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Entry

Understanding the Mental Health of Doctoral Students

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Definition: Doctoral degrees include Doctor of Philosophy (PhD) and other professional doctorates such as Engineering Doctorate (EngD), Doctor of Education (EdD) or Doctor of Clinical Psychology (DClinPsy). Unlike undergraduate or postgraduate taught students, doctoral students focus upon a single, autonomous piece of research. Research indicates a high occurrence of mental health problems, mental distress, and symptoms of anxiety or depression in doctoral students. Additionally, there is concern that they may be less likely to disclose existing mental health problems or access support services than undergraduate or postgraduate taught students. This entry explores the known factors that contribute to the mental health of doctoral students studying in the United Kingdom.

Keywords: postgraduate; researcher; doctoral; PhD; mental health; wellbeing; supervision; best practice; university

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1. Introduction

As applicant numbers to higher education institutions in the United Kingdom (UK) reached record highs in 2020, 2021, and 2022 [1], the numbers of young people entering higher education continues to increase. The levels of mental illness, mental distress, and low wellbeing in the UK's higher education sector are high relative to other sections of the population [2]. Therefore, supporting the positive mental health and wellbeing of this growing population is a pressing concern. In response, the UK's higher education sector has undergone substantial strategy development to position student mental health as a core priority [3]. This is demonstrated through the development of the University Mental Health Charter in 2019, advocating a whole-university approach to promoting wellbeing [4,5].

Until recently, most research around student mental health focused on undergraduate students. Yet, recent evidence suggests that depression and anxiety are just as prevalent among doctoral students [6], and psychological distress may be higher [7]. International research indicates a high occurrence of mental health problems, mental distress, and symptoms of anxiety or depression in doctoral students [8–13]. Additionally, there is concern that they may be less likely to disclose existing mental health problems [2] or access support services, believing that they are not entitled to or would not benefit from the provisions available for other students [14]. Research has also identified the stigma that remains around accessing university mental health support, especially for international doctoral students [15].

Concerns about attrition rates in doctoral education have also been addressed in research [16–18]. Although there is a lack of investigation of the determinants of attrition at doctoral level, research is beginning to highlight that mental health problems may predict attendance problems [19]. Doctoral students that experience poor mental health are more likely to be absent during their degree programme [20], discontinue their research [18], or interrupt their studies [19]. A survey of doctoral students studying in the UK indicated that up to a third had considered interrupting their studies due to poor mental health [21]. It is

evident that the working environment of doctoral degrees is implicated in the development or exacerbation of mental health problems [11]. This is of pressing concern to the students personally, and to the wider society [20].

There are significant personal costs of attrition at doctoral level, including limitations to career trajectory and opportunities to succeed in research, and a loss of future leaders in academia. In addition, there are great societal costs of students not completing their research. The work of doctoral students is a major source of scientific advancement and societal benefit in the UK, contributing to the position of the UK as a leader in research and innovation [22]. A loss of productivity, research findings, and innovation in higher education results in a loss of advances in science, health and social care, business, engineering, and technology in the UK, Europe, and beyond [23]. For the doctoral students who continue a career in academia, they become the future educators and supporters of university students. Therefore, investing in their mental health is investing in the experience of future students in higher education.

It is increasingly important that universities have strategies for embedding support for those undertaking doctoral research. In reaction to these concerns being raised by researchers, HE institutions, funders, charities, and the media in the UK have focused on the issue of the mental health and wellbeing of doctoral students. In 2018, Vitae published a report that was funded by the Higher Education Funding Council for England (HEFCE): exploring wellbeing and mental health and associated support services for postgraduate researchers [24]. This report outlined the key issues affecting doctoral students in the UK including supervision, financial concerns, isolation, finances, academic pressures, and workload. It also identified student groups that may be more susceptible to mental health challenges: international researchers, those that study part-time, those with disabilities, and those with family responsibilities. The results from a recent systematic review and meta-analysis also indicate that female doctoral students studying in the UK may be more at risk of poor mental health [25].

As a result of this, Research England and the Office for Students launched a Catalyst Fund call. This provided funding for 17 projects led by research teams within UK universities. This funding was used to explore the mental health and wellbeing of doctoral researchers and begin to implement interventions to negate the challenges they face [26]. Since this rapid increase in research, charities have launched events and resources for universities and doctoral researchers, such as the UK Council for Graduate Education annual international conference: the Mental Health & Wellbeing of Postgraduate Researchers and The Wellbeing Thesis launched by Student Minds [27].

As the higher education sector is increasingly looking for policy and practice initiatives to tackle poor mental health in academia [28], it is important to first establish the scale of the problems and the underlying causes. Since recent research has shed light on the mental health and wellbeing challenges posing doctoral students, there has been a rush to action by universities. Consequently, there is a risk of implementing interventions to tackle the development of mental health problems in the absence of robust prevalence rates or complete understanding of the issue [29]. Currently, the causal factors remain contested, with the literature highlighting a magnitude of complex and intertwined contributing variables.

Therefore, this review focuses on gathering research that has explored the underpinning causes of poor mental health in doctoral students This comprehensive overview of the existing literature will help to identify the gaps in the research and guide the focus of further research. This review focuses on the context of the UK's higher education sector, uncovering and amalgamating the current understanding of the issue. The full methodology is outlined in the Supplementary Materials. This narrative literature review aimed to answer the search question: what are the factors affecting the mental health and wellbeing of doctoral students studying in the UK? This will provide an evidence base to facilitate universities and doctoral schools to support the mental health of doctoral students, and to inform future research.

2. Overview of the Literature

A literature search located 20 relevant papers that explored the factors that contribute to the mental health and wellbeing of doctoral students in the UK. With one exception, most of the research has been published since 2020, in the wake of the catalyst funding and sector-wide focus on the mental health and wellbeing of doctoral students [24]. The body of evidence consists mostly of cross-sectional, survey-based studies that explore a range of contributing factors. Sample sizes of these surveys ranged from 50 to 3352 doctoral students. Most studies included samples from across the UK; others used samples from single institutions. Two studies collected data longitudinally [30,31]. Five studies adopted a fully qualitative approach, and three used mixed methods that combined qualitative and quantitative data. The included studies highlight a diverse range of multi-faceted, intertwined, and complex factors.

The review of the current literature is discussed thematically according to the factors that underpin the mental health of doctoral students. The themes were generated deductively based on the Ecological Systems Theory framework [32]. This theory offers a conceptual framework that structures the influence of each element of an individual's social environment and how individuals respond and react to changes within their environment. Bronfenbrenner's theory divides an individuals' social environment into five layers: the micro-system, the meso-system, the exo-system, the macro-system, and the chrono-system, with the individual at the centre of the model. The micro-system refers to one's immediate social circle, such as family and closest relationships. The meso-system is interconnected, involving peers and colleagues or other social relationships. The exo-system encompasses formal or informal social structures that influence the other layers. The macro-system includes the ideologies of culture, such as geographic locations, ethnicity, or socioeconomic status. Finally, the over-arching chrono-system punctuates existence and interacts continually with the other layers due to environmental factors and social events. The way in which one copes with changes in their wider social environment depends upon the support provided within their individual ecological system.

Individual factors include the personal and psychological factors individuals possess, and how these may predict their susceptibility to mental health problems. These include psychological resources such as personal resilience, self-efficacy, perfectionism, workaholism, and ways of coping. Psychological resources are defined as the mental dispositions or cognitive habits that may increase or hinder wellbeing [33]. A doctoral student's immediate academic community, such as peers and supervisors, were also integral in shaping the postgraduate research experience; social support appears to be a predicting factor of good mental health and wellbeing. Bronfenbrenner [32] described these relationships as an individual's micro-system. Finally, the wider working conditions of higher education and academic culture have been extensively explored within this body of research. This is described as the macro-system [32]: the ideologies of the culture the individual is situated within. This review will provide an overview of this evidence base, critically presenting the literature surrounding individual factors, community, and academic culture and how these interact to shape the mental health of doctoral students.

3. Individual Factors

Many studies explored individual factors that may determine the mental health and wellbeing of doctoral students studying in the UK. These were often investigated within surveys that tested a multitude of factors. Certain psychological resources were found to be strong predictors of poorer mental health outcomes. Firstly, imposter syndrome and low self-belief were commonly explored constructs.

There is strong evidence of the association between imposter thoughts and depression and anxiety, as documented in the Understanding the Mental Health of Doctoral Researchers (U-DOC) survey, the largest study of 3352 UK doctoral students by Berry et al. [20]. The frequency of imposter thoughts was one of the strongest and consistent predictors of mental health symptoms documented in the findings. Similarly, Byrom

et al. [34] concluded that self-depreciation was significantly related to mental wellbeing and perceived stress. Byrom describes self-depreciation as criticism of oneself. These findings highlight a juxtaposition; these highly educated and competent individuals consider themselves to be fraudulent, attributing their success to luck or others. This presents a threat to these individuals' mental health and their ability to reach their full potential. However, identifying mitigations is difficult as the direction of these relationships cannot be deciphered due to cross-sectional methods. It might be that self-depreciation or imposter thoughts could predict poorer mental health, but equally, experiencing poorer mental health may be predictive of the amount of imposter thoughts. Causality cannot be determined from the available evidence to date.

Further survey data document this association, as self-belief has been found to be a key determinant of coping well with the demands of doctoral research [35], and negative appraisals of academic challenges has been found to predict anxiety [31]. The survey conducted by Casey et al. [36] used the scale developed by Juniper et al. [37] to explore the factors underpinning wellbeing in doctoral research. The development of this scale is an important contribution to the body of literature surrounding doctoral mental health as it positions the specific perceptions and experiences of this group at the centre of its construction. The results from this small sample from UK universities revealed that items relating to confidence in one's ability as a researcher and disappointment in one's ability were items reported to have the largest negative impact on wellbeing.

It could be assumed that self-efficacy may play a role in the mental health and wellbeing of doctoral students; however, no researcher has used a validated measure of self-efficacy within this body of research. Themes of self-efficacy and imposter thoughts were also highlighted within qualitative studies, elucidating the relationship between self-belief and mental health outcomes. Worries about one's capability and self-depreciation were prevalent issues discussed by samples of doctoral students in interviews [38] and focus groups [39], with imposter syndrome thought to exacerbate existing wellbeing difficulties [39]. The qualitative research illuminates this emerging concept, positioning this as a worthy topic. Further investigation over longer time periods is warranted to further explore the experience of imposter thoughts and low self-efficacy during doctoral study.

Perfectionism is another maladaptive individual trait that has been hypothesised to be a contributing factor to poor mental health and wellbeing of doctoral students in the UK's higher education sector. Jackman et al. [38] highlighted in their qualitative study how perfectionism can be an unhelpful trait that may amplify perceived pressure during doctoral research, presenting a variety of evocative experiences that resonate with the reader. Two survey-based studies have investigated this variable using regression models, providing robust evidence about the role of maladaptive perfectionism in doctoral student mental health and wellbeing. Measuring perfectionism using the same validated scale (Short Almost Perfect Scale [40]), Milicev et al. [41] and Berry et al. [20] found perfectionism to be a strong predictor of depression, anxiety, and suicidality. These relationships were confirmed in analyses conducted in large samples of 479 and 3352 doctoral students, respectively. However, despite perfectionism being a strong, consistent predictor of mental health outcomes within these studies, cross-sectional evidence cannot be used to assume causality. In addition, Rice et al. [40] discuss the duality of perfectionism, in that perfectionism can be adaptive, and it is important that there is a distinction between adaptive and maladaptive perfectionism in related research.

Alternatively, three studies located in this review explored the psychological resource, resilience, thought to be protective of mental health. Casey et al. [36] identified low resilience in a small sample of doctoral students and triangulated these data with qualitative comments that discuss psychological strength and persevering in times of stress. This crystallization portrays more complexity, providing further understanding of this issue. Milicev et al. [41] investigated resilience using a psychometric scale within a cross-sectional survey, linking personal resilience to several positive psychological outcomes. Higher resilience was predictive of lower anxiety and depression, better sleep and wellbeing, and

reduced suicidal behaviours. More recently, Gooding et al. [31] conducted a longitudinal analysis which supported these findings. Their results indicated that baseline resilience buffered against academic challenges during doctoral research. Doctoral students who reported higher resilience felt more supported socially and experienced less anxiety when experiencing challenges during their research. Although this longitudinal analysis was conducted over a short period, the emerging evidence from these studies suggests that nurturing resilience may be an effective avenue of intervention to support the mental health of doctoral students.

4. Community

Consideration of the wider environment beyond the individual is imperative when investigating a doctoral student's mental health and wellbeing. The experience of these students is shaped by close relationships with those in the communities they are situated in. In addition, vulnerability to stress is related to the quality of these relationships. Several studies have explored the effects of interpersonal relationships within the students' microsystems, as described by Bronfenbrenner [32] as an individual's immediate surroundings. In the context of postgraduate research, this refers to supervisory relationships and connections with peers and research communities. These relationships are thought to be the most influential factors affecting the wellbeing of doctoral students, especially the relationship with their supervisory team.

A large majority of the studies located in this review investigated the extent to which the supervisory relationship affected mental health and wellbeing. Several studies quantified the role the supervisor can play in mental health, namely how the relationship can be preventative of the development of mental health problems or may exacerbate wellbeing issues. Evidence from large sample surveys indicate that poor supervisory relationships or reduced supervisory agency predicted greater absenteeism, attrition intention, depression, and anxiety during doctoral research [19,20,41]. Of all predictive factors, including individual, relational, or social predictors of doctoral students' mental health and wellbeing, supervisory relationship agency was one of the strongest predicting factors identified in the U-DOC study [20].

However, much of the evidence from research conducted in the UK highlights the protective role of the supervisory relationship. Wellbeing has been shown to have been positively affected by these supportive professional relationships [39], associated with lower ratings of stress [34]. Byrom et al. [34] identified many positive ratings of supervisory support, highlighting positive experiences across UK doctoral research programmes. Likewise, respondents from the studies by Casey et al. [36] and Juniper et al. [37] indicated on self-report scales that the supervisory relationship had the least impact on their wellbeing of all factors including social, university, research, and home life.

Qualitative findings illuminate this balance between supervisory relationships that exacerbate wellbeing problems and those that are protective. Qualitative studies investigate the intricacies of these relationships and the importance of balance. Berry et al. [42] highlight the importance of balancing supervisory support and encouraging researcher agency through the analysis of focus group data. White et al. [43] also explore power imbalances in supervisory relationships and the role this may play in the mental health and wellbeing of doctoral students. These findings speak to the complexity of the supervisory relationship, potentially indicating that existing scales, such as the Juniper PhD Wellbeing scale that was utilised by Casey et al. [37] and Juniper et al. [36], may not have been able to capture the more subtle nuances of the relationship and the power dynamics that may interplay with wellbeing. The qualitative explorations of the supervisory experience shed light on this complex relationship, providing clarity to the contradictions. The work presents a concept that can be further questioned and explored in future work.

Despite the contrasting findings about the role of the doctoral supervisor in student wellbeing, there is consensus of the centrality of supervisor support in the doctoral research experience. McCray and Joseph-Richard [35] reported that 71% of doctoral students in the

UK claim that their supervisor is their main source of support. Jackman et al. [44] conducted a person-centred analysis to create student profiles, concluding that high support from supervisors and high identification and belonging, in combination, were related to positive psychological outcomes. Likewise, qualitative evidence highlights the important role supervisors have in facilitating belonging [30] and positive experiences of doctoral research overall [43]. These studies provide thick descriptions of the importance of the supervisory relationship in helping doctoral students to identify with their academic communities.

These findings indicate the role of the supervisor in helping their students to identify with their academic communities. However, the supervisory relationship is just one pillar of a doctoral student's support network during their studies. A student's immediate academic community involves other academics and peers; these relationships also play a role in feelings of belonging. Several studies located in this review address the concept of belonging and its importance to mental health during doctoral research. Existing data indicate that social connection to the immediate academic community is one of the most influential factors affecting the wellbeing [45]. Jackman et al. [44] analysed student profiles that were conducive to high mental wellbeing, surmising that those with high support and high identification to their academic community experienced the most positive psychological outcomes. Likewise, survey data indicate that social support from academic peers reduces stress [20] and negative perceptions of academic challenges [31]. Specifically, relationships with peers appear to be particularly pertinent to wellbeing [39]. Qualitative findings reveal the importance of support from peers and how this may combat isolation [46] and negate loneliness [36] by presenting the emotional experiences of the participants.

Alternatively, qualitative studies have explored feelings of not belonging and the psychological impact this can have [30,39], with doctoral students often reporting feeling like outsiders. Reduced social contact during the COVID-19 pandemic appeared to exacerbate these feelings [47,48], making isolation more of a concern. The U-DOC study (n = 3352) provides robust evidence that feelings of isolation from academic communities is the strongest predictor of mental health symptoms [20] and attrition intentions [19]. Feelings of belonging at university are also related to academic preparedness and satisfaction with the environment.

However, this body of studies, mostly comprising survey data, used a diversity of terms to describe the notion of belonging or not belonging. Terminology ranged from social connection, social support, and social identification to loneliness and isolation. The multitude of terms and lack of consensus of scales used to measure these feelings create a complex picture. There is a strong indication that a sense of belonging within academic communities plays an important role in the mental health and wellbeing of doctoral students; however, this requires further exploration using standardized measures. Currently, it is difficult to collate or amalgamate the evidence due to this disparity. Further in-depth descriptions of the experiences of loneliness during doctoral study would provide a significant contribution and expand understanding.

5. Academic Culture

The final layer of the Ecological Systems Theory [32] is the macro-system. This refers to the outer layer of the doctoral research context, which encapsulates the wider culture and attitudes of academia within the UK and how this permeates the other layers within the system. This describes the environment that the doctoral student is active within and the norms that they may internalize.

The existing literature highlights systemic issues of overwork and workaholism in doctoral research due to the pressures of academia. Milicev et al. [41] provide robust evidence from regression analyses that workaholism predicts anxiety, depression, poor sleep, poor wellbeing, and suicidal behaviours in doctoral students. Self-reported workaholism was a predictor of more adverse mental health outcomes than any other variable. Qualitative studies further elucidate these findings, explaining how there is guilt associated with

dedicating time to self-care or activities that may promote wellbeing due to the perceived pressure of academic work [36,38,43]. This research is timely, illuminating the experience of those situated within this culture of over-work. However, it is important to consider that these studies were likely undertaken in the COVID-19 period, where stressors were exacerbated by homeworking during lockdowns. This likely affected students' perceptions of work–life balance [47].

Results from the U-DOC study raised concerns about how struggles with mental wellbeing were normalized within peer groups and academic communities [21]. Qualitative comments reported by Casey et al. [36] suggest how this perception may be perpetuated by social media, presenting compelling insights. Survey-based research located in this review also revealed a reluctance to seek mental health support in doctoral students [35] and low mental health literacy, exacerbating psychological distress [7].

In their analysis of suicidal ideation within the U-DOC cohort, Hazell et al. [49] revealed a reticence to discuss suicidal thoughts within universities, despite the quantitative findings indicating that 20–35% of doctoral students may be at risk of suicide. However, the researchers identify how self-selection bias may contribute to an overestimation of psychological distress in this sample [21]. Additionally, it could be likely that the participants may have been primed to discuss suicidal ideation within the free-text comments due to the content of the suicidal behaviour scale.

Several studies that have explored the underpinning of mental health and wellbeing in doctoral students have identified inequalities in academia and how these may contribute. For example, a survey by Crook et al. [39] that included a large sample identified that doctoral students from a low childhood socioeconomic status and those who have a disability had significantly lower wellbeing and anxiety scores than their counterparts, highlighting the predictive role of intersectionality in mental health. Likewise, the U-DOC study data reported that absenteeism, interrupting studies due to mental health, and attrition due to mental health were significantly associated with having a disability [19].

Data from qualitative studies expand these findings. Nuanced accounts from doctoral students describe the experience of minoritized groups within non-diverse academic environments, exacerbating feelings of being an outsider [30]. This qualitative research provides evocative narratives from under-represented PGRs. Qualitative survey responses revealed how current systems did not adapt well to those with diverse needs [43], highlighting the elitist aspects of academia. These issues also came to the fore within the study by The Student Mental Health Research Network that focused on the experiences of doctoral students during the first COVID-19 lockdown in the UK [47,48]. Those with caring responsibilities reported falling behind and being less able to access career-enhancing opportunities [47]. On the other hand, digital advances during this period were said to have made it easier for individuals with certain disabilities to engage flexibly and equitably with their academic communities [47].

Further longitudinal research is warranted to understand the unique experiences of doctoral students from diverse or under-represented groups, especially BAME groups, that have been less represented in this body of research. There is a need for more investigations of the specific challenges faced by these individuals including integrating into their academic community, financial pressures, prejudice, or discrimination. Qualitative research would likely provide significant contributions. The findings discussed here should be further explored post-COVID to understand which factors remain pertinent.

6. Discussion

The results of this narrative review were discussed thematically within the Ecological Systems Framework [32], addressing the individual factors, the micro-system (a doctoral student's immediate community), and the macro-system (the wider academic culture in the UK) and how these layers of one's social environment interact. The theory provides a conceptual tool that has been embedded in mental health policy, practice, and interventions, helping to understand doctoral mental health from the social perspective. It offers a way

to simultaneously focus on individual behaviours, personal attributes and environmental factors and the dynamic interplay between them. The results critically present how these diverse and complex factors intersect to shape the mental health and wellbeing of doctoral students.

Firstly, addressing individual factors, several studies identified in this review investigated the role of one's own psychological resources and how these underpin mental wellbeing during doctoral research. Imposter thoughts, self-depreciation, and maladaptive perfectionism had several measurable negative impacts on mental health [20,34,41]. The qualitative findings presented in this review begin to identify self-belief as a potential protective factor. However, the concept of self-efficacy in doctoral research has yet to be measured by UK research teams using a validated scale. Despite this, there is robust research conducted in Australian doctoral students that confirms self-efficacy as a contributing factor to mental health [50].

Byrom et al. [34] proposed that increased support from peers has the potential to negate feelings of self-depreciation and imposter syndrome [34], increasing self-efficacy. However, due to the solitary nature of postgraduate research, there are few opportunities to validate and verify one's performance with peers and to normalize academic challenges or failures [31,36]. It is important that universities and doctoral schools provide opportunities for doctoral students to discuss overcoming failure and celebrating success with their peers and academic communities to negate imposter feelings and foster self-belief. These findings emphasize the need for educational policies that encourage stimulating and inclusive research environments.

More recently, the concept of resilience has been measured in doctoral students in the UK [31,36,41]. Resilience is understood to be an important determinant of wellbeing [51]. A recent literature review highlighted the role that resilience can play in good mental health, coping and success at university [52]. Therefore, interest in resilience in student groups is increasing, with many interventions focusing on promoting resilience [53]. Promoting this capacity to cope and react adaptively when facing adversity may be an avenue for intervention for supporting the mental health of doctoral students. To date, no research conducted in the UK has analysed or measured ways of coping with psychometric scales and how these may interplay with resilience. Exploration of resilience and theories of coping within the doctoral research context offers an opportunity for further research. However, due to the complex effects each level of the ecological system has on a doctoral student's mental health and wellbeing, it can be assumed that targeting only individual factors is unlikely to be successful.

Beyond the individual factors, many studies explored the relationships within a doctoral student's micro-system that contribute to mental health and wellbeing. Firstly, supervisory relationships appear to be the most influential on mental health and wellbeing, as confirmed by previous reviews [54,55]. Interactions with academic supervisors shape the experiences of doctoral researchers and their supervisors are frequently identified as the central source of support. This body of evidence identified the supervisor relationship as one of the strongest predictors mental health and wellbeing in doctoral students [20], supporting previous international research [11]. However, the findings within the UK's doctoral research context mostly reported positive experiences [34,36,39,46], indicating many examples of good practice. This may reflect the advances in the institutional training of doctoral research supervisors in the UK, driven by the roll-out of the UK Council of Graduate Education Good Supervisory Practice Framework [56]. The framework provides advice, desired competencies, and training, encompassing psychosocial support beyond academic guidance. This framework offers a ready-made, effective, and nationally recognized resource that may be utilized in practice or research.

Despite the research indicating positive experiences with supervision in the UK, the supervisor relationship is an essential element to address within a multi-level approach to doctoral mental health and wellbeing. There is robust evidence that poor supervisory relationships can have significant adverse psychological outcomes [20] and contribute to

attrition intentions [19]. It is important to consider that the cross-sectional research reported here has not included those who have left their doctoral programmes. As attrition intention is documented to be associated with poor supervision, it may be that those with adverse experience have not been captured within the existing evidence. Scope remains for research that focuses on those who failed to complete their research, investigating the most pertinent causes of attrition. Research teams or doctoral colleges that seek to evaluate or improve supervisory practice must consider workload for academics. The ability of the supervisor to engage with initiatives is limited by perceived capacity, so it is imperative to acknowledge the pressures of academic workload and the pinch points in the academic year.

Within a doctoral student's micro-system, connections to peers and belonging to the immediate academic community have been highlighted as important predictors of wellbeing [44,45]. Although conceptualizations and definitions of belonging, social connection, or social identification have varied in the literature, UK research has identified how isolation from the academic community is a risk factor for poor mental health outcomes [20,24]. Stronger identification with peers is related to positive psychological outcomes [44], and buffers negative mental health outcomes [34]. Therefore, increasing peer contact and peer networks may be effective in promoting wellbeing. However, how much one can capitalize on the benefits of social support relies on an individual's ability to recognize their own psychological distress and seek social support.

Several authors make recommendations around developing supportive networks involving peers to promote mental health and wellbeing during doctoral research programmes [31,36,39,44]. In addition, it is important to consider the potential risks of asking a group of individuals who are at heightened risk of experiencing or developing mental health problems [21] to support the mental health of others [44]. This could have perilous consequences if poorly managed. Additionally, it is important to consider that not all students have equal access to peer support and face further barriers, such as part-time students, international students, those working remotely, those with chronic illnesses or disabilities, and those with caring responsibilities [44,57]. It is imperative that opportunities to engage with peers within an institution's doctoral research culture are equally accessible to all students.

Finally, research included in this review also explored the wider systemic factors: the macro-system. Data from the UK suggest that the average doctoral student works 47 h per week. This is over 50% more than the average undergraduate student [58], leading to conflicts between work and personal time [24]. International research provides evidence that greater weekly hours worked is a significant predictor of depression symptoms in doctoral students [59]. Working excessive hours during doctoral research has also been associated with poorer wellbeing [60] and psychological distress [11].

These norms and expectations seep into the other layers of the ecological system. Exposure to this culture can trigger imposter feelings and discourage help-seeking behaviours [24]. The pressures faced by academics in terms of pressure to publish, high workload, and unfavourable work–life balance could filter down the hierarchy [61]. This can be experienced more acutely by those from diverse groups within non-diverse academic environments [43]. The findings of this review highlight the heterogeneity of the doctoral research experience in the UK, and the need to foster inclusive communities where all members receive equitable treatment. The culture of high achievement and long working hours in academia should continue to be challenged [24]. For those considering interventions that target individual factors, this context should not be ignored; these wider cultural influences and how they interact with the other levels must be considered.

It is important to discuss the limitations of the current research evidence gathered in this review. Much of the research that has been conducted uses cross-sectional methodology conducted at one time-point, revealing a snapshot in time. This limits the ability to draw conclusions of the directions of the relationships established and limits causal interpretations about the factors affecting mental health and wellbeing. Further longitudinal data collection is warranted, following the same sample across their doctoral research degree.

A longitudinal design with longer periods is needed to better understand the direction of relationships and could establish pinch points during the research journey. This is especially important as some research within this body of evidence focused on the early stages of postgraduate research only [38]. Continued robust data collection using validated measures across several timepoints would provide valuable insights. This would allow for researchers to assess the variation in mental health across time and appropriately direct further research and interventions. Further, the use of scales constructed to assess the specific factors relating to doctoral student mental health is advocated [37]. The creation of scales specific to the doctoral experience provide new insights that may guide more effective support for these students.

As many of the authors discussed within their publications, self-selection bias is an issue with the use of convenience sampling. None of the included studies used random sampling methods but recruited self-selecting samples. This creates explicit issues in studies about mental health and wellbeing, as this creates the tendency to disproportionately attract those concerned about mental health problems, and those experiencing poor wellbeing at the time are likely more motivated to take part. Specifically, those that participated in the included surveys tended to score highly on several clinical measures of distress or mental health symptomology. Many of the studies report alarmingly high prevalence rates of mental health problems, far exceeding sector data. However, it is important to consider that the non-clinical scales used, although validated and considered reliable, do not equate to a clinical diagnosis of mental health. This is to be considered, especially when researchers have used shorted versions of the scales to reduce participant burden. However, it is understood that disclosure of mental health problems is a pertinent concern [2]. It is surmised that an overestimation of distress in these self-selecting samples may have elevated the prevalence rates [7].

This is also a limitation of studies that collected qualitative data, either via open-ended survey questions or interviews and focus groups. The questions that are asked within the scales measuring psychological distress, anxiety, or suicidal thoughts may prime participants' further responses to focus on adverse psychological experiences. Likewise, with interviews and focus groups, recruitment advertisements that mention mental health and wellbeing may elicit discussions of poor mental health and suicidal behaviour [49]. Using more neutral terminology within recruitment posters, participant information, and survey wording may be a way to negate this priming bias. The use of scales with more neutral terminology, such as the Warwick Edinburgh Mental Wellbeing Scale [62], may be a way to assess the likelihood of an individual developing a mental health problem, without explicitly asking them about pathological symptomology.

One key issue identified in this body of work is the over representation of females in the samples, as many of the research teams highlighted. This is of particular importance as females tend to have poorer mental health while at university; suicidal ideation and mental health problems are more prevalent in young females [63]. It is imperative to consider how this may have skewed the findings. Although understanding the female experience is important, especially in the wake of the pandemic where female academics' work was more adversely affected [64], efforts should be made by researchers to engage more male participants, and those who do not identify as male or female, to create a balanced view. It could be argued that, due to the mental health connotations, more females were inclined to take part. This may be another explanation for the inflation of mental health prevalence in this body of data.

Despite the inequalities in doctoral research being alluded to within this body of evidence, it was acknowledged by several research groups that their surveys garnered responses from mostly white, domestic students. Those from Black, Asian and minority ethnic groups and those who were not UK citizens were under-represented in the located research [7,34,39,44]. This may speak to under-representation in wider academia and is a concern, as voices that are seldom heard may not have been reflected within this review. As experiences are culturally bound, researchers need to address this imbalance and must make

considered efforts to engage with these groups and understand their unique challenges. In intervention or policy development, co-production with doctoral researchers from under-represented cultural groups will add significant value and relevance [7,39]. Wider than the UK context, it is essential that transcultural studies are developed to understand different educational settings and how this intersects with mental health, especially considering the internationalization of higher education. Landmark studies conducted in Europe and internationally have also identified poor mental health across doctoral students [11,12], highlighting the magnitude of the issue cross-culturally.

7. Conclusions

This review presents several recommendations for universities, doctoral colleges, and supervisors to support the mental health of doctoral students, and suggestions for future research directions. Although there has been an evident, rapid increase in research in this field, further understanding into the specific experience of doctoral students in the UK is imperative to inform remedial strategies. There remains the risk of implementing strategies or directing funding that may be ineffective without a more detailed understanding of the complex, nuanced, and multi-faceted issues underpinning the mental health and wellbeing of doctoral students. In this body of research, self-selecting convenience samples introduced several biases. Work that recruits larger, random samples of doctoral students is vital. There are opportunities that could be forged between research teams and university counselling services to implement a large-scale data collection of consistent, longitudinal data [29]. Collaborations of this kind could reap many benefits for practice and research, working towards a strong evidence base to further understand how best to support doctoral students and to direct funding, training, and resources most appropriately and effectively [3].

As well as large, robust, continuous data sets, there remains a need for further qualitative exploration. Survey-based studies, even when collecting qualitative data, are limited as they are unable to probe for clarification or further detail. There are potentials and limitations to both methodological approaches and they effectively contribute to the body of evidence. However, when quantitative findings are contested, or causal factors are unclear, qualitative data allow for rich descriptions, further interpretation, and evocative narratives that resonate with readers. Future exploration of the known factors that affect the mental health and wellbeing of doctoral students will be useful to further understand the complex, nuanced, and emotional experience.

Co-production presents an opportunity to use the voices of doctoral students to guide further research. To involve students, especially those who have not been represented within this body of evidence, in the creation of future research and interventions has many likely benefits. It is important to involve those from every stage of study and from every demographic group. Understanding of minority groups or those with chronic illnesses and disabilities is imperative, especially as these individuals may be at higher risk of compromised mental health at university. The heterogeneity of doctoral students, particularly in comparison to undergraduate student bodies, must be recognised to support the unique needs across spectrums. Institutions need to embrace the diversity of experiences and personal circumstances; a one size fits all approach to supporting doctoral students is unlikely to be effective.

The aim of this literature review was to critically present the range of known factors that affect the mental health and wellbeing of doctoral students in the UK. The findings display a range of complex, intertwined influencing factors. The multitude of factors identified within different layers of a doctoral student's social context makes it difficult to separate them and identify which are more salient. It is recommended, therefore, that potential interventions should target multiple levels, not just the individual, but their immediate social circles and wider communities.

Initiatives should be designed to focus simultaneously on multiple ecological systems to support doctoral mental health [38]. Further research should investigate the ways in which these individual, community, and institutional factors interact, and consider ways to

target multiple layers. For instance, if an intervention were to focus on promoting resilience or supporting a healthy work–life balance, it could be carried out in group settings to also improve social support and feelings of belonging. In addition, there needs to be an emphasis on the wider systems to which the doctoral student belongs, beyond the discourse of personal deficits of psychological resources. Interventions that solely focus on the individual to change their behaviour will not permeate the other layers of the social environment that contribute to poorer mental health and wellbeing.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/encyclopedia3040109/s1. Refs. [65–68] are cited in Supplementary Materials.

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