; Burford, 2018; Eliasson, 2019; Levecque et al., 2017).

This study aims to uncover the dimensions of stressors related to doctoral supervisors in Sweden. From a physiological perspective, a *stressor* is a stimulus event that challenges the integrity or health of the body, triggering a stress response, the body's compensatory reaction to that challenge (Lovallo, 2015). The stress response is often described as a person's 'response mechanism' or a 'survival reaction' to an adverse event (Baum et al., 2001). Such adverse events are prevalent during doctoral supervision, which causes both doctoral researchers and supervisors to experience stress.

For a doctoral researcher, stressors have been reported in various studies. Previous research indicates that studying for a doctorate is a stressful experience, and many students consider quitting their studies because of stressors. Existing research has identified, for example, time-to-degree completion (Baird, 1993), commitment conflict (Pychyl & Little, 1998), financial stress (Abedi & Benkin, 1987), and uncertainty (Lovitts, 2002) as critical stressors during doctoral studies. In a short review on stressors, Cornwall et al. (2019) found that lack of family support, feeling isolated, lack of funding, coursework, dissertation work, lack of sleep, and spare time are some of the stressors that doctoral researchers—and in particular early-stage doctoral researchers—might face. In a similar study on Master's students, Irizarry and Marlowe (2010) found that a lack of academic confidence, differences in teaching methods, and language barriers could create high stress. Stressors like these have been reported to affect doctoral researchers' work, well-being, and health (Schmidt & Hansson, 2018; Wisker, 2012).

Stress is not experienced only by doctoral researchers, but also by their supervisors. Stress experienced by them—particularly less experienced supervisors—could affect their supervision, and mental health. Prior research in this area has primarily focused on the doctoral researcher, leaving research on stressors experienced by the supervisors relatively narrow. In some countries (e.g., Sweden), doctoral supervisor training is mandatory, while in others there is little or no explicit training (Phillips & Pugh, 1994; Richards & Fletcher, 2020). However, making supervisors aware of challenges regarding their well-being, such as stress, is a necessity via training or other means (Wisker & Robinson, 2016). It has been observed that doctoral researchers refrained from getting help from their supervisors because they noticed that their supervisors were stressed and therefore did not want to be a burden (Berry et al., 2020). However, the stressors experienced

by the supervisors seem to have received comparatively little research attention. Therefore, the research question for this study is: What stressors do supervisors experience during the period of supervising doctoral researchers? The data consist of interviews with five supervisors in Swedish universities to investigate what stressors are relevant according to their experiences. We argue that supervisors experience a variety of stressors during doctoral supervision. While doctoral education varies between countries and continents (Byram & Stoicheva, 2021), we believe our study could serve as a starting point to discuss supervisor stress on a Swedish and international level.

The article is outlined as follows. In the next section, we review previous studies related to stress and stressors related to doctoral supervision. Then, we explain the research methodology employed to investigate our research question. The identified dimensions of doctoral supervisor stressors are presented in the results chapter. Finally, we discuss our results and the implications for research and practice.

Stress and stressors

The word *stress* can be traced back to the 13th century French *distress*, meaning 'circumstance that causes anxiety or hardship' (etymonline, n.d.). Stress is a personal experience that can be both positive and negative. However, stress adverse outcomes can damage physical and psychological well-being (Cherniss & Sarason, 1980; Kinman, 1998), leading to the experience of unpleasant emotions, such as tension, frustration, anxiety, anger, burnout, and depression (Kyriacou, 1987). These emotions can be the result of demands that were not met or failed to be completed, thereby causing a perceived feeling of threat from, e.g., losing face or esteem to oneself, or in the eyes of others, to a fear of dismissal for incompetence (Kyriacou, 1987). That which causes these emotions has been defined as a 'stressor' (Ursin & Eriksen, 2004). Put differently, stressors are the creators of or 'stimulus that causes' stress (Merriam-Webster, n.d.).

Building upon the rationale outlined in the introduction, previously identified stressors relevant for doctoral researchers (Cornwall et al., 2019) can, with slight adaptations, be seen from the perspective of the doctoral supervisor. The following six stressors derive from Cornwall et al. (2019) and have been adapted and extended with additional sources to reflect the perspective of the doctoral supervisor instead.

Time pressure

This stressor relates to doctoral researchers finding a research question and finishing on time (Pychyl & Little, 1998). Supervisors similarly experience time pressure, ensuring that students finish on time (Naidoo & Mthembu, 2015). Pressure to complete on time is a pressing need since completion rates have reputational and financial implications (Halse & Malfroy, 2010). Some countries even include a financial penalty for the institution upon failure to complete doctoral studies within the institutional regulations (Parker-Jenkins, 2018).

Academic community

This stressor refers to the sense of not belonging before adjusting to their new role, experiencing a lack of strong departmental or informal support and causing a sense of isolation (Cornwall et al., 2019; Lonka et al., 2014). However, the same can also be argued for doctoral supervisors. Naidoo and Mthembu (2015) found that doctoral supervisors often experience supervision as overwhelming, even causing feelings of fear, loss of confidence as an academic, a sense of isolation, and a general lack of support systems.

Thesis process

This stressor relates to the uncertainty of the doctoral process (Cornwall et al., 2019; Lonka et al., 2014). While doctoral supervisors have experience on their own thesis process, it does not mean they are necessarily ready to supervise (Jackson et al., 2009). This is compounded by the fact that in various countries, there is continuing resistance to professional supervisor development, particularly from senior researchers (Christie & Adawi, 2006; Manathunga, 2005). Supervisors not skilled in the research process could be asked to take on supervision responsibilities prematurely. For example, in some research fields, such as nursing, doctorally prepared nurses are scant and, therefore, sometimes assigned supervision tasks with little research experience outside their own doctoral studies (Jackson et al., 2009; Murareneza et al., 2020).

Financial support

This stressor relates to potential future financial concerns if a doctoral researcher is unable to finish their studies on time (Caesens et al., 2014; Cornwall et al., 2019; Lonka et al., 2014). However, obtaining and spending research funding has similarly been stressful for supervisors (Bruce & Stoodley, 2013). Obtaining research funding is becoming increasingly competitive when the number of students seeking research education is increasing in many countries, but where the number of doctoral supervisors is not (McCallin & Nayar, 2012).

Quality of the advisor/advisee relationship

This stressor relates to poor communication and mismatching expectations between the doctoral researcher and supervisor (Cornwall et al., 2019; Earl-Novell, 2006). In Carter and Kumar's (2017) study, tension sometimes arose from feedback, which often challenges doctoral researchers emotionally. The high emotional response made supervisors hesitant to give rigorous feedback, potentially demotivating both the student and the supervisor.

Work/life balance

This stressor relates to the difficulties in balancing time between academic work and family, social, and recreational activities (Cornwall et al., 2019). Considering that doctoral researchers expect their supervisors to provide well-prepared, timely, and constructive feedback on the text, supervisors are also challenged by balancing research, teaching, and management activities with non-academic matters (Severinsson, 2012).

In summary, a stressful situation contributes to negative experiences in the doctoral process. Drawing on the stressors related to doctoral researchers, we argue that the doctoral supervision is faced with potential sources of stress for both doctoral researchers and supervisors. Despite abundant research on stressors related to the doctoral researcher, research on the supervisor stressors is somewhat narrow. Therefore, this study aims to determine doctoral supervisors' stressors in the supervision journey.

Research methods and data

We opted for qualitative research, an 'epistemological position described as interpretivist, implying that […] the emphasis is on the understanding of the social world through an examination of the interpretations of that world by its participants.' (Bryman, 2012, p. 380). Through this approach, it was possible to study supervisor stress when contextualised within the practices and experiences while supervising doctoral researchers.

Empirical data were collected by conducting interviews to capture the reasoning around supervisor stressors. The interview is a distinguished qualitative data collection method that allows the researchers to capture complex phenomena and experiences from the participants' narratives (Kvale, 1996). A semi-structured interview protocol was developed based on the insights from a previous study on stressors related to doctoral researchers during their early-stage studies (Cornwall et al., 2019). In their study, Cornwall et al. (2019) identified six main areas related to stress during the early-stage doctoral study: time pressure, uncertainty about

doctoral processes, sense of belonging in scholarly communities, financial pressures, doctoral researcher-supervisor relationship, and balancing work and social life. In this study, those key stressors were employed as the underlying themes of the interview. The semi-structured nature of the interview allowed us to follow up on the interviewee's answers and be open to the themes that might emerge beyond the interview protocol. Nineteen open-ended questions were formulated as a basis for the interviews. Each question was open-ended to avoid leading the interviewees' answers and to discuss the motivations and reasoning for the respondents' answers. The interview questions are listed in Appendix 1.

Five doctoral supervisors from our network of contacts were invited to the interview. At the time of the interviews, all of them resided within Sweden. For ethical considerations, no names nor institutions are revealed, and we have pseudonymised the participants' names according to Greek alphabet letters to ensure anonymity. The participants had many years of experience supervising doctoral researchers, as depicted in Table 1.

Table 1. Overview of participants.

The pseudonym	Completed or ongoing doctoral theses supervised	Years of supervision experience	Interview language	Disciplinary background
Alpha	2	5	Swedish	Information Systems
Beta	7	11	Swedish	Information Systems
Gamma	3	22	English	Information Systems
Delta	15	20	English	Information Systems
Epsilon	8	40	Swedish	Information Systems

Each interview lasted between 45 and 60 minutes and was recorded. The interviews were then partially transcribed (Wildemuth, 2016), and due to the risk of the researcher neglecting essential aspects of naturally occurring speech, all interviews were additionally analysed using the original audio recordings (Wainwright & Russell, 2010). The analysis was done in two phases. First, we analysed the data using concept-driven coding to categorise the answers from the lens of the six stressors in which we adhered to the principles outlined by Mayring (2002) for deductive content analysis. In the second phase, the authors went through the uncoded material and categorised the content to derive other stressors using the principles of inductive category development (Mayring, 2002). In the end, each of the coded stressors was then put into a new document and synthesised for similarity and differences between the possible stressors experienced by all supervisors.

Results

The results showed that eight sources of stress are relevant for doctoral supervisors. Three of these stressors were similar to previous findings related to doctoral researchers. These include time allocation, balancing work and personal time, and doctoral researcher's project. New identified sources of stress concerned the defence day, organisational and administrative factors, getting engaged with the student's personal issues, managing out of scope activities, and the supervisor's relationship with their co-supervisor. All stressors are discussed below.

Time allocation

The participants brought up the issue of time allocated to supervision affecting their stress in different ways. We found that there were four dimensions related to time allocation as a stressor: 1) inability to predict time for planning, 2) time used for administrative work, 3) allocating time to different doctoral researchers equally, and 4) time pressure for publishing articles.

Regarding the first dimension, two interviewees thought that planning the supervision time was hard for them. In this regard, the time it might take to supervise an occasion is hard to predict and plan. For example, an estimation of a supervisor to give feedback might be that it would take one hour. However, due to unforeseen circumstances, it ends up taking three hours instead. This inability to predict the time allocation for focusing on supervision was a stress factor. Another stressor was related to the time needed to give feedback, and if this time is too short, the supervisor would feel stressed because they have to compromise their personal time.

Second, administrative work, like filling out and planning the individual study plan (ISP)[1] were another dimension of time allocation. According to Epsilon, bureaucracy was mentioned as a stressful activity, noting that 'it is stressful to plan, fulfil, and submit the ISP on time [...] which is not something I, as a researcher, want to be spending my time on.' Epsilon continued that another part of this issue is that plans are not always so easy to follow, quoting 'plans are useless, but planning is important,' and explained that the mere planning activity is more vital for a supervisor than that the plan is documented and followed to the letter.

The third dimension of time allocation was related to the number of students to supervise. It is difficult for a supervisor to dedicate an equal amount of time for all students; one student might get more attention than the other. One interviewee, Gamma, reported that 'a stressful situation relates to balancing the time given to the

[1] The individual study plan (ISP) is a governing document used in Swedish universities which serves as a tool for planning and following up the PhD researcher's and the supervisors' work throughout the entire doctoral education process.

student fairly since the students might suspect that there is a favourite student among them.' Delta perceived the number of students as an opportunity to use time more effectively. According to Delta's experience, to help balance the time allocation, all students and the supervisor should work as a team. Consequently, the students perceive that their supervisor has allocated supervision time equally.

The stress related to pressure to publish deemed as the fourth dimension of time allocation. The supervisors explained that the pressure to publish academic work to succeed in an academic career was a stress factor. Since supervisors know that the student should publish a defined number of articles within a timeframe as a requirement, they found it labour-intensive to help them during this process. Related to the fourth dimension is the intensity and inability to predict the review process and its time to get published. Delta describes how the act of supervision becomes a burden:

> You are editing a paper a student has written, and because of publication requirements, you know what the student should be saying, but you [the supervisor] know what the student needs to say in order to get published, so it is the publish or perish burden I found annoying and stressful … It is easy to get out a [conference] publication, but it is hard to get out a good journal publication.

Balancing work and personal time

One source of stress that the participants mentioned were challenges related to their work/life balance. The fact that the supervisor cannot do something else (e.g., during the weekends) affected their stress level. One interviewee noted that freetime is a strange concept in academia because the boundary between personal and career time is narrow. Alpha noted, 'I know of some very accomplished colleagues who have been sitting at home with kids and supervising during evenings […], but that is what you have to do to get ahead sometimes.' What makes it even more stressful, continued Alpha, is that

> I have accepted to help the student, so I need to start thinking about what other tasks I can remove to make time for it. Supervision is not just about reading, but talking with the student and discussing.

Beta, in turn, explained that after years of experience, the importance of trying to clear spare time, especially weekends, from work has become more evident, but not always possible. They explained, for example, that 'sometimes there are projects that should be renewed and at the same time one of my students is about to defend their thesis. That could become very stressful.' Consequently, the supervisors still need to use their spare time to manage the workload.

Doctoral researcher's project

Ensuring that the doctoral researcher is financed during their studies also caused the supervisors to be stressed. The current institutional system expects supervisors to find external resources (e.g., research projects) to fund doctoral researchers, rather than using institutional funds. Regarding projects, one supervisor mentioned that finding a project that is in line with the type of research question of the doctoral researcher is a big challenge. The interviewees mentioned that coping with supervisees' demands could also cause stress. They were concerned, for example, that the doctoral researcher might become too attached to the project and focus less on their own research. One interviewee mentioned that sometimes supervisors do not have the authority over the funds in the project. The fact that the projects added more responsibility than authority to the supervisors stressed them. For example, Beta explained that supervisors 'do not always differentiate between the role of the project leader and the role of supervisor.' In Beta's comparison, 'the focus when in the role of a project leader is to complete certain deliverables, whereas, in the role of a supervisor, the focus is on supporting the process of the student's academic education.'

The defence

In Sweden, the doctoral defence is a public event, in which doctoral researchers will defend their doctoral thesis, answer questions asked by an expert in the field (*the opponent*), and receive a pass or fail grade from an examination committee. There were some stressors discussed by the interviewees related to the doctoral defence. The first dimension was finding a grading committee that fulfils the requirements of the faculty. One supervisor, Delta, for example, found it difficult to deal with the gender balance requirement: they were struggling to find a female referee with expertise on the doctoral researcher's thesis topic.

The second dimension of this stressor was associated with the grading committee's approval on whether to pass or fail the doctoral researcher. In this case, the supervisor would feel stressed if the examination committee judged that the result would not be sufficient, and part of the blame would be on the supervisor to propose that the doctoral researcher was ready, while the committee would suggest otherwise. Or, as Epsilon put it, 'what is most stressful is the end of the doctoral research process, is the thesis really good enough, as the reputation of the supervisor is also in question.' It falls on the supervisor to ensure that the thesis 'has scientific reasoning and depth,' added Epsilon. Gamma, in turn, compared the Swedish defence with a defence process of a foreign university:

> The procedure in Sweden mostly prevents this [failing at the day of defence], but there are much tougher regimes where failure is possible even in the final defence. We once had a collaboration with a university abroad with the goal of a dual-PhD between our university [in Sweden] and their university, and their model of the examination is that the supervisor and the student do not know in advance who the examination committee is. So, only on the date at the defence, you'll see the examiners for the first time. I think I would be, as a supervisor, highly nervous if you have such a system. In our system [Swedish], we can foresee whether examination will be successful by this form of pre-defense.

Organisational and administrative factors

During the interviews, one point that kept coming up as a factor that caused stress was the lack of organisational support. All participants had a similar experience and pointed out the lack of support in their institution. For example, questions around time allocation and funding for supervision were nonexistent, or, as Beta put it, 'there is zero financing, all of it comes down to my own spare time.' Alpha had a similar experience, saying, 'so far, I have not gotten a dime for supervision.' One reason, as Alpha reasoned, was that 'much within academia is built around trying to advance your career, and one important part of that is supervision.' Alpha further explained that this, especially for a less accomplished supervisor, can add stress over having the doctoral researcher complete their doctorate.

Participants believed that the institutions directly impact the stress level of the supervisors. For example, the administrative routines of reporting would be stressful, especially if there is no support. On the other hand, the administration could decrease the supervisors' stress by, for example, supporting them with the help of professional proofreading for doctoral researchers' manuscripts or getting support with their other major life stressors. Other organisational or administrative stressors impacting the supervisors were time-budget allocation, lack of resources,

expectations for research output, and the demand to supervise multiple doctoral researchers at the same time. Regarding resource allocation, one supervisor brought up that creating courses caused them stress. Moreover, if courses that the doctoral researchers have to attend as part of their studies are not officially funded, it creates stress for the supervisors to fight with the institution to resolve the funding issues. In the same regard, Delta mentioned that resource allocation had positively affected their stress levels:

> One of the stressful jobs I have done as a supervisor was to proofread students' work. But, that has been improved because the cost of having a professional editor has gone down. This is a resource that eliminates some of the stress.

Doctoral researcher

The interviewees mentioned that the psychological issues experienced by doctoral researchers could cause them to become stressed. In cases when the supervisee is not feeling well due to, for example, a death in their family or a financial crisis, the supervisors feel that they have to step in and support the supervisee. One interviewee mentioned that a supervisor's support is related to the lack of a good social support network for doctoral researchers (for detailed discussions on the positive role of large-group collaboration, please refer to Rouse's article in the same special issue). The stress caused by the doctoral researcher was also related to activities which required the supervisor to do something new. For instance, one interviewee felt stressed out if they had to learn a new platform to work with (e.g., Overleaf).

When asked what caused the most stress in relation to the doctoral researcher, the respondents addressed similar points. For example, Alpha explained that 'perhaps the most stressful is when I feel I cannot get through to the student when the student does not seem to see the seriousness in their studies… That affects my motivation.' Similarly, Beta said it causes stress 'when the student cannot communicate or work independently, or is unaware of basic academic practices, like citations and referencing,' since it becomes too much to work with. Respondents then added the discomfort of seeing the doctoral researcher going through the stress and anxiety that often occurs during the process, albeit not directly related to stress: 'It is tough to see, but I cannot act like a shrink; all I can do is to try to support them as a colleague,' noted Beta, whereas Alpha similarly explained how 'many [doctoral researchers] feel very stressed, and it is difficult for me too to see them suffer.'

One approach that was mentioned to help distance the supervisor from the stress and pressure felt by the students was to separate the person from the 'thing'

[the thesis]. For example, 'I, in the role of supervisor,' explained Beta, 'oversee the "thing," the thesis process, but I, in my role as a colleague, support the person.' In other words, Beta believed that separating the two roles (the supervisor and the colleague) decreases the supervisor stress. For example, if the student is unable to progress in their work, the supervisor could support the doctoral researcher as any other colleague who is currently struggling to improve their work.

Nevertheless, stress due to halting doctoral research processes did not always arise from the doctoral researcher's inability to progress in their work. For example, Epsilon explained that on some occasions, doctoral researchers who have shown great promise and academic talent have decided to quit their doctoral program for one reason or another and ended up with a new job in the industry instead. 'This has been very frustrating [...] and it feels a bit like a failure [...] but in the end, I have to realise that, if the student seems pleased with their decision and enjoys their new work, then it is for the better.'

Out of scope activities

The tasks that are secondary for a supervisor were deemed as a stressor and had varying effects on the stress on the supervisor. The role that the supervisor played seemed to cause stress. For example, Epsilon found that, while supervising doctoral researchers, some of them were given more and more departmental duties (e.g., teaching), which then fell on the supervisor to oversee that the doctoral researcher would not end up being 'exploited by the institution.' Another example was given by Delta of being a language editor for their supervisee. This caused them stress because this type of work is secondary to them and not as enjoyable as a supervisor, that is, to supervise:

> For me, it [stressful situation] is sometimes about the type of supervision, like you are sitting with the student and I am teaching them about the grammar of spelling rather than teaching them how to reflect… In some cases, I am spending eight hours reading, correcting, and editing a paper, so I turn into an editor rather than a supervisor, so my role has to change from being a supervisor to an editor… and this causes me stress because I do enjoy being a supervisor but not as much as being an editor.

Co-supervisor

The eighth and the final issue was related to co-supervisors. Interviewees reported experiences that they had experienced themselves, or something they had witnessed among colleagues. For example, co-supervisors were reported to be solely interested in increasing their publication numbers, rather than supporting their supervisees. A multidisciplinary field of study could also add to the supervisor's

stress because they would have to find a co-supervisor who is an expert in another related discipline. The relationship between the supervisors could add to the primary supervisor's stress level. Gamma noted that 'there is a saying that if there are too many chefs, the meal does not taste good! … inside a supervisor team, different viewpoints can pop up, which may create stress for the supervisors, but mostly for the student.' The interviewees pointed to cases where a co-supervisor had to step in as a primary supervisor because a doctoral student had changed their (previous primary) supervisor. The stress was caused by the fact that the newly appointed supervisor would not fully understand why there was a clash in the first place and the difficulty of predicting if such a clash would repeat itself.

Discussion

This study aimed to determine the stressors that supervisors experience during the period of supervising doctoral researchers. The study revisited six previously identified stressors relevant to doctoral researchers but was modified to take the supervisor's perspective instead. After conducting interviews with five doctoral supervisors, the results showed that the sources of stress for the doctoral supervisors were time allocation, balancing work and personal time, doctoral researcher's project, the defence day, organisational and administrative factors, getting engaged with the student's personal issues, managing out of scope activities, and the supervisor's relationship with their co-supervisor.

In this article, the context of the study was Swedish doctoral education. However, the findings could be relevant to an international audience. We have attempted to conceptualise the stressors that they could be applicable to other contexts. For example, handling ISP by a supervisor is a requirement in the Swedish education system. However, on a general level, it affects the supervisor's time, which is caused by the work environment. Many studies in different countries have pointed toward the increased stress level within academia through the work environment, such as British (Fontinha et al., 2019), Australian (Gillespie et al., 2001; Winter & Sarros, 2002), Dutch (Taris et al., 2001), and South African (Barkhuizen & Rothmann, 2008) higher education institutions. For example, in Australia, the participants in Gillespie et al.'s (2001) study expressed that administrative activities as a source of stress and that unrealistic deadlines imposed by management and administration put pressure on academics.

The findings show that some of the stressors that the participants in this study brought up were relevant to those of doctoral researchers (Cornwall et al., 2019; Pappa et al., 2020). For example, stress was experienced from real-vs-actual time to supervise since working during spare time is not uncommon in academia. Previous research has noted that traditionally academics tend to accept doctoral researchers as an addition to other duties (Phillips & Pugh, 1994), which causes stress and is associated with the perceived supervisor's professional identity (Wisker & Robinson, 2016). Another similarity was related to financial concerns associated with doctoral researcher's projects. Hobfoll (2001) argues that stress will occur 'where individuals fail to gain sufficient resources following significant resource investment' (Hobfoll, 2001, pp. 341–342). Studies on doctoral researcher's stress have noted that inadequate funding can result in higher stress levels (Hockey, 1994); this seems to indicate a similar effect on supervisor's stress when securing project funding for the doctoral researcher.

The results proposed that personal stressors experienced by the doctoral researcher could lead to the supervisor being stressed. Literature has addressed personal issues related to family social support, financial issues, and social isolation of the doctoral researcher, causing them to experience stress (Mills, 2009; Myers et al., 2012). However, their effect on the supervisor has remained uncovered. Our results indicated that personal issues trigger a sympathising effect on the supervisor, impelling them to react emotionally, intellectually (Strandler et al., 2014), and financially (as expressed by one of the participants). This finding contributes to the prior research by indicating that alleviating some stressors related to the doctoral researcher may ease some of the stress experienced by their supervisors. Some studies have highlighted that the supervisor plays an important role in supporting doctoral researchers to lower their stress (Kovach Clark et al., 2009), but what remains interesting for future research is to explore how supervisors can support the doctoral researcher while they themselves are affected by the doctoral researcher's stress.

Stress is costly to both the university and the individual. However, lessons learned from the supervisor stressors give rise to proactive coping strategies for increasing well-being in the workplace. Wisker and Robinson (2016) advised that the mechanism of involvement in supervisor support and development systems and team supervision strengthen the academic workplace as a community that could be further activated to support supervisors. The role of institutional support in allocating time, finances, and resources for doctoral education has been significantly discussed in the literature as well (Cornwall et al., 2019; Hockey, 1994; Turner et al., 2015; Wisker & Robinson, 2013). We posit that community support could take the form of toolboxes created by the supervisors and shared within different academic communities. In this regard, discussions on supervisor

stress could be included in self-reflection and dialogue (see Mahon, this issue). Our results showed that stress coping strategies are not always one-size-fits-all and sometimes are contradictory between the supervisors. For example, one supervisor found the increasing number of doctoral researchers as a stress factor, while another found it as stress relief due to the team synergy. In this regard, strategies promoted on a departmental level could help not only in increasing supervisors' awareness of stress, but also inform them how to cope better with such issues.

Moreover, most strategies have converged on institutions and supervisors helping students (Wisker & Robinson, 2016). However, with the positive role of institutions in mind, the question of whether the doctoral researcher can relieve the stress of their supervisor remains open for future research. Additionally, supporting supervisors via institutions through the doctoral researchers' channels is an interesting avenue worth exploring.

The results have important implications for finding strategies that could help supervisors decrease their stress levels that benefit the well-being of supervisors and doctoral researchers. The identified stressors offer a base for future research by, for example, expanding the number of respondents. Implications of such research could increase our understanding of stress amongst supervisors and how to explicitly include it in doctoral supervision education, but also as a step towards how the impact of supervisor's stress might be theorised. In this regard, the effect of each stressor on the other party could be interesting to research.

This paper is not free from limitations. The context of this research was in connection with Swedish doctoral education. Although some elements of doctoral supervision are universal, many aspects are still rooted in the contextual nuances that sometimes stem from the local regulations. Relevantly, this research was conducted with five supervisors from the same discipline. It could be the case that supervisors in other disciplines could experience different stressors. Therefore, caution should be sought when interpreting the results.

Conclusions

Doctoral supervisors have mainly been left alone in the field of stress-related research. This study provides insight into doctoral supervisors' stressors during their time supervising doctoral researchers. Drawing on the previous studies regarding stressors among doctoral researchers, we identified eight stressors, of which three were shared between the supervisor and the doctoral researcher. These include time allocation, balancing work and personal time, and doctoral researcher's project. Other sources of stress we identified were related to the defence day, organisational and administrative factors, getting engaged with the

student's personal issues, managing out of scope activities, and the supervisor's relationship with their co-supervisor. The results strengthen our argument that supervisors experience a variety of stressors during doctoral supervision.

Taken together, mitigating stress during the doctoral study should be a joint effort through the participation of various actors. We suggest that the first step is to acknowledge that some of the burdens of the supervisors could be eliminated by addressing doctoral researcher-related stressors, as reflected in the student-supervisor relationships and practices (Wisker & Robinson, 2016; Mahon, this issue). Next, doctoral supervisors should be given a chance to reflect upon their supervision-related stress. In this regard, the role of institutions for interventional support should not be taken for granted. Ways of successfully managing stress is a learning process that requires a broader discussion among the community of supervisors continuously. Furthermore, these discussions should be embedded within the processes and practices of the institutional frameworks. From a research perspective, future research could develop different stress factors based on the results of this research to measure and test whether a particular factor produces expected outcomes.

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Appendix 1

Opening statement

These are some questions related to your experience as a supervisor and the potential stress, burden, or anxiety it may cause. Your answers will be treated completely confidential, and there are absolutely no "right" or "wrong" answers, just your own thoughts and experiences as supervising Ph.D. students. The interview will be used in an assignment for Ph.D. supervision and possibly extended into some form of academic publication, and I will send out the consent form about this later on.

Before we start, I want to tell you that this interview is going to be recorded. That is only for my benefit to be able to engage in the discussion more without having to concentrate on taking notes. After the transcript is completed, the recording will be deleted, is that OK with you?

- Perhaps we could start with just an opening question, how many students or years of experience would you say you have?

Trigger	**Interview Questions**
Time allocation, anxiety	● How would you frame the purpose of research education? ○ How would you define your role and influence as a supervisor over the Ph.D. researcher? ● From your experience, tell me a bit about the time allocation for supervising a Ph.D. researcher. ○ Has it ever happened that you feel anxious over the amount of time, perhaps too much or too little time? ■ Is the matter of time something that can be stressful? ○ What about the task itself, to supervise, did/does it ever make you feel pressured? (e.g., too much to do, ambiguous, or too much responsibility) ■ Do you have any examples?
Academic community as a source of burden	● If we go back a bit in time, how come you became a supervisor in the first place? ○ Did you explicitly seek to supervise or were you tasked with it? ○ Have you ever felt supervision to be a burden? (e.g., that it affects other duties or tasks?)

	■ Does it cause less time for other things and thereby more stress in general? ■ Do you have an example? ● How do you manage to help or situate the student that you supervise into the academic community? ○ Could the sharing of contacts or networks feel a bit strainful for you? ○ Have you ever felt that the student reflects back onto you? (e.g., their progress, charisma, etc?) ■ Is that something that can affect your supervision? ● In your role as being tasked to supervise, what would you say is the most burdensome on the supervisor? ○ To find projects and financing? (Could/Does it cause you stress?)
Academic community as a source of empowerment	● If we turn the question around, in your experience as a supervisor, could it ever be that you become so engaged with a student and his/her work that becomes exhaustive? ○ Perhaps anxiety for not being able to engage as much as you would like to? (or feel required to?)
Thesis as a process, product, or both	● Looking at the final product of the Ph.D. researcher, the thesis, do you as a supervisor ever experience worry to have your student complete their thesis on time? ○ Would you say that causes you stress? ■ In what way? ○ What do you typically do if you feel they might not finish on time? ■ Do you have an example? ● What about being concerned over other tasks during the Ph.D. studies, such as getting enough publications published? ○ Would you say that causes you stress? ■ In what way? ○ What do you typically do if you notice that the student might not be able to reach the expected number of publications? ■ Do you have an example?
Perceived organizational support	● In terms of organizational support in your role as a Ph.D. supervisor, how do you perceive it to be? ○ Could you elaborate a bit? ○ Are there/Have there been situations where you have to do more than is required by the role as a

	supervisor? ■ How is that? Stressful? ■ Do you have an example? ● Have you ever experienced a lack of resources? (E.g., such as time, money, staffing?) ○ Do you have an example? ○ How did that make you feel?
Receiving enough feedback	● From your history of supervising Ph.D. researchers, what role would you say communication between you and the student has played? (Important?) (E.g., coffee talks, regular meetings, weekly stand-up meetings, hallway small talk) ○ How about feedback, it is often that the supervisor gives feedback to the student, but do you ever get feedback from your students on your supervision? ■ Do you think you get enough of it? ■ Does it / could it help you to become more secure in your supervision? ● Could you tell me if you have had students for whom it has been difficult to get insights on their expectations from you as a supervisor? ○ Is that something that can affect you as a supervisor? (e.g., cause you stress or uncertainty)
Discontent with atmosphere	● Looking at the atmosphere where you work, is that something that could cause you to stress in your role as a supervisor? ○ Perhaps related to there being no drive or energy at the subject level? ○ How does it affect you and your supervision if there is no drive or energy with the Ph.D. researchers?
Experiences of stress, anxiety, exhaustion, and lack of interest	● What sort of things do supervisors stress about regarding supervision? ○ How does/can it affect your supervision? ○ Is this something that is manageable? ○ Is there time to recover? ○ Several Ph.D. researchers to supervise at once? ● What do supervisors worry about? ○ How does/can it affect your supervision?
Consider interrupting supervision	● Have you ever considered interrupting the supervision? (e.g., not being able to "get rid of" a Ph.D. researcher (even though Ph.D. researchers can get rid of a supervisor) ○ What affected your ability to supervise?

	● What influence would you say the ISP has on the Ph.D. researcher and the expected work? ○ Does it cause less or more stress having this individual plan outlined?
Less satisfied with student's work	● In terms of the student's work during their Ph.D. studies, would you say your satisfaction with their work affects you as a supervisor? (e.g., not being motivated if you are not satisfied with student work/accomplishment) ○ What about students not showing any real ambition or serious effort in their work, does that affect your supervision? ○ Do you have any examples you could elaborate on?
Self-care: professional support, professional development, life balance, cognitive awareness, and daily balance	● There is sometimes talk about Ph.D. researchers not being able to balance personal life and their studies, from your involvement as a supervisor, have you ever experienced these difficulties? (that is, having supervision time affects your spare time) ○ Do you feel that you learn from supervising and that it gets easier? ○ Have you developed or made use of any strategies or methods to help ease your supervision?

- One last question before we stop, is there anything else you want to add to this discussion?