An Exploration of Imposter Phenomenon Amongst Doctoral Students

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Abstract

Aim: This thesis aims to explore (a) maladaptive associations of Imposter Phenomenon (IP) in doctoral and PhD students, and (b) quantitatively investigate the relationship between IP, perfectionism, and psychological wellbeing in trainee clinical psychologists.

Design: The portfolio comprises of the following sections: (a) an introduction to the content of the thesis, (b) a systematic review examining maladaptive associations of IP in doctoral and PhD students using a narrative synthesis approach, (c) a bridging chapter outlining maladaptive associations of IP and its relevance to UK trainee clinical psychologists, (d) an empirical paper investigating the relationship between IP, perfectionism, and wellbeing in UK trainee clinical psychologists, and (e) a concluding discussion and critical evaluation.

Results: The systematic review identified consistent associations between IP and psychological distress, including depression and anxiety, alongside links with perfectionism and low self-esteem. Relational and contextual factors, such as supervisory relationships and academic climate, were also associated. The empirical study demonstrated significant positive associations between IP, perfectionist cognitions, and symptoms of depression and anxiety in trainee clinical psychologists. Perfectionist cognitions independently predicted depressive symptoms once imposter feelings were accounted for, whereas both constructs were associated with anxiety. Moderation analyses did not support an interaction effect between perfectionist cognitions and IP.

Conclusion: Overall, the findings indicate that IP in doctoral-level contexts is associated with psychological distress within a broader cognitive and contextual framework. While perfectionistic thinking appears particularly salient to depressive symptoms in trainee clinical psychologists, the systematic review also highlights the wider influence of relational and academic environments in the development and maintenance of imposter experiences. This portfolio advances a more integrated understanding of IP within advanced academic and professional training and informs directions for future research.

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Chapter One – Thesis Portfolio Introduction

This chapter offers an introduction to the thesis portfolio, firstly outlining literature regarding the current understanding of Imposter Phenomenon (IP), before discussing its relevance at doctoral level education and in related settings. The rationale for the current portfolio is outlined, followed by a description of its structure.

What is Imposter Phenomenon?

Imposter Phenomenon (IP) was first described by Clance and Imes (1978), who observed that a group of high-achieving women reported persistently doubting their intellectual ability, despite clear academic and professional success. The women characterised this experience as a chronic sense of being intellectually fraudulent, accompanied by fears of being exposed as less competent than others believed them to be. Clance and Imes intentionally described this experience as a phenomenon, reflecting a pattern of psychological experiences observed within clinical practice rather than proposing a recognised psychiatric disorder or diagnostic syndrome. Early explanations for these experiences emphasised gendered socialisation and attributional patterns, with individuals tending to attribute success to external factors such as luck, whilst internalising perceived failures (Clance, 1985; Harvey & Katz, 1985; Langford & Clance, 1993).

Although the terms Imposter Phenomenon and Imposter Syndrome are now frequently used interchangeably within public discourse, the term Imposter Phenomenon is adopted throughout this thesis. Whilst Imposter Syndrome has become increasingly common within popular language, the experience is not recognised as a formal psychiatric disorder or clinical syndrome (Bravata et al., 2020). Consequently, a number of contemporary authors continue to favour the term phenomenon, as it more accurately reflects the original conceptualisation proposed by Clance and Imes (1978) and avoids implying the existence of a recognised diagnostic condition (Montgomery & Gerhardt 2025). Throughout this thesis, the term IP is therefore used to remain consistent with the original conceptualisation and current academic convention.

Over subsequent decades, research expanded considerably beyond the initial gendered conceptualisation of IP. Imposter experiences have now been documented across genders, ethnicities, professions and student groups (Bravata et al., 2020), suggesting that they are

not confined to a particular population but may instead emerge within contexts characterised by high expectations, achievement and evaluative scrutiny. This expansion of the literature has also been accompanied by increasing diversification in both the populations studied and the theoretical perspectives adopted to explain imposter experiences. However, despite this substantial growth in the literature, there remains comparatively limited consensus regarding how IP should best be conceptualised.

Whilst many researchers continue to conceptualise IP as a relatively discrete psychological construct characterised by persistent feelings of fraudulence despite objective evidence of competence, alternative perspectives have proposed broader conceptualisations. For example, Kolligian and Sternberg (1991) argued that the construct may be more accurately understood as perceived fraudulence, emphasising broader patterns of self-perception and self-presentation rather than a distinct syndrome. Similarly, Leary et al. (2000) suggested that imposter experiences may reflect self-presentational concerns, whereby individuals fear that others hold unrealistically favourable impressions of their abilities. More recently, Slank (2019) proposed that imposter experiences may also be understood through beliefs regarding deservedness, talent and self-worth, challenging the assumption that individuals experiencing IP simply underestimate their competence. Collectively, these perspectives suggest that IP may encompass multiple interacting psychological processes rather than representing a single construct.

The conceptual complexity of IP is further reflected in its relationship with a number of related psychological constructs. Research has consistently demonstrated associations between IP and perfectionism, low self-esteem, anxiety and depression (Bravata et al., 2020; Sakulku & Alexander, 2011). However, the nature of these relationships remains uncertain. Perfectionism shares several features with IP, including heightened concern over mistakes, fear of failure and difficulties internalising success (Grubb & Grubb, 2021; Thompson et al., 1998), whilst low self-esteem similarly involves negative self-evaluation and reduced confidence in one's own abilities. Consequently, it remains unclear whether these constructs represent distinct psychological phenomena, overlapping vulnerability factors, or different manifestations of broader self-evaluative processes. As highlighted by Sakulku and Alexander (2011), this conceptual ambiguity presents challenges for both

research and clinical understanding, contributing to ongoing inconsistency in how IP is defined, measured and interpreted across studies.

Contemporary accounts increasingly conceptualise IP less as a fixed personality trait and more as a dynamic self-evaluative experience shaped through interactions between individual cognitive processes and environmental contexts (Leary et al., 2000). This evolving perspective suggests that understanding imposter experiences requires consideration of both individual psychological processes and the educational, professional and social environments within which they occur. Furthermore, increasing discussion within the literature suggests that experiences of self-doubt should not necessarily be viewed as uniformly maladaptive (Rilveria, 2026). Rather, distinguishing adaptive self-evaluative uncertainty that accompanies learning and professional development from persistent and distressing imposter experiences may represent an important conceptual challenge for future research.

Accordingly, the present thesis adopts the position that IP should be understood as a conceptually complex construct with potentially overlapping boundaries to broader self-evaluative processes. Rather than attempting to resolve these conceptual debates definitively, this portfolio seeks to contribute towards a more nuanced understanding of maladaptive imposter experiences within doctoral education, including their relationship with perfectionism, psychological wellbeing and broader self-evaluative processes.

Imposter Phenomenon in doctoral contexts

Doctoral training represents a period of high academic and professional development in which identity, competence and professional legitimacy are continually shaped and tested. Unlike earlier stages of education, doctoral study is characterised by sustained independent working, evolving expectations and frequent exposure to both formal and informal evaluation, alongside the expectation of producing original contributions to knowledge. Research has consistently highlighted the psychological demands associated with this stage of training, including elevated stress and increased vulnerability to mental health difficulties (Schmidt & Hansson, 2018; Evans et al., 2018).

Beyond workload, doctoral education also represents a period of continued competency development. As individuals progress through doctoral training, they are expected to

develop increasing autonomy whilst continually evaluating their own developing knowledge, clinical or research skills, and professional judgement. Gardner (2008) highlighted that doctoral students must learn to accurately judge when to seek guidance and when to demonstrate independence, requiring ongoing self-evaluation throughout training. Consequently, experiences of uncertainty regarding one's competence may represent an expected aspect of progressing towards expertise, rather than necessarily indicating inadequate ability.

This distinction is particularly relevant when considering IP within doctoral populations. Whilst persistent and pervasive self-doubt is recognised as a defining feature of maladaptive imposter experiences, emerging literature suggests that experiences of self-doubt are not inherently maladaptive and may, in some circumstances, facilitate reflective practice, openness to feedback and continued professional development (Rilveria, 2026; Smith et al., 2014). Within demanding educational environments, uncertainty regarding one's developing competence may therefore represent a normative response to increasing expectations and complexity, rather than evidence of intellectual inadequacy.

Conversely, when self-doubt becomes persistent, resistant to objective evidence of competence, and characterised by enduring fears of intellectual or professional fraudulence, it may become maladaptive. Rather than supporting learning and development, these experiences may contribute to heightened psychological distress, avoidance behaviours and reduced psychological wellbeing (Duru et al., 2023). Distinguishing adaptive self-evaluative uncertainty from maladaptive imposter experiences therefore represents an important conceptual challenge, both for understanding IP itself and for determining when experiences of self-doubt may warrant additional support. This perspective also aligns with growing recognition that imposter experiences should be understood within the educational and professional environments in which they occur, rather than solely as characteristics of the individual (Ménard et al., 2023; Franchi & Russell-Sewell, 2023).

Moreover, doctoral education provides a particularly valuable context within which to investigate IP. The combination of sustained evaluation, increasing autonomy, evolving professional identity and ongoing competency development creates an environment in which adaptive and maladaptive experiences of self-doubt may coexist. Understanding

how these experiences relate to psychological wellbeing, perfectionism and broader self-evaluative processes may therefore contribute not only to improving support for doctoral students, but also to advancing theoretical understanding of IP more broadly.

Literature gaps and portfolio rationale

The growing body of research examining IP has considerably advanced understanding of the construct and its associations with psychological wellbeing and functioning beyond its original gendered stereotypes. However, as outlined above, important conceptual and methodological questions remain unresolved. In particular, uncertainty persists regarding the conceptualisation of IP, its relationship with broader self-evaluative processes and the extent to which adaptive and maladaptive imposter experiences can be meaningfully distinguished (Sakulku & Alexander, 2011). Addressing these questions is important not only for advancing theoretical understanding of IP, but also for informing how higher education institutions and professional training programmes understand and respond to experiences of self-doubt amongst doctoral students. Consequently, there is a need for research that both synthesises the existing evidence within doctoral populations and further explores psychological processes that may underpin maladaptive imposter experiences.

There has been a significant increase in the quantity of research on IP over the past five years, with existing studies identifying associations between IP and psychological distress (Al Lawati et al., 2025). However, much of the literature relies upon cross-sectional designs and broad student samples, with comparatively limited synthesis of findings specific to doctoral or PhD-level training. The vast majority of research considering IP in student groups focuses on, or incorporates, undergraduate or Master's students (Ménard & Chittle, 2023), or medical students (Chua et al., 2025), who do not typically undertake the same requirements of original research or professional placements found within professional doctorate or PhD qualifications. Furthermore, doctoral education itself represents a heterogeneous context, encompassing research PhDs, professional doctorates and programmes with differing purposes, structures and expectations. Whilst these groups share common experiences of advanced academic training, this diversity should be acknowledged when interpreting findings across doctoral populations.

Alongside the need to better understand the prevalence and correlates of IP within doctoral populations, further investigation is also required into the psychological processes that may underpin or maintain maladaptive imposter experiences. Perfectionism has been closely associated with IP across research, with Grubb and Grubb (2021) noting shared elements of concern over mistakes and Thompson et al. (1998) identifying common tendencies to externalise success. Similarly, within student populations, both perfectionism and IP have independently been associated with poorer psychological wellbeing (Madigan, 2019; Rnic et al., 2021; Qasem et al., 2025). Given the conceptual overlap between IP, perfectionism and broader self-evaluative processes discussed previously, further exploration of these relationships may help clarify the mechanisms through which maladaptive imposter experiences develop and contribute to psychological distress. Exploring the relationship between imposter experiences and perfectionism within doctoral environments may therefore offer greater insight into vulnerability to distress and inform approaches towards doctoral student support.

Accordingly, this portfolio addresses these gaps through two complementary studies. The systematic review synthesises the literature examining the maladaptive associations of IP within doctoral and PhD populations, whilst the empirical study investigates the relationships between IP, perfectionist cognitions and psychological wellbeing in UK doctoral Trainee Clinical Psychologists (TCPs). Together, these studies aim to advance understanding of maladaptive imposter experiences within doctoral education whilst contributing towards broader discussion regarding IP and its relationship with associated psychological processes.

Thesis portfolio outline

This thesis portfolio has been designed to progressively develop understanding of IP within doctoral education. Building upon the conceptual issues introduced in this chapter, the portfolio moves from synthesis of the existing literature, to empirical investigation, before concluding with a critical evaluation of the findings and their implications for theory, research and clinical psychology training.

The following chapter presents a systematic review examining the maladaptive associations of IP amongst doctoral and PhD students. Given the conceptual complexity surrounding IP identified within this introduction, the review aims not only to synthesise the existing literature, but also to consider the consistency of findings across different doctoral populations and identify areas requiring further investigation. The introduction outlines a brief theoretical conceptualisation of IP and overview of doctoral and PhD student challenges, followed by a narrative synthesis of maladaptive associations of IP within this population.

A bridging chapter briefly outlines the findings of the systematic review and their relevance to UK doctoral TCPs, providing the rationale for the subsequent empirical investigation. Chapter Four reports on a quantitative study exploring the relationships between IP, perfectionist cognitions and psychological wellbeing in UK TCPs during doctoral training. Building upon the conceptual framework outlined within this introduction, the empirical study explores whether perfectionist cognitions may represent one psychological process through which maladaptive imposter experiences are associated with psychological wellbeing.

The portfolio concludes with a critical evaluation and discussion of the findings, considering the strengths and limitations of both studies together with their implications for the conceptualisation of IP, future research, applications to clinical psychology training and wider approaches to supporting doctoral students.

Chapter Two – Systematic Review

Maladaptive associations of Imposter Phenomenon amongst doctoral/PhD students: A narrative analysis.

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(Author guidelines for manuscript preparation – Appendix A)

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Abstract

Introduction: Imposter Phenomenon (IP) is widely reported among high-achieving groups, yet its role in doctoral and PhD training remains insufficiently synthesised. Doctoral education involves prolonged uncertainty, evaluative pressure, and professional identity development, which may heighten vulnerability to imposter experiences. This study aimed to conduct a review of the literature to explore maladaptive associations of IP in doctoral populations.

Method: Twenty empirical studies investigating IP among doctoral/PhD students across multiple countries and disciplines were included following systematic database searches. A quality appraisal using the Mixed Methods Appraisal Tool (MMAT) was completed and a narrative synthesis was conducted.

Results: IP was highly prevalent, with many doctoral students reporting frequent or intense imposter feelings. Across studies, IP was consistently associated with psychological distress, including depression, anxiety, stress, suicidality, emotional exhaustion, and reduced wellbeing. It was also linked to a self-critical, internalising profile characterised by perfectionism, low self-esteem, reduced self-compassion and self-efficacy, rumination, and avoidance. Academically, IP was associated with reduced research confidence, increased procrastination, withdrawal intentions, and poorer perceived performance. Social and institutional factors, including supervisory relationships and belonging, were also implicated.

Discussion: IP appears to represent a meaningful vulnerability within doctoral education, associated with both psychological distress and impaired academic functioning. However, the predominance of cross-sectional self-report designs limits causal inference. Longitudinal and theoretically informed research is needed to clarify mechanisms and guide institutional strategies to support doctoral wellbeing and retention

Keywords: Imposter Phenomenon, Maladaptive factors, Doctoral, PhD, Student, Narrative analysis

1. Introduction

1.1 Conceptualisation of Imposter Phenomenon

Imposter Phenomenon (IP), also known as imposter syndrome, is typically defined as the psychological experience of believing that one's own accomplishments have not been achieved through genuine ability or competence, but rather through external or unrelated factors (Langford and Clance, 1993). As a result, individuals with high levels of IP report a sense of intellectual fraudulence, characterised by self-doubt, a fear of being found out and an inability to internalise personal successes (Clance, 1985). IP was first characterised by Clance and Imes (1978), who observed IP in successful females within higher education and professional work settings. Their research found IP to be most prevalent in females who attributed their success to come from personal charm and their ability to read others, rather than actual intellectual prowess.

As discussed by Clance and Imes (1978), individuals experiencing IP often maintain the belief that they have deceived others into overestimating their abilities, and fear that they are at continual risk of being found out as inadequate or undeserving of their achievements. This internal conviction may persist even in the face of clear success, qualifications, or positive evaluations, marking imposter feelings as a complex interaction of cognitive and emotional factors, rather than a logical appraisal of ability. Although IP is not recognised as a formal mental health condition or diagnosis, it is associated with a range of distressing psychological experiences including increased anxiety, fear of failure, emotional exhaustion, and reduced wellbeing (Thompson et al., 1998).

A failure to internalise success is a central feature of IP, as rather than attributing performance to ability or effort, individuals commonly ascribe accomplishments to external or unstable factors such as luck, timing, or interpersonal charm (Clance and Imes, 1978; Harvey and Katz, 1985). For example, Thompson et al. (1998) studied undergraduate Psychology students and found those with higher imposterism scores to be significantly more likely to attribute their success to external factors, as measured by the causal dimension scale (Russell, 1982). This attribution style might contribute to an ongoing pattern whereby success triggers anxiety, over-preparation or avoidance, and

subsequent discounting of positive outcomes. As a result, the individual's self-doubt remains intact, and the cycle of imposterism may become self-reinforcing (Clance, 1985).

Building on initial concepts, researchers have explored IP as a multidimensional experience incorporating elements of self-doubt, perfectionistic self-criticism, achievement-related anxiety, and emotional dysregulation (Kolligian and Sternberg, 1991; Langford and Clance, 1993). Perfectionistic tendencies centred on the discrepancy between personal standards and perceived performance are frequently implicated in the development and maintenance of imposter feelings (Pannhausen et al., 2022), as individuals may hold unrealistically high expectations for themselves and interpret even minor shortcomings as evidence of incompetence, contributing to chronic feelings of inadequacy.

Another core aspect of IP concerns social evaluation and belonging. Many individuals experiencing imposterism report heightened sensitivity to the judgements of others, increased self-monitoring, and a sense of not fitting the perceived profile of a competent or successful person (Leary et al., 2000). This can manifest as persistent comparison with peers, minimisation of personal strengths, and difficulty accepting praise or recognition (Leary and Downs, 1995; Fassl et al., 2020). Feelings of not belonging or being different from one's academic, professional, or social group may further amplify imposter cognitions.

Overall, IP is best understood as a complex interaction of psychological, cognitive, emotional, and interpersonal processes, marked by persistent self-doubt, distorted attributions for success, perfectionistic concerns, and insecurity about social or professional legitimacy (Clance, 1985; Leary et al., 2000). These core characteristics provide a foundation for exploring how imposter feelings manifest and operate within specific populations.

Research regarding IP has seen a steep rise over recent years. The 'Web of Science' online database reports 138 papers in response to the term 'impostor phenomenon' between 1978-2019, with a further 416 papers meeting the same search result between the years 2020-2025. This rise suggests a significant increase of interest and willingness by academics to understand and address problems exacerbated by IP.

1.2 Doctoral/PhD study challenges

Doctoral/PhD level training represents one of the most demanding and complex forms of academic study, characterised by prolonged uncertainty, high expectations, and substantial intellectual and emotional labour (Schmidt and Hansson, 2018). Research consistently shows that the doctoral journey involves negotiating multiple roles, managing shifting academic pressures and coping with evolving performance standards (McAlpine and Norton, 2006; Gardner, 2008). Unlike purely taught programmes, doctoral level research requires extended periods of independent work, self-direction, and the capacity to generate original contributions to research knowledge. These tasks inherently involve frequent evaluation and judgement from supervisors, peers and experts within study disciplines (Golde, 2005; Lovitts, 2001).

For the purposes of this review, doctoral study refers to PhD and other doctoral-level programmes involving a substantial independent research component and progression towards an original contribution to knowledge. This encompasses both research-focused PhDs and professional doctorates, although the structure, purpose and balance of research and professional training may differ between programmes.

Doctoral researchers may routinely encounter situations where feedback may be brief or limited, goals may be vaguely defined and the criteria for success might be harder to achieve than previous educational pursuits (Stubb et al., 2011; Pyhältö et al., 2009). Moreover, competition for places on doctoral level courses, especially those that are partially or fully funded, are very competitive, necessitating an increased ability to demonstrate dedication and competence to achieve a place. While acceptance rates onto doctorate courses are often not widely reported, specific course reports show high competitiveness in various countries. For example, there was a 20% acceptance rate onto UK Clinical Psychology Doctorate courses in 2025 (Clearing House, 2025) and Rackham Graduate School in the US offered 12% of doctoral programme applicants places in 2024 (Rackham Graduate School, 2025).

These structural features of doctoral education may foster uncertainty about competence, heighten sensitivity to academic comparison, and exacerbate doubts about one’s suitability for academic and research work. The pressure to perform at consistently high

standards, coupled with a culture that often emphasises productivity and excellence, can intensify internal pressures and fuel fears of inadequacy, particularly during key milestones such as comprehensive examination, thesis submission and viva defence (Sala-Bubare et al. 2018).

Such structural challenges of doctoral experiences have been reported by studies in diverse student populations and locations, with Roos et al. (2021) finding themes of lack of academic support, disregard of wellbeing and bureaucracy among the main challenges within a multidisciplinary doctoral sample in Estonia. Owens et al. (2020) found themes around suffering from challenging expectations among art and humanities doctoral students in Australia and Nuuyoma et al. (2025) found pressure and length of courses to be a thematic challenge among doctoral students in Namibia. This variety of study samples implies that structural challenges are themes of doctoral training itself, rather than byproducts of location or student body.

Furthermore, the relational environment of doctoral study plays a crucial role in shaping students' academic self-concept. Supervisory relationships can be supportive, empowering, and central to students' development, yet they can also be sources of tension, miscommunication, and evaluative stress (McAlpine and McKinnon, 2013; Pyhältö et al., 2015). When expectations are unclear or supervisory feedback is inconsistent, students may be more likely to interpret challenges as personal failings, reinforcing self-doubt and fragile academic confidence. The wider environment of the university or department, including competitiveness, lack of cohesion, or limited peer support can similarly contribute to feelings of isolation or a lack of belonging, which are well recognised as risk factors for negative academic self-perceptions (Sverdlik et al., 2018).

Doctoral students also face broader systemic pressures, potentially including financial insecurity, competitive future job prospects and the emotional labour of balancing personal or family responsibilities with research, teaching and employment. Evidence suggests that these intersecting demands make doctoral students particularly vulnerable to stress, burnout, depression, and anxiety (Stubb et al., 2011). Sverdlik et al. (2018) reviewed 163 empirical papers on the topic of doctoral education and found financial pressures, supervision experience, personal/social life experience and department

structure to be the most prevalent external themes arising from research of doctoral/PhD students experience, with the most prevalent internal themes being motivation, writing skills and academic identity.

Within this high-pressure environment, where competence is continually evaluated and the stakes for success can feel exceptionally high, experiences of self-doubt, difficulty internalising achievements, and concerns about legitimacy may be especially pronounced. Taken together, these features of doctoral education create conditions under which imposter feelings may readily emerge or intensify. The combination of high expectations, independent work, ambiguous success criteria, and relational or structural stressors makes the doctoral journey a context in which concerns about competence, belonging, and academic identity might emerge for students.

1.3 The current systematic review

Despite the growing interest in IP, existing research has predominantly focused on undergraduate or broad mixed student samples, leaving doctoral and PhD researchers comparatively underexamined. This gap is notable given evidence that doctoral level study involves distinctive structural and psychological challenges.

Doctoral and PhD students represent a particularly relevant population in which to examine IP because doctoral/PhD education differs in important ways from earlier levels of higher education. Whilst undergraduate and Master's programmes may incorporate elements of independent research, doctoral training is distinguished by a sustained emphasis on independent enquiry and the expectation of making an original contribution to knowledge. Students must therefore develop increasing autonomy and expertise whilst working towards outcomes for which expectations and indicators of success may be less clearly defined than at earlier stages of education. Professional doctorates may additionally combine these research demands with the development and evaluation of professional competencies. These characteristics create a context in which individuals are simultaneously expected to demonstrate high levels of competence whilst continuing to develop their expertise, making questions regarding competence, legitimacy and self-evaluation particularly pertinent.

Doctoral training has consistently been associated with heightened psychological strain, including increased stress, anxiety, and emotional exhaustion relative to both the general population and other student groups (Evans et al., 2018; Hazell et al., 2020; Levecque et al., 2017). These findings suggest that features inherent to doctoral education, such as sustained independent work, evaluative supervisory relationships, and variable academic environments, may shape students' sense of competence and belonging (Baker and Lattuca, 2010; Jazvac-Martek, 2009; Lee, 2008; Halse and Malfroy, 2010). Rather than reflecting individual vulnerability alone, such outcomes point to the influence of contextual and structural aspects of doctoral training that may interact with self-evaluative processes.

Given these conditions, doctoral level students may be particularly susceptible to imposter feelings, yet research specifically examining factors associated with IP in this population remains limited. Wang and Li (2023) conducted a relevant scoping review of IP among doctoral students. However, a number of the 30 studies identified in their review consisted of samples not participating in doctoral training, such as undergraduates and adults entering professional life (e.g. Chrisman et al., 1993; Schubert and Bowker, 2019; Lane, 2015). This reflects a broader challenge within the literature, whereby terminology relating to both IP and student populations is used inconsistently, and doctoral participants are sometimes incorporated within wider postgraduate or student samples without their findings being independently identifiable. Consequently, establishing the extent and nature of evidence specifically relating to doctoral students is difficult. This conceptual and population-level ambiguity informed the deliberately broad search strategy adopted within the current review and the requirement that doctoral/PhD participants could be independently identified within included studies.

The current systematic review therefore aims to explore maladaptive factors that are associated with IP in doctoral/PhD students. Focusing specifically on doctoral/PhD populations allows consideration of IP within a group characterised by sustained independent research, increasing autonomy and the development of advanced academic and/or professional expertise, rather than combining these students with broader higher education samples. As evidence suggests that such students face increased pressure and

unique challenges beyond the average college or undergraduate course, a more focused understanding of maladaptive associations with IP in this population may inform universities and course facilitators of influences to consider when structuring courses, approaches to teaching, research and supervisory practices and student learning environments.

2. Methods

2.1 Conduct and reporting

This systematic review was conducted and written in accordance with the PRISMA guidance for systematic reviews (Page et al., 2021). A protocol is accessible via PROSPERO (National Institute for Health and Care Research 2025, ID: CRD420251078856).

2.2 Search strategy

A systematic search, using Boolean operators, was conducted using the following EBSCOhost databases: APA Psycinfo, APA PsycArticles, E-Journals, Academic Search Ultimate, Medline Ultimate and CINAHL. A search of Web of Science was also completed. Given the relatively recent development of the concept of IP, no restriction on time period was applied to searches in order to gather the most relevant papers.

The search terms used were “impost*r (syndrome or phenomenon)” OR “imposterism” OR “impostorism” AND "students" OR "university students" OR "college students" OR "undergraduate students" OR "undergraduate*" OR "bachelor*" OR "postsecondary students" OR "tertiary students" OR "higher education" OR “doctoral students" OR "doctorate students" OR “PhD students" AND "associated with" OR "correlates" OR "predictors" OR "risk factors" OR "determinants" OR "mediates" OR "moderates" OR "mediation" OR "moderation" OR "influencing" OR "related to".

A broad group of terms including all types of postsecondary students was included in the initial search in order to gather the broadest number of papers from which to identify those focusing on doctoral/PhD students. This deliberately inclusive approach was adopted in response to inconsistent terminology and reporting of doctoral populations within the existing literature, reducing the likelihood that relevant studies would be

excluded because they were indexed or described using broader terms such as postgraduate, graduate or higher education students.

Additionally, variation in terminology and spelling relating to IP was similarly accommodated through inclusion of terms relating to both imposter phenomenon and imposter syndrome, alongside imposterism, using both English and American spellings.

To supplement the database searches, the reference lists of studies meeting the inclusion criteria were hand-searched to identify any additional potentially eligible papers that had not been captured through the electronic searches. Titles of potentially relevant references were reviewed against the review criteria. No additional studies meeting the inclusion criteria were identified through this process.

2.3 Inclusion/exclusion criteria

The following inclusion criteria were implemented for studies within the review:

- Population: students currently undertaking a PhD or other doctoral-level programme involving a substantial independent research component, in any year of study, discipline or country.
- The study focus is on IP using either a standardised measure or an accepted definition of IP (allowing for studies with IP as a focus of qualitative research).

Studies were excluded if:

- Not written in English.
- Not empirical studies.
- Systematic or literature reviews.
- They did not have an individually identifiable population of only doctoral/PhD students.
- Scale validation studies.
- Interventions were undertaken.

Systematic searches identified 520 articles, resulting in 351 articles once duplications were removed. All articles were screened against the specified inclusion criteria by two reviewers separately with a kappa of 0.9. Disagreements were discussed to come to a consensus. Following screening at title level, 143 articles were then screened at abstract

level, before 57 full-text articles were screened. A total of 20 articles met the inclusion criteria for this systematic review before quality assessment (see Figure 1).

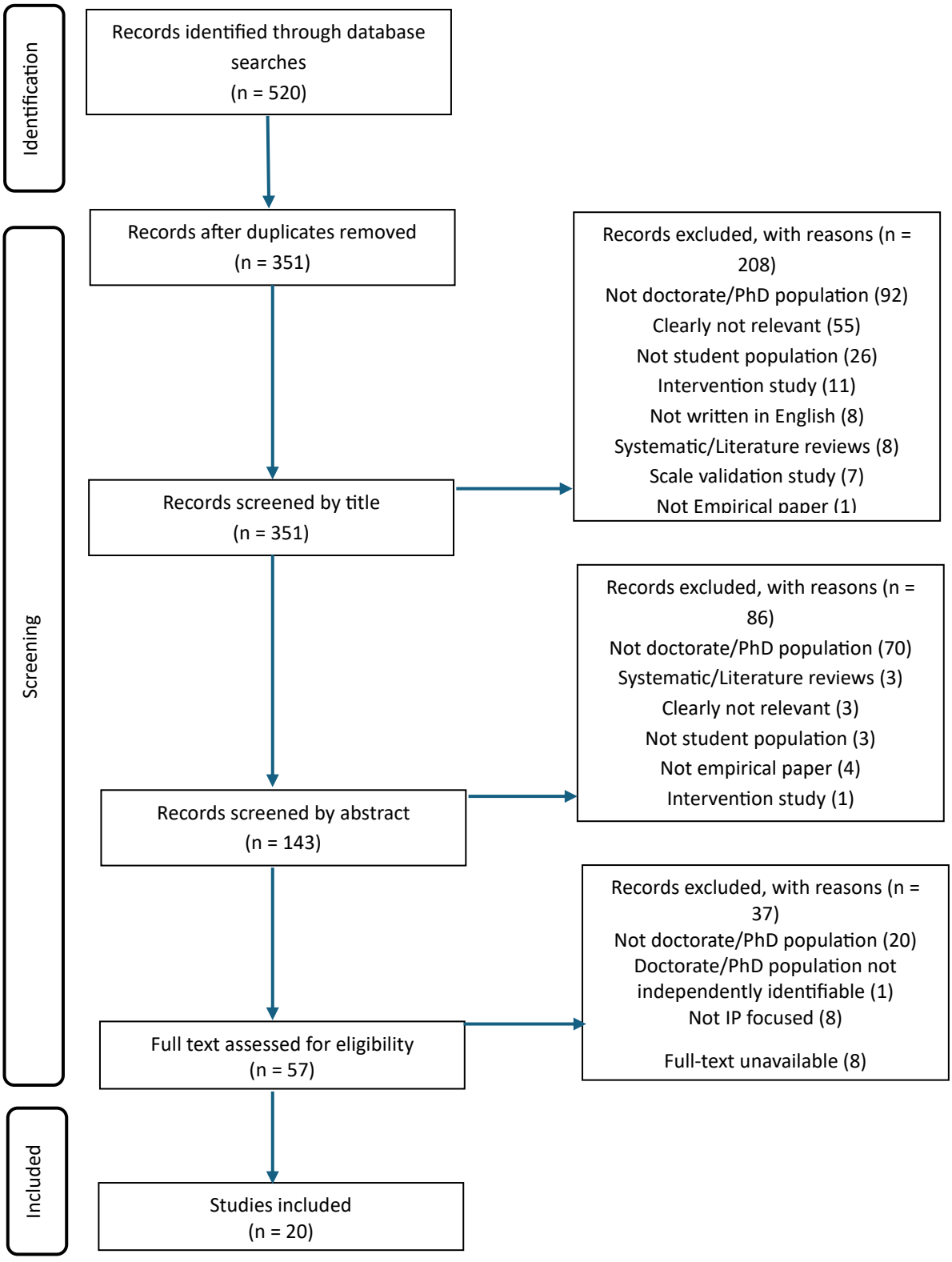


Figure 1. *PRISMA flow chart to show the assessment and eligibility of studies identified*

2.4 Assessment of quality and risk of Bias

All twenty articles were assessed for quality and risk of bias by the primary researcher, as Higgins and Altman (2008) recommend for quality systematic reviews. As the studies included consisted of both quantitative and qualitative methods, quality appraisal of the included studies was conducted using the Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018). The MMAT is a standardised critical appraisal instrument designed specifically for systematic reviews containing a mixture of qualitative, quantitative, and mixed-methods evidence (see Appendix B). It enables reviewers to assess methodological quality across diverse study designs using a single coherent framework, making it especially suitable for the current review.

The MMAT consists of two components: an initial screening section and five sets of criteria tailored to different study types. The screening questions ensure that only empirical studies with clearly described data, methods, and research questions proceed to full appraisal. Following this, each study is evaluated against five methodological criteria corresponding to its design category: (a) qualitative research, (b) randomised controlled trials, (c) non-randomised quantitative studies, (d) quantitative descriptive studies, and (e) mixed methods studies. Each criterion addresses a distinct aspect of methodological quality, including the appropriateness of the sampling strategy, adequacy of the measurements, clarity of the analysis, coherence between data and interpretation, and, for mixed-methods studies, the integration of qualitative and quantitative components.

In line with the MMAT guidance, each criterion is rated as ‘Yes’, ‘No’, or ‘Can’t tell’, allowing for flexible assessment where methodological reporting is incomplete. The MMAT does not recommend calculating an overall numeric score; instead, quality is described narratively, with attention to which criteria were met or not met and how this may influence confidence in the findings. This approach supports nuanced interpretation of methodological quality while avoiding misleading cumulative scores.

To ensure reliability of quality appraisal, a second reviewer independently assessed a subset of four studies (20%). This selection was ensured to include a variety of all three study design categories found within the included studies (qualitative, quantitative

descriptive and mixed method). Any discrepancies in ratings were discussed and resolved through consensus. All twenty studies identified were considered appropriate for analysis.

2.5 Data extraction and synthesis

When reviewing the selected articles, data were extracted systematically using a pre-defined extraction template developed for this review. For each study, information was recorded on: publication details, country, participant characteristics, study design, measures of IP, associated factors examined, and key findings relevant to the review questions (see Table 1).

Given the methodological diversity of the included studies, a narrative synthesis approach was selected to integrate the findings. The studies varied in design (including qualitative, quantitative, and mixed-methods), measurement tools of IP, disciplinary contexts and the range of associated factors assessed. This level of heterogeneity meant that statistical meta-analysis was not appropriate, as assumptions regarding methodological and conceptual homogeneity could not be met. Narrative synthesis, as outlined by Popay et al. (2006), provides a structured, transparent approach for synthesising heterogeneous evidence by focusing on patterns, meanings, and conceptual relationships across studies.

The synthesis followed key elements proposed by Popay et al. (2006), namely developing a preliminary synthesis, exploring relationships within and between studies, assessing the robustness of the synthesis and generating an integrated narrative explanation.

Studies reporting the prevalence or severity of IP were synthesised descriptively, while findings concerning factors associated with IP were compared and organised into higher-order narrative domains.

Initially, findings were assigned preliminary descriptive labels to capture the main factor or association represented. These labels and their corresponding findings were then compared across studies to identify recurring patterns and conceptual relationships. Through this process, preliminary labels were refined as similarities and differences across findings became apparent, before being organised into lower-level subthemes where appropriate and broader narrative domains. For qualitative and mixed-methods studies, reported themes were compared with quantitative associations to explore conceptual overlap.

For example, findings relating IP to depression, anxiety, stress, emotional exhaustion and psychological wellbeing were initially labelled according to the specific factors identified and subsequently compared in relation to their shared association with psychological distress. Findings concerning perfectionism, self-esteem, self-efficacy, self-compassion, rumination and related cognitive or emotional tendencies were compared and organised around patterns of self-critical and internalising psychological processes. Similarly, findings relating to supervision, peer relationships, belonging, family experiences and institutional support were compared to explore common social and relational influences on IP. Findings concerning persistence, procrastination, disengagement and perceived doctoral competence were considered in relation to academic functioning.

Through this process, the synthesis was organised around the prevalence and severity of IP, psychological distress, internalising and self-critical psychological processes, social and relational risk factors, and maladaptive academic functioning and persistence. Where appropriate, lower-level subthemes were developed within these broader domains to capture more specific patterns across the evidence. These domains and subthemes were subsequently used to structure the narrative presentation of findings in Section 3.3, providing a direct link between the synthesis process and the reporting of results. Appendix C provides worked examples illustrating the progression from extracted study findings, through preliminary and refined labels, to the subthemes and final narrative domains used to structure the synthesis. The examples presented are illustrative rather than exhaustive and do not represent every finding included within the synthesis. Findings relating to the prevalence and severity of IP are not included in Appendix C because these were synthesised descriptively rather than through the process of labelling and organisation used for associated factors.

3. Results

3.1 Demographics

All studies were published between 2011 and 2025 and were conducted across various countries (USA, n=13; UK, n=2; Germany, n=1; Tunisia, n=1; Finland, n=1; Austria, n=1; and Italy, n=1). All participants were doctoral or PhD students undertaking studies across a range of disciplines. The variety of disciplines across the studies included populations of

students studying mixed disciplines (n=9), pharmacy (n=2), STEM (n=1), social work (n=1), chiropractic (n=1), management/business (n=1), clinical and counselling psychology (n=1), higher education (n=1), health programmes (n=1), physical therapy (n=1) and mixed education (n=1). The design of the studies included quantitative (n=16), qualitative (n=2) and mixed methods (n=2). The total population sample across all studies was 9448. Some of the studies recruited specific subsets of doctorate/PhD populations, for example one recruited only female participants (Tao and Gloria, 2018), one recruited only participants that were age 30+ (Kheang, 2023) and another recruited only black participants attending Historically Black Colleges and Universities (HBCUs) and Predominantly White Institutions (PWIs) (Hogg, 2023) (see Table 1).

3.2 Measures used

3.2.1 Imposter Phenomenon

Thirteen studies used only the Clance Imposter Phenomenon Scale (CIPS; Clance, 1985) as a measure of imposterism. One study combined the CIPS with an interview (Kheang, 2023) and other combined the CIPS with written open-ended questions about imposterism (Petruzziello et al., 2025). Studies outside of the UK and USA utilised versions of the CIPS translated to their country's native language. One study utilised the Perceived Fraudulence Scale (PFS; Kolligian and Sternberg, 1991; Byrom et al., 2022), one used the Imposter Self-Concept Questionnaire (Rohrmann et al., 2020; Gross et al., 2024) and one utilised their own Doctoral Imposter Syndrome scale (DIS; Nori & Vanttajja, 2023). Of the two studies utilising a purely qualitative methodology, one explored IP through conducting interviews (Bano and O'Shea, 2023) and the other incorporated both an interview and focus group (Craddock et al., 2011).

All quantitative measures of IP used across all studies were reported to have Cronbach's alphas of at least 0.8, indicating high internal consistency and reliability of the measures.

3.2.2 Associated factors

As the current review aims to explore maladaptive factors associated with IP in doctorate/PhD students without a restriction on the topic, a variety of additional measures were used across included studies. These measures assessed variables which the studies hypothesised to be associated with imposter feelings among doctoral and PhD

students. As the current review did not restrict the type of associated factors under consideration, studies examined diverse psychological, social, relational, demographic, and contextual variables. Psychological measures assessed the following constructs: depression, anxiety, stress, perfectionism, self-esteem, self-efficacy, self-compassion, personality traits, and cognitive/emotional tendencies (such as rumination and impulsivity). Social and interpersonal measures included loneliness, belongingness, perceived social support, peer relationships and aspects of the doctoral community or cohort experience. Relational variables were typically assessed through instruments capturing supervisory support and supervisory relationship quality. Several studies also examined contextual or demographic measures, including age, gender, ethnicity and year of study.

Across the 20 studies, the choice of associated measures reflected wide methodological diversity and the multi-dimensional nature of imposter experiences in doctoral education. Although different instruments were used across studies, the constructs measured were broadly comparable, enabling the synthesis of findings into coherent thematic categories rather than focusing on individual scales. Table 1 outlines the characteristics of the included studies and general key findings.

Table 1. *Overview of studies included in narrative review.*

Author and Country	Population	Discipline/Field	Study design	IP measure	Associated factors explored	Additional measures used	Key findings
Nori and Vanttaja (2023). Finland	PhD/Doctoral Students (n=1694)	Mixed disciplines	Quantitative	Study specific Doctoral Imposter Syndrome Scale (DIS)	• Home resources • Parenting style	• Study specific resource and parenting experience questions	Higher IP significantly related to: • Fewer home resources • Less encouraging parenting • Less demanding parenting • Lower level of planning
Boyle et al. (2022). USA	Doctoral Students (n=174)	Pharmacy	Quantitative	Clance Imposter Phenomenon Scale (CIPS)	• Faculty status		• 95.4% of students report some IP feelings. • 58.04% of sample report frequent or intense IP. • No significant difference in mean CIP scores between students and faculty
Byrom et al. (2022). UK	Doctoral Students (n=431)	Mixed Disciplines	Quantitative	Kolligian Perceived Fraudulence Scale	• Perceived stress • Mental wellbeing • Social support • Health • Achievement orientation	• PSS • SWEMWEBS • MSPSS • Youth risk Behaviour Surveillance System • Achievement orientation Scale	Higher IP significantly related to: • Lower mental wellbeing • Higher perceived stress • Weaker academic support • Less satisfaction with living conditions • Lower confidence in finances
Tao and Gloria (2019). USA	Female Doctoral Students (n=224)	STEM	Quantitative	Clance Imposter Phenomenon Scale (CIPS)	• Persistence attitudes • Self-efficacy • Research environment	• P/VVD scale • GSSE • RTES-R-S	• No IP difference across ethnicities • No IP difference across STEM categories • IP negatively associated with persistence attitudes

							• Academic SE mediates IP effect on persistence attitudes • Increased gender representation decreases IP
Hogg (2023). USA	Black PhD students from HBCUs and PWIs (n=209)	Social Work	Quantitative	Clance Imposter Phenomenon Scale (CIPS)	• Doctoral support perceptions • Institutional racial climate perceptions • Depression	• SPOS • MSSS • CEDS	• Depression was a significant predictor of IP • IP significantly correlated to increased minority stress and lower perceived organisational support • CIP scores were significantly higher in non-black vs black PhD students, however race only accounted for 15.9% of this variance
Kimball et al. (2021). USA	Doctoral Students (n=443)	Chiropractic	Quantitative	Clance Imposter Phenomenon Scale (CIPS)	• Gender • Year of study • Type of clinical experience • Primary career choice • Marital status		• Females were significantly more likely to meet criteria for elevated IP than Males (46% vs 32%) • No significant IP difference across year of study, type of clinical experience, marital status or if doctorate was primary career choice
Pervez et al. (2021). USA	Doctoral Students (n=113 survey) (n=9 interviews)	Management/ Business	Mixed methods	Clance Imposter Phenomenon Scale (CIPS) and interviews	• Depression • Anxiety • Social support	• PHQ-9 • GAD-7 • MSPSS • Structured interview questions	• IP significantly associated with increased anxiety and depression • IP not significantly associated with social support • Lack of informational support from faculty a theme associated with intellectual self-doubt and feelings of inadequacy

Tigranyan et al. (2021). USA	Doctoral Students (n=84)	Clinical and Counselling Psychology	Quantitative	Clance Imposter Phenomenon Scale (CIPS)	• Achievement motives • Anxiety • Depression • Self-efficacy • Perfectionist Cognitions • Self-esteem • Self-compassion	• AMS-R • GAD-7 • PHQ-9 • GSE • PCI • RSES • SCS-SF	• 80% of sample reporting at least moderate IP experiences • IP significantly associated with increased depression, anxiety and perfectionist cognitions as well as lower self-compassion and achievement motives • No significant IP differences across gender, age, ethnicity, stage of study, or psychology type
Craddock et al. (2011). USA	Doctoral Students (n=6)	Higher Education	Qualitative	Interview and focus group			• Increased IP thematically linked to self-perceptions of inadequacy, lack of academic preparedness, high family expectations, fear of failure, lack of peers of similar racial identity
Kheang (2023). USA	Doctoral Students age 30+ (n=20)	Mixed Education disciplines	Mixed methods	Clance Imposter Phenomenon Scale (CIPS) and Interviews			• 80% of sample reported frequent or intense IP feelings • IP feelings associated with negative physical and emotional impacts, such as low energy and low self-esteem/compassion • Themes associated with IP include striving for productivity, engaging in self-help and seeking additional training
Jöstl et al. (2012). Austria	Doctoral Students (n=631)	Mixed disciplines	Quantitative	Clance Imposter Phenomenon Scale (CIPS)	• Gender • Research Self-efficacy • Fear of success and failure	• Adapted self-efficacy scale • Vignette scenario scores • RSES	• 82.9% reported symptoms of IP • Females more likely to report increased IP

					• Self-esteem • Faculty membership		• Students employed by the University more likely to report elevated IP • Increased IP predictive of decreased research self-efficacy
Kodweis et al. (2023). USA	Doctoral Students (n=668)	Pharmacy	Quantitative	Clance Imposter Phenomenon Scale (CIPS)	• Personality	• MBTI	• Higher IP scores associated with personality traits of introverts (above extroverts), intuition (above sensing) and perceiving (above judging)
Batchelder (2019). USA	Doctoral Students (n=220)	Health programmes	Quantitative	Clance Imposter Phenomenon Scale (CIPS)	• Self-compassion • Depression • Anxiety • Mental wellbeing	• SCS • DASS-21 • WEMWEBS	• Higher IP scores associated with increased anxiety, depression, lower mental wellbeing, lower self-compassion • Significant interaction effect of self-compassion weakening link between IP and anxiety and depression • Self-compassion a significant mediating effect of IP on wellbeing
Petruzziello et al. (2025). Italy	PhD Students (n=216)	Mixed disciplines	Mixed methods	Clance Imposter Phenomenon Scale (CIPS) and open-ended written questions	• Self-efficacy • Supervisor support • Exhaustion	• GSE • Perceived task-related support scale • MBI	• Higher IP associated with lower self-esteem, higher exhaustion • IP mediated relationship between self-esteem and exhaustion • Lower supervisor support generally moderated effect of Self-esteem on IP. However, those with the lowest self-esteem increased IP when supervisor support was high

							• Themes identified relating to IP; fear of disappointing expectations and feeling inadequacy in their role
Slimi et al. (2024). Tunisia	Doctoral Students (n=562)	Mixed disciplines	Quantitative	Clance Imposter Phenomenon Scale (CIPS)	• Supervisor empathy	• EQ	• Females experience significantly higher IP than Males counterparts (Gender accounting for 4.1% of variance) • Higher IP significantly associated with students who are married, divorced or have children, with employed students and with earlier stage of study • Increased supervisor empathy significantly associated with decreased student IP
Gross et al. (2024). Germany	PhD Students (n=401)	Mixed disciplines	Quantitative	Imposter Self-Concept Questionnaire	• Procrastination • Depression • Self-concept • Self-esteem • Mindfulness • Self-efficacy • Impulsivity • Neuroticism • Conscientiousness • Emotion regulation • Rumination	• FGAP-P • TPS • Mohr and Muller Depressiveness Scale • RSES • MAAS Mindfulness Attention and Awareness Scale • GSE • Kovaleva Impulsivity scale • BFI • ERQ • RSQ	• Latent profile analysis found IP scores to be highest in moderate and strong procrastinator student types (higher procrastination) and internalising types of students (higher impulsivity, lower self-worth, higher neuroticism and rumination)

Berry et al. (2021). UK	Doctoral and PhD (n=3352)	Mixed disciplines	Quantitative	Clance Imposter Phenomenon Scale (CIPS)	• Depression • Anxiety • Suicidality • Perfectionism • Loneliness • Supervisor relationship	• PHQ-9 • GAD-7 • SBQ-R • SAPS • UCLA Loneliness Scale • QSDI	• 27.4% of sample scored in highest 'intense' IP range • Average IP score in the 'frequent IP experiences; range (mean = 69.08) • Greater IP significantly predicted increased depression, anxiety and suicidality • IP positively correlated with loneliness, perfectionism discrepancy (falling short of own standards) • IP negatively correlated with Supervisor support
Crabtree (2024). USA	PhD students (n=163)	Mixed disciplines	Quantitative	Clance Imposter Phenomenon Scale (CIPS)	• Gender • Ethnicity • Disability • Prior education		• 97.5% reported at least moderate experience of IP • 82% reported high or intense IP • Gender, ethnicity, year of study, highest level of education, and presence of an academic mentor were not associated with IP • Presence of condition/disability/diagnosis significantly associated with increased IP • Presence of IP associated with thoughts of quitting their studies
Bano and O'Shea (2023). USA	Doctoral (n=14)	Mixed disciplines	Qualitative	Interview			• Themes associated with IP include family relationships/lack of support, academic competition, females experience of sexism and prior

							history of mental health difficulties
Young et al. (2024). USA	Doctoral (n=593)	Physical therapy	Quantitative	Clance Imposter Phenomenon Scale (CIPS)	• Gender • Ethnicity • Year of study		• 75.6% reported frequent or intense IP symptoms • Females more likely to report IP than males (78.9% of females scoring in frequent range or above vs 59.7% of males) • IP not associated with age or year of education • CIP score >61 associated with increased resource/support seeking, though only 23.7% of those reporting IP sought support • African Americans less likely to report IP and non-African Americans • IP not associated with year of study or age

Note. AMS-R = Achievement Motives Scale Revised; BFI = Big Five Inventory; CEDS = Centre for Epidemiological Studies Depression Scale; DASS-21 = Depression Anxiety Stress Scales 21; ERQ = Emotion Regulation Questionnaire; EQ = Empathy Quotient; FGAP-P = Reasons for Academic Procrastination Questionnaire; GAD-7 = Generalised Anxiety Disorder-7; GSE = General Self-Efficacy Scale; GSSE = Graduate Student Self-Efficacy Scale; MAAS = Mindfulness Attention and Awareness Scale; MBI = Maslach Burnout Inventory; MBTI = Myers-Briggs Type Indicator; MSPSS = Multidimensional Scale of Perceived Social Support; MSSS = Minority Student Stress Scale; PCI = Perfectionist Cognitions Inventory; PHQ-9 = Patient Health Questionnaire-9; PSS = Perceived Stress Scale; P/VVD scale = Persistence/Voluntary Dropout Decision Scale; QSDI = Questionnaire on Supervisor-Doctoral Student Interaction; RSES = Rosenberg Self Esteem Scale; RSQ = Response Style Questionnaire; RTES-S = Research Training environment Scale; SAPS = Short Almost Perfect scale; SBQ-R = Suicide Behaviours Questionnaire-Revised; SCS = Self-compassion scale; SCS-SF = Self-Compassion Scale Short Form; SPOS = Survey of Perceived Organisational Support; SWEMWEBS = Short Warwick-Edinburgh Mental Wellbeing Scale; TPI = Tuckman Procrastination Scale; WEMWEBS = Warwick-Edinburgh Mental Wellbeing Scale.

3.3 Narrative summary of findings

3.3.1 Prevalence and severity of imposter phenomenon in doctoral-level samples

Across doctoral-level samples, IP was consistently widespread, with most studies reporting that a substantial proportion of students experienced at least moderate and often severe imposter feelings. In large quantitative surveys of PhD students, Crabtree (2024) found that 97.5% of participants reported at least moderate IP, with 82% scoring in the high or intense range on the CIPS. Similarly, Berry et al. (2021) reported mean CIP scores in the “high/frequent” range, with over a quarter of UK postgraduate researchers scoring in the highest “intense” category. Kimball et al. (2021) used a customised CIPS cutoff of >61 to measure IP presence, finding rates to be 39% of their chiropractic student sample.

Comparable patterns were observed internationally, with Jöstl et al. (2012) reporting that 82.9% of Austrian doctoral students experienced symptoms of IP and Slimi et al. (2024) showing elevated IP across Tunisian doctoral candidates, particularly in earlier stages of training. High prevalence was also evident in mixed-methods and smaller-scale doctoral studies, including Kheang (2023), where 80% of doctoral students reported frequent or intense IP, and in qualitative work by Craddock et al. (2011) and Bano and O’Shea (2023), where imposter feelings were described as pervasive and enduring features of doctoral life. Studies of various doctorate programme disciplines showed similarly high levels, with 75.6% of Doctor of Physical Therapy students (Young et al., 2024) and over half (57.5%) of management doctoral students (Pervez et al., 2021) meeting criteria for frequent or intense IP, and pharmacy doctoral students largely falling in the moderate-to-frequent range (Boyle et al., 2022). Taken together, these findings indicate that IP is not a marginal experience but a highly prevalent and often significant feature of doctoral-level education across disciplines and national contexts.

3.3.2 Imposter phenomenon and psychological distress

Across quantitative, mixed-methods and qualitative studies, IP showed a strong and consistent association with psychological distress in doctoral populations, including depression, anxiety, stress, emotional exhaustion and suicidality. Large-scale survey

evidence provides the most robust support for this pattern. In a national UK sample of over 3,300 postgraduate researchers, Berry et al. (2021) demonstrated that higher IP significantly predicted greater depression, anxiety and suicidality, even after controlling for demographic, occupational, social and relational variables. IP showed effect sizes comparable to perfectionistic discrepancy and loneliness, indicating that imposter thoughts constitute a substantial and independent psychological risk factor in doctoral students. Similarly, Pervez et al. (2021) found that in management doctoral programmes, higher IP scores were significantly associated with increased depression and anxiety, and that IP partially explained how pre-existing vulnerabilities and academic stressors translated into psychological distress.

These associations were replicated in smaller studies. Tigranyan et al. (2021) reported that IP was significantly associated with higher anxiety, depression and perfectionistic cognitions, as well as lower self-compassion, self-esteem and achievement motivation among 84 psychology doctoral students. Batchelder (2019) likewise found that higher IP was linked to greater depression and anxiety and lower self-compassion and mental wellbeing across doctoral students in health programmes. Petruzziello et al. (2025) extended this pattern by showing that IP was associated with higher emotional exhaustion and mediated the relationship between low self-esteem and burnout, positioning IP as a construct through which self-esteem might contribute to exhaustion and burnout.

Stress emerged as another key maladaptive correlate. Byrom et al. (2022) found that self-depreciation, characteristic of IP, significantly predicted higher perceived stress and lower mental wellbeing in UK doctoral researchers, even when accounting for sleep, physical health, financial security and supervisory support. Berry et al. (2021) similarly showed that IP correlated with occupational strain and poorer wellbeing (increased, anxiety, depression, suicidality), reinforcing that imposterism is not merely an academic confidence issue, but appears to be embedded in students' wider psychological functioning.

Qualitative findings added depth to these statistical relationships. In Bano and O'Shea (2023), doctoral students described imposter feelings as generating cycles of panic, rumination and emotional exhaustion, often accompanied by physical symptoms such as fatigue and sleep disturbance. Craddock et al. (2011) reported that persistent self-doubt

and fear of being exposed as inadequate led students to overwork, withdraw socially, or emotionally disengage. Hogg (2023) similarly found that IP among Black social work PhD students was closely intertwined with depressive symptoms and minority stress (stress stemming from a person of a marginalised group experiencing pressures of prejudice, discrimination and rejection), with students describing constant vigilance and emotional strain associated with trying to prove legitimacy in academic spaces.

3.3.3 Imposter Phenomenon as an Internalising and self-critical psychological style

Across studies, IP clustered not just with distress, but with a distinctive self-critical, internalising profile characterised by perfectionism, low self-worth, reduced self-efficacy, rumination, and avoidant coping. This pattern was observed consistently across large quantitative surveys, smaller doctoral samples, and qualitative interviews.

3.3.3.1 Perfectionism and chronic self-discrepancy

Perfectionism emerged as one of the most consistent psychological correlates of IP. In the large UK postgraduate researcher survey by Berry et al. (2021), imposter scores were strongly and positively associated with perfectionistic discrepancy (the chronic sense of falling short of one's own standards) and this variable was one of the strongest predictors of depression, anxiety, and suicidality alongside IP itself within their study. Similarly, among psychology doctoral students, Tigranyan et al. (2021) found that IP was significantly associated with higher perfectionist cognitions, alongside elevated anxiety and depression.

Qualitative studies supported the idea that discrepancy-based perfectionism is experienced subjectively and contributes to IP. Doctoral students in Craddock et al. (2011), Bano and O'Shea (2023), and Kheang (2023) described students holding unrealistically high internal standards, interpreting minor mistakes as evidence of incompetence, and feeling unable to ever meet the bar required to deserve their place. Rather than motivating performance, these high self-standards produced chronic self-doubt and fear of failure, reinforcing imposter beliefs.

3.3.3.2 Low self-worth, self-esteem, and self-efficacy

Across multiple disciplines, IP was associated with a fragile or negative self-concept. In psychology doctoral students, Tigranyan et al. (2021) reported that higher IP was

significantly related to lower self-esteem, reduced achievement motives, and lower self-efficacy. Similar patterns were observed by Jöstl et al. (2012), who found that higher IP predicted reduced research self-efficacy among Austrian PhD students, even when demographic variables were controlled.

In STEM doctoral students, Tao and Gloria (2019) showed that academic self-efficacy mediated the relationship between IP and intentions to persist with doctoral study. Students with high IP doubted their competence as scientists, and these internal doubts, rather than external barriers, were what undermined their intentions to remain in STEM training. This suggests that IP exerts its maladaptive effect largely through how doctoral students interpret their own ability rather than through objective performance.

Qualitative accounts echoed this. Students repeatedly described feeling intellectually "not good enough" despite strong objective track records (Craddock et al., 2011; Bano and O'Shea, 2023; Kheang, 2023). Many described persistent doubts about whether they genuinely deserved their place in doctoral training, reflecting a strong sense of intellectual illegitimacy.

3.3.3.3 Self-compassion as an opposing psychological process

Several studies showed that IP was not only associated with the presence of negative self-beliefs but also the absence of kindness or compassion to oneself. Tigranyan et al. (2021) found that higher IP was associated with significantly lower self-compassion among psychology doctoral students. Batchelder (2019) extended this by demonstrating that self-compassion significantly moderated the relationship between IP and both depression and anxiety. Students with high IP but high self-compassion reported significantly less psychological distress than those with equally high IP but low self-compassion. This suggests that the maladaptive impact of IP is not fixed but depends on how students emotionally relate to their perceived inadequacy, whether with self-criticism or with understanding and perspective.

3.3.3.4 Internalising personality profiles and cognitive vulnerability

Certain personality profiles linked with maladaptive procrastination were found to be associated with IP. Gross et al. (2024) investigated various measures that might be associated with procrastinating students, using a latent profile analysis in a German PhD

sample. He found that the highest IP scores occurred in internalising and strong-procrastinator profiles, characterised by higher neuroticism, rumination, impulsivity, low self-worth, and depressiveness. These students were not just occasionally procrastinating or anxious, they showed a coherent pattern of emotional and cognitive vulnerability, in which they tended to focus more on their internal experiences than external contexts, making them more prone to self-critical or imposter-related thoughts.

Kodweis et al. (2023) similarly found that IP was elevated in doctoral pharmacy students with introverted, intuitive, and perceiving personality types, which are profiles associated with inward focus, low uncertainty tolerance, and less structured coping. These findings suggested that IP is more common in doctoral students who habitually process stress internally and engage in repetitive self-evaluation rather than external problem-solving approaches.

3.3.3.5 Avoidance, procrastination, and self-doubt cycles

These internalising tendencies also manifested behaviourally. In Gross et al. (2024), the student profiles with the highest IP also showed the greatest academic procrastination, driven by task aversiveness, self-doubt, and rumination. This supports the idea that IP fuels a maladaptive cycle of self-doubt which increases avoidance, avoidance increases pressure and guilt, and these in turn reinforce feelings of fraudulence.

Qualitative participants described similar cycles. Students in Bano and O'Shea (2023) and Kheang (2023) reported oscillating between overworking to compensate for perceived inadequacy and withdrawing when tasks felt overwhelming, both of which deepened their imposter feelings.

3.3.4 Social and relational risk factors for Imposter Phenomenon

Across the reviewed literature, social and relational contexts emerged as central to how IP develops and intensifies in doctoral students. IP was repeatedly linked to the quality of students' relationships with supervisors, peers, families, and institutions, with adverse or maladaptive relationships or communication associated with stronger imposter experiences.

3.3.4.1 Supervisor relationships and academic power dynamics

Several studies showed that unsupportive or emotionally distant supervisory relationships were associated with elevated IP and self-doubt. In the large UK sample reported by Berry et al. (2021), lower supervisory communication, characterised by low warmth, low emotional attunement, and a strong focus on task performance was significantly associated with higher imposter scores, alongside greater depression, anxiety, and suicidality. This suggests that when supervisory relationships are experienced as transactional rather than relational, doctoral students may be more likely to internalise feelings of inadequacy.

Similarly, Slimi et al. (2024) found that lower supervisor empathy was significantly associated with higher imposter scores among Tunisian doctoral students. Indicating that students who perceived their supervisors as less emotionally responsive were more likely to experience themselves as intellectually fraudulent. In contrast, Crabtree (2024) found that neither the presence of a supervisor nor supervisor satisfaction predicted imposter scores. Although, students who described their academic environment as generally "uncomfortable" reported significantly higher IP.

3.3.4.2 Peer comparison, competition and belonging

Peer environments were consistently implicated in imposter experiences. In qualitative studies, doctoral students frequently described comparing themselves unfavourably to peers, particularly in highly competitive academic cultures. Craddock et al. (2011) reported that students monitored the achievements, confidence, and productivity of others and interpreted any perceived gap as evidence that they did not truly belong. Bano and O'Shea (2023) similarly found that continual comparison to colleagues' output, speed, and expertise contributed to persistent self-doubt and feelings of being an intellectual outsider.

These dynamics were particularly salient for students who deviated from perceived norms of the "ideal" doctoral candidate. Kheang (2023) found that non-traditional doctoral students (those aged over 30) often felt out of step with younger, full-time peers, particularly in relation to publications, funding, and research experience. This difference

was frequently interpreted as personal inadequacy rather than as a structural or life-course variation.

Quantitative evidence aligned with these qualitative accounts. In Berry et al. (2021), loneliness was one of the strongest predictors of psychological distress and was positively correlated with imposter thoughts. Students who felt socially disconnected were more likely to experience both emotional distress and imposterism, suggesting that a lack of belonging may amplify feelings of fraudulence.

3.3.4.3 Family relationships and early socialisation

Several qualitative studies suggested that imposter experiences were shaped by relational patterns established before doctoral training. Bano and O'Shea (2023) found that many participants traced their imposter feelings to maladaptive family dynamics characterised by high expectations, emotional criticism, or comparison with siblings. These experiences appeared to contribute to rigid standards of success and heightened sensitivity to evaluation in doctoral contexts.

Similarly, Nori and Vanttaja (2023) reported that lower parental encouragement and fewer emotional and material home resources were associated with higher doctoral imposter scores. Their data showed that students who grew up in less supportive environments were more likely to struggle with planning, self-direction, and confidence, which in turn related to higher IP. Craddock et al. (2011) and Kheang (2023) also described how early experiences of limited validation or disrupted educational pathways fed into later doubts about legitimacy in academia.

3.3.4.4 Social identity, marginalisation, and institutional climate

Several studies demonstrated that IP is closely linked to how doctoral students experience their social identities within academic systems. Hogg (2023) found that higher imposter scores among black social work doctoral students were significantly associated with greater minority stress and lower reported organisational support.

Bano and O'Shea (2023) similarly reported that sexism, racism, and ageism were not viewed by students as contextual stressors but were directly experienced as evidence that they did not belong in doctoral spaces. Women and minoritised students reported

receiving explicit and implicit messages from others that they were less capable, which were then internalised as imposter beliefs.

Quantitative evidence from Berry et al. (2021) supported this pattern indirectly as loneliness, low supervisory collaboration, and weak group belonging were among the strongest correlates of both imposterism and anxiety/depression, indicating that students who felt marginalised within their institutions were more likely to experience themselves as frauds.

Gender emerged as one of the most consistently examined demographic predictors of imposter phenomenon (IP), although findings varied in strength across studies. Several quantitative studies reported significantly higher IP among women. Kimball et al. (2021) found that 46% of female chiropractic doctoral students met the CIPS threshold compared with 32% of males, indicating a robust gender difference. Young et al. (2024) similarly reported that 78.9% of female Doctor of Physical Therapy students met the frequent or intense CIP threshold compared with 59.7% of males. Evidence from the management doctoral programmes studied by Pervez et al. (2021) also indicated higher imposter scores among women, and gender differences emerged as meaningful in the UK survey conducted by Berry et al. (2021), where female postgraduate researchers reported elevated anxiety partly linked to higher imposter thoughts.

Qualitative studies provided mixed evidence. Bano and O'Shea (2023) interviewed both men and women, with both genders reporting strong imposter feelings, suggesting that while gendered patterns exist, imposterism affects students across gender identities. Hogg (2023) further illustrated that among black social work PhD students at HBCUs, imposter experiences were less tied to gender but more strongly related to academic pressures.

Specific findings relating to race and ethnicity were more complex and context specific. Young et al. (2024) reported that African American students in their sample were less likely to meet the IP threshold (59%) compared with students of other racial groups (75.1%), although this difference was no longer significant when gender was controlled, suggesting an interaction between race and gender. Pervez et al. (2021), examining management doctoral programmes, found that racial minority status was associated with

heightened IP, particularly when combined with lower social support or mental health difficulties.

3.3.4.5 Institutional and academic support contexts

Broader academic environments also shaped imposter experiences. In Byrom et al. (2022), weaker academic support networks, including poor role clarity, low inclusion, and limited engagement in research communities, were associated with higher imposterism and self-deprecation, greater stress, and lower mental wellbeing. Similarly, Pervez et al. (2021) found that lack of informational support from faculty was a qualitative theme associated with intellectual self-doubt and feelings of inadequacy.

Furthermore, Young et al. (2024) reported that most students were unaware of institutional resources to address imposter feelings, and fewer than a quarter of those with high IP sought support, suggesting that a lack of awareness of support for IP might perpetuate its high prevalence.

3.3.5 Imposter Phenomenon and maladaptive academic functioning and persistence

Across quantitative, qualitative, and mixed-methods studies, higher imposter phenomenon (IP) was consistently associated with impaired academic functioning, reduced confidence in doctoral competence, and increased risk of disengagement from doctoral study. The most direct evidence linking IP to persistence and attrition risk comes from Tao and Gloria (2019), who showed that among STEM doctoral students, higher IP significantly predicted lower intentions to persist in their programmes. This effect was partially mediated by academic self-efficacy, indicating that students who doubted their legitimacy and competence were less likely to see themselves continuing in doctoral training or STEM careers. This pattern was echoed in Crabtree (2024), where PhD students with higher CIPS scores were significantly more likely to report having considered quitting their programme and leaving academia entirely. These associations occurred even though objective academic markers such as publications, exam completion, and stage of study were not related to IP, suggesting that thoughts to quit were motivated by self-evaluation rather than objective performance.

IP was also linked to lower academic confidence and perceived competence, which are central to effective doctoral functioning. Jöstl et al. (2012) found that higher IP

significantly predicted lower research self-efficacy in Austrian doctoral students, indicating that students with stronger imposter feelings were less confident in their ability to conduct independent research. Similarly, Petruzziello et al. (2025) reported that higher IP was associated with lower self-esteem and higher exhaustion. Students who felt less worthy and competent experienced greater exhaustion partly through elevated imposterism, highlighting how IP might be embedded in deteriorating motivation for academic engagement.

Patterns of avoidance, disengagement, and reduced functional capacity were also evident in behavioural profiles. Consistent with previously described findings (Gross et al., 2024), doctoral students with higher imposter self-concept were more likely to present with internalising and strong-procrastination profiles, suggesting that avoidance-based responses to self-doubt may contribute to impaired academic functioning. Qualitative findings reinforced these quantitative findings. In Craddock et al. (2011), Bano and O'Shea (2023), and Kheang (2023), students described imposterism as producing cycles of overwork, avoidance, and disengagement, where fear of failure and exposure led to procrastination, exhaustion, or withdrawal from academic tasks.

4. Discussion

4.1 What maladaptive features are associated with imposter phenomenon?

This narrative review examined maladaptive associations of IP among doctoral and PhD students across 20 quantitative, qualitative, and mixed-methods studies. Despite variation in discipline, country and methodology a consistent pattern emerged. IP in doctoral students was not a marginal or transient experience, but a pervasive and consequential feature of doctoral training, closely tied to distress, impaired academic functioning, and vulnerability within academic and social environments.

Across studies, IP was not only widespread but also systematically associated with a cluster of maladaptive psychological and academic processes. Doctoral/PhD students with higher imposter feelings were more likely to experience depression, anxiety, stress, emotional exhaustion, low self-efficacy and self-compassion, and to contemplate disengaging from doctoral study or academia altogether (Berry et al., 2021; Pervez et al., 2021; Batchelder, 2020; Tigranyan et al., 2021; Crabtree, 2024; Petruzziello et al., 2025).

These converging findings indicate that IP in doctoral students functions as a central vulnerability that shapes how students experience themselves, their work and their place in academia.

Further to the associations identified, another finding arising from the review process was the difficulty of clearly identifying literature specific to doctoral/PhD populations. Despite the review's focus on doctoral students, searches frequently identified studies using broad or inconsistently defined student categories, including graduate, postgraduate and higher education populations. In some studies, doctoral participants were incorporated within wider student samples without findings being independently identifiable. This difficulty was also apparent within previous attempts to synthesise the literature, including Wang and Li (2023), whose doctoral-focused scoping review incorporated several studies that did not examine doctoral students. This lack of population clarity complicates interpretation of the existing evidence base and may obscure whether associations attributed to doctoral students reflect experiences specific to doctoral training or those shared more broadly across higher education. Greater consistency in defining and reporting educational populations would therefore strengthen future IP research and facilitate more precise synthesis of findings.

The reviewed evidence suggests that IP in doctoral students might be best understood not as a discrete belief about competence, but rather as part of a broader tendency to internalise difficulties, that becomes exacerbated and maintained within the doctoral environment. Previous research has found associations between experience of internalising difficulties and low self-esteem (Keane and Loades, 2017), with further longitudinal evidence demonstrating that lower quality of early home environment significantly predicts lower self-esteem in adulthood (Orth, 2018). Therefore, there may be a potential that doctoral study conditions perpetuate preexisting individual vulnerabilities to IP shaped partially in early life.

Across quantitative and qualitative studies, IP clustered with perfectionism, low self-worth, reduced self-efficacy, fear of failure, rumination, and emotional distress, forming a coherent pattern of self-critical and threat-focused self-processing rather than isolated self-doubt that could be potentially corrected or dismissed. The findings further indicate that this suggested internalising vulnerability does not operate in isolation but is strongly

influenced by the social and institutional settings of doctoral training. Across multiple studies, higher IP was associated with poorer supervisory relationships, lower perceived organisational support, weaker academic networks, greater loneliness, and experiences of marginalisation or exclusion (Berry et al., 2021; Slimi et al., 2024; Hogg, 2023; Byrom et al., 2022; Pervez et al., 2021). These patterns suggest that IP is not merely an individualised problem, but one that is socially regulated.

When doctoral environments are experienced as emotionally distant, competitive, or ambiguous, students who are already prone to self-criticism appear especially likely to interpret difficulty as evidence that they do not belong (Bano and O'Shea, 2023; Kheang, 2023). Conversely, environments characterised by empathy, inclusion, and relational safety may weaken the intensity of imposter beliefs. Previous research has also highlighted the importance of supervisory relationships, departmental climate, and peer integration in shaping doctoral students' academic self-concept and sense of belonging (Gardner and Barnes, 2007; McAlpine and McKinnon, 2013; Pyhältö et al., 2015; Sverdlik et al., 2018). In this sense, IP may be understood as a cognitive and emotional state which is partially relationally maintained, with internal self-criticism potentially activated by external signals of threat, evaluation, or exclusion. This may be attenuated when students experience themselves as seen, supported, and legitimate members of an academic community.

4.2 Relationship to broader literature

The patterns observed in this review closely align with the wider IP literature across higher education and professional groups. The majority of previous IP research has largely focused on undergraduate students (Robinson et al., 2025; Shin and Lytle, 2024; September et al., 2001) or healthcare professionals (Alrashidi et al., 2025; Clark et al., 2022; Jin et al., 2025). Across both of these groups, imposterism has repeatedly been linked to perfectionism (Lee et al., 2021), low self-esteem (Schubert & Bowker, 2019), anxiety (El-Ashry et al., 2024) and burnout (Edwards-Maddox, 2023). The doctoral studies reviewed here show the same constellation of associations, but in a context of heightened academic uncertainty and evaluative pressure.

Doctoral-level training appears to amplify known imposter processes. Unlike earlier stages of education, doctoral level education is an uncommon level of study across the general population, which can provide a unique environment for IP to thrive. Gardner (2008) found themes emerging from interviews with doctoral students relating to integration and becoming an independent researcher which were a notable shift beyond undergraduate study. Further research might be beneficial to consider how individuals experience doctoral education differently to previous levels of study,

4.3 Implications

The findings of this review indicate that IP is a significant potential vulnerability in doctoral-level study. Across the studies reviewed, higher imposterism was associated with depression, anxiety, exhaustion, and reduced persistence, suggesting that IP may signal elevated risk for both mental health difficulties and academic disengagement.

Because imposterism is closely tied to self-critical cognitive styles (e.g. perfectionism, low self-compassion and low self-efficacy), interventions that target how students interpret failure, feedback, and success may be more effective than those that focus solely on skills or productivity. Zanchetta et al. (2020) found interventions focusing on coaching mindset change and personal belief sustainably reduced IP scores beyond those without intervention. This supports the notion within the current review that IP is not primarily a deficit in practical skill but is associated with maladaptive cognitive and emotional processes that may interact with features of the doctoral environment.

The strong associations between IP and supervisory relationships, belonging, and academic support indicate that imposter experiences are shaped by doctoral environments as well as by individual psychology. Supportive, emotionally attuned supervision and clearer role expectations may therefore reduce imposter-related distress even when academic demands remain high. However, the finding by Craddock (2011) that the presence of a satisfying supervisor did not consistency predict lower IP as much as a “comfortable” environment suggests that it is not only the presence of good supervisory relationships that matter, but also the institutional and interpersonal climate in which those relationships are embedded.

More broadly, these findings caution against conceptualising IP solely as an individual vulnerability requiring remediation within the student. Although IP was consistently associated with maladaptive psychological processes including perfectionism, low self-worth, reduced self-efficacy and psychological distress, the synthesis also identified associations with supervision, belonging, peer relationships, organisational support and experiences of marginalisation. This suggests that imposter experiences may arise and be maintained through interactions between individual self-evaluative processes and features of the doctoral environment. Consequently, support focused exclusively on changing individual students' beliefs may overlook contextual factors contributing to these experiences. Doctoral programmes may therefore benefit from combining individually focused support with clear expectations, supportive supervision, opportunities for peer connection and environments that normalise uncertainty as part of ongoing doctoral development without minimising persistent or distressing imposter experiences.

Finally, several studies showed that students with high IP often did not access or even know about available support, suggesting that institutions may need to explicitly recognise imposterism as a legitimate form of distress and make support more visible and accessible.

4.4 Limitations

Although this review identifies a coherent pattern of maladaptive associations with IP, several limitations of the available evidence should be noted. First, all the included studies were cross-sectional. As a result, although IP was consistently associated with distress, exhaustion, and reduced academic functioning, causal direction cannot be reliably established. It remains unclear whether imposter feelings precede poorer mental health, whether distress heightens imposterism, or whether both arise from shared vulnerabilities. There is evidence that both IP and poor mental health can occur in childhood (Leonhardt et al., 2026; Brady and Kendall, 1992), so it is likely that both have roots within early experience requiring further consideration.

Second, most studies relied on self-report measures of IP and mental health, introducing the possibility of response biases such as social desirability (Van de Mortel, 2008). In addition, there was heterogeneity in measures used across studies, with some associated

constructs of IP assessed in only a small number of papers. This limits the extent to which certain findings can be considered consistent across the literature and raises questions about the comparability and psychometric robustness of some reported associations, which would therefore benefit from further investigation.

Third, although the review included studies from multiple countries and disciplines, samples were unevenly distributed, with a strong dominance of U.S. and UK research and professional doctoral programmes. There was comparatively little representation from the natural sciences, humanities, or non-Western doctoral systems. Furthermore, considerable heterogeneity existed within the doctoral population itself. Included participants were undertaking different forms of doctoral study, including research-focused PhDs and professional doctorates, across different disciplines and stages of training. These programmes may differ substantially in their purpose, structure, expectations, professional requirements and balance between independent research and applied training. Consequently, treating doctoral students as a single population may obscure important differences in their experiences and the contexts in which IP develops or is maintained. Cultural and structural differences in doctoral training may therefore be under-represented, and findings should be interpreted cautiously when generalising across different forms of doctoral education.

Lastly, the narrative synthesis applied in this review could be considered to lack robustness in that it offers the perspective of a single researcher. While this is an unavoidable constraint of the analysis type, there are also strengths in the use of a quality review tool to consider the studies included and the use of a second rater to consider the screening process and sample of full-text papers.

4.5 Future research

Future research should move beyond documenting prevalence and associations of IP in doctoral students and focus on clarifying the mechanisms through which IP affects doctoral students' functioning and wellbeing. Longitudinal designs are particularly needed to establish whether imposter feelings precede declines in mental health, academic self-efficacy, and persistence, or whether distress and adversity give rise to imposterism over time. More work is also needed to examine how social and institutional factors, such as

supervisory relationships, departmental climate, and minority stress, interact with individual vulnerabilities to produce or maintain imposter experiences.

Experimental and intervention studies would be especially valuable to test whether modifying processes such as self-compassion, self-criticism, academic self-efficacy, or belonging can reduce imposterism and its consequential effects. Future research would also benefit from greater consistency in defining doctoral populations and reporting participant characteristics. The difficulty encountered within this review in identifying evidence specific to doctoral/PhD students highlights the importance of distinguishing doctoral participants from broader graduate, postgraduate or higher education samples. Where mixed student populations are investigated, findings for doctoral participants should be reported independently where possible. Research should also account for heterogeneity within doctoral education itself, including differences between research-focused PhDs and professional doctorates, stages of training, disciplines and national educational contexts. Greater specificity in reporting these characteristics would enable clearer consideration of whether IP and its associated factors vary across different forms of doctoral education.

Finally, future studies should also seek greater representation across countries and social identities and use mixed-methods and multi-level designs to capture how IP emerges from the interaction between individual psychology and the doctoral environment.

5. Conclusion

This systematic review offers preliminary evidence that IP is associated with maladaptive patterns of psychological, academic, and relational vulnerability among doctoral and PhD students. Further research might aim to expand on the longitudinal effects of IP and further mediating/moderating factors within this population. While high IP prevalence and IP correlations with poorer mental health are well established within this group, further qualitative research on doctoral experiences might help universities and mental health services understand and develop more tailored support for IP in this population.

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Chapter Three – Bridging Chapter

Maladaptive associations of Imposter Phenomenon in Doctoral/PhD students

The previous chapter examined maladaptive associations of Imposter Phenomenon (IP) among doctoral and PhD students in a number of professional disciplines and international contexts. Across the 20 studies included in the review, IP emerged as both highly prevalent and consistently associated with psychological distress, including depression, anxiety, stress, emotional exhaustion, and reduced wellbeing. IP was also linked to academic vulnerability, including reduced research self-efficacy, increased procrastination and greater likelihood of considering withdrawal from doctoral study or academic careers. The findings suggested that IP is not a marginal experience within doctoral education, but a significant feature of doctoral training environments and experiences.

A key pattern emerging from the review was that IP tended to cluster with a broad self-critical and internalising psychological profile, where distress is directed inwards. Across studies, imposter experiences were consistently associated with perfectionism, low self-esteem, reduced self-compassion, rumination, fear of failure, and avoidance. These findings suggest that IP may be embedded within a pattern of perfectionist-related self-evaluation characterised by perceiving oneself to fall short of one's own personal standards, alongside threat-focused interpretation of performance-related experiences. Rather than reflecting isolated doubts about competence, imposter feelings appeared to form part of a broader self-critical style through which individuals interpret success, failure, and feedback.

Perfectionism emerged as one of the most consistent psychological correlates of IP across doctoral populations. Several studies reported strong associations between perfectionistic cognitions (Tigranyan et al., 2021), discrepancy-based perfectionism (Berry et al., 2022), and imposter experiences, alongside shared links with depression, anxiety, and reduced wellbeing (Craddock et al., 2011; Bano & O'Shea, 2023; and Kheang, 2023). This pattern suggests that perfectionistic thinking may represent an important psychological process associated with the experience and maintenance of IP in doctoral students. However, the existing evidence base remains dominated by cross-sectional association studies, and

relatively few studies have examined how perfectionist cognitions relate to IP and wellbeing within specific doctoral training contexts. As a result, the relationship between IP and perfectionism remains under-researched, particularly in professional doctoral populations that have unique academic and employment elements.

Although the review demonstrated consistent associations between IP, psychological distress, and perfectionistic self-evaluation across doctoral populations, it also identified several gaps in the literature. In particular, there remains a need for research examining these relationships within professional doctoral training programmes, where academic demands intersect with professional demands and employment. Compared with broader doctoral and PhD populations, professional trainees often experience additional pressures linked to responsibility, performance accountability, and expectations of competence in applied and work settings. Understanding IP within these contexts may therefore provide a more nuanced account of how imposter experiences operate within training environments that combine academic and professional roles.

UK Trainee Clinical Psychologists

UK clinical psychology doctoral training represents a relevant example of a professional doctoral role, containing a professional role of concurrent employment in clinical settings alongside status as a postgraduate research student in an academic environment, conducting doctoral level research. Within their role, UK Trainee Clinical Psychologists (TCPs) undertake university-based doctoral-level academic study while simultaneously working within National Health Service settings, developing clinical competencies, engaging in supervision, and navigating professional identity development. Entry into training is highly competitive, and trainees often arrive with strong academic and professional backgrounds alongside histories of repeated applications or prior experience in psychologically demanding roles (British Psychological Society (BPS), 2025). Once on training, expectations for and assessment of reflective practice, clinical competence, academic performance, and professional responsibility coexist. These features create a training environment characterised by high standards, frequent evaluation, and ongoing comparison with peers, conditions that align with those identified in the systematic review above as relevant to imposter experiences.

Despite these contextual features, there remains limited quantitative research examining IP within UK TCPs. Existing research within this population has been largely qualitative, highlighting themes of perfectionism, self-criticism, competitiveness, burnout, stress, and procrastination within TCPs (Jones & Thompson, 2017; Taylor, 2022; Tazzini, 2023). These findings suggest that imposter-related and perfectionistic processes may be relevant to trainee wellbeing and training experiences. However, without quantitative investigation, the prevalence of IP and perfectionist cognitions within UK TCPs and the extent to which these constructs relate to psychological wellbeing, remain unclear.

The systematic review therefore provides a rationale for extending research on IP into the context of UK clinical psychology training, while also examining perfectionist cognitions as a theoretically relevant correlate of imposter experiences. Investigating these constructs within a TCP sample allows the exploration of whether patterns observed across broad doctoral/PhD populations are also present within a professional training environment that combines academic performance and evaluation with clinical responsibility.

Accordingly, the empirical study presented in the following chapter examines the prevalence of IP and perfectionist cognitions among UK TCPs and investigates their relationship with psychological wellbeing. In particular, the study explores associations between IP, perfectionist cognitions, depression, anxiety, and self-esteem, and examines whether perfectionist cognitions moderate the relationship between IP and wellbeing outcomes. By building directly on the findings of the systematic review, the empirical study aims to contribute to a more contextualised understanding of imposter experiences within clinical psychology training.

Chapter Four – Empirical Research Paper

A quantitative study exploring the relationship between Imposter Syndrome, Perfectionism and Wellbeing in Trainee Clinical Psychologists during training.

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(Author guidelines for manuscript preparation – Appendix A)

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Abstract

Introduction: Imposter phenomenon (IP) is well-documented in high-achieving academic settings, is associated with poorer mental health and is often associated with high reported perfectionism. However, limited quantitative research has examined IP and perfectionist cognitions in UK trainee clinical psychologists (TCPs), including whether perfectionism moderates the relationship between IP and wellbeing, and whether training-pathway factors (e.g., number of application attempts to training) relate to IP.

Method: In a cross-sectional online survey, 157 UK TCPs completed the Clance Imposter Phenomenon Scale (CIP), Perfectionistic Cognitions Inventory (PCI), PHQ-9, GAD-7, and Rosenberg Self-Esteem Scale, alongside demographic and training background items. Group comparisons and correlations tested associations with IP. Moderation analyses examined whether PCI moderated the association between CIP and depression/anxiety.

Results: IP was highly prevalent: 96.8% reported at least moderate IP and the mean CIP score indicated frequent imposter experiences ($M = 67.54$, $SD = 14.33$). Higher IP was associated with higher depression ($r = .22$, $p = .005$), higher anxiety ($r = .44$, $p < .001$), and lower self-esteem ($r = -.63$, $p < .001$). IP correlated strongly with perfectionist cognitions ($r = .51$, $p < .001$). Demographic/training-pathway variables (gender, ethnicity, disability status, stage of training, prior experience, application attempts) showed no reliable associations with IP. In moderation models, the CIP×PCI interaction was non-significant for anxiety and depression; PCI uniquely predicted depression, and both CIP and PCI predicted anxiety.

Discussion: IP appears pervasive among UK TCPs and is linked to psychological distress and reduced self-esteem. Although perfectionist cognitions and imposterism were strongly related, they did not interact in predicting distress, suggesting parallel rather than multiplicative risk processes. Longitudinal research is needed to clarify directionality and inform trainee support.

Keywords: Imposter Phenomenon, Trainee clinical psychologist, Perfectionist cognitions, Psychological wellbeing

1. Introduction

1.1 Imposter Phenomenon/Syndrome

Imposter Phenomenon (IP), often referred to as imposter syndrome, describes a pattern of self-evaluative beliefs in which individuals perceive their achievements as undeserved and attribute success to external or unstable factors rather than personal competence (Langford and Clance, 1993). This experience is commonly characterised by persistent self-doubt, difficulty internalising success and fears of being exposed as inadequate despite objective evidence of ability. Clance and Imes (1978) originally investigated IP among high-achieving women within academic and professional settings, though the context in which IP is recognised to occur has continued to expand.

Although the terms Imposter Phenomenon and Imposter Syndrome are sometimes used interchangeably within the literature, IP is used throughout the current study. The term 'syndrome' can imply a discrete clinical condition, despite imposter experiences not being recognised as a formal psychiatric diagnosis and being reported across clinical and non-clinical populations (Bravata et al., 2020; Montgomery & Gerhardt, 2025). 'Phenomenon' therefore provides a more appropriate description of a dimensional psychological experience rather than implying the presence of a distinct disorder. Nevertheless, variation in terminology reflects broader conceptual complexity within the literature, in which the boundaries between IP and related self-evaluative and emotional constructs are not always clearly defined.

Since being coined, IP has been observed across genders and ethnicities, especially those within minority demographics of education or workplace settings (Badawy et al., 2018; Caselman et al., 2006). IP has also been observed in neurodivergent student populations (Brown and Morley, 2025), though there is limited research investigating IP correlations with broader groups identifying with disabilities. Furthermore, there is evidence that IP in students from minority ethnicities may be facilitated by factors such as negative stereotypes and insufficient emotional support from family, who lack college experience (Peteet et al., 2015). IP is increasingly prevalent in higher education settings, where it is a "normal part of graduate study" (Craddock et al., 2011), as significant stressors are placed

on students to meet academic demands and perform to high levels of competence in assessments and exams.

The common occurrence of imposter experiences within demanding educational environments also raises questions about when such experiences should be considered maladaptive. Some degree of uncertainty or self-doubt may represent an understandable response to entering unfamiliar roles, receiving evaluation and developing new competencies, rather than indicating psychological dysfunction. Indeed, self-doubt is not necessarily detrimental and may in some circumstances support reflection, openness to feedback and continued development (Rilveria, 2026). However, imposter experiences may become more problematic when they are persistent, resistant to evidence of competence, associated with significant distress, or contribute to avoidance and difficulty pursuing valued academic or professional goals. Distinguishing between potentially adaptive self-evaluative uncertainty and more maladaptive imposter experiences may therefore be important when considering IP within doctoral training.

Student wellbeing has been negatively correlated with IP, with many studies associating high IP with increased depression and anxiety (McGregor et al., 2008; Wolfe, 2021), and some noting similarities in the psychological constructs between IP and depression, with overlaps in self-doubt, negative cognitions and pressure to live up to one's internalised self-image (Cusack et al., 2013). Moreover, IP has been associated with lower self-esteem and self-efficacy across multiple student groups from various ethnic backgrounds across a variety of subjects (Alsaleem et al., 2021; Lige et al, 2017). These associations also highlight the difficulty of drawing clear conceptual boundaries around IP. Self-doubt, negative self-evaluation and concerns regarding competence may overlap with aspects of low self-esteem, perfectionism, depression and anxiety, while remaining theoretically distinguishable constructs. Consequently, associations between IP and psychological distress should not necessarily be interpreted as evidence that these constructs represent the same underlying experience. Instead, examining their relationships may help clarify which psychological processes are shared and which demonstrate independent associations with wellbeing.

1.2 Imposter Phenomenon in academia

As the factors that appear to influence IP are not static, researchers have explored the influence that time of studying/training can have on IP change in academia. While it is often expected that time spent studying/training will increase confidence of students through recognition of their own achievements and exposure to new learning, confidence gains over time have been found to be small and short-lived (Putwain and Sander, 2016). Similar results have been found relating to IP, with Houseknecht et al. (2019) finding that third year medical students reported higher levels of IP than those completing their first year. This was speculated to indicate that despite becoming more competent and knowledgeable, students lack a definition of what success and achievement should look like, and do not have access to adequate emotional or peer support to address feelings of imposterism.

Attribution style and appraisal of events have also been considered a contributing factor to perpetuating IP within students, with individuals high in IP attributing their success to temporary externalised factors (e.g. luck) rather than permanent internal ones (e.g. skill) (Thompson et al., 1998). Such individuals may continuously pursue diligence and hard work in their endeavours and seek perfection in order to compensate for their perceived fraudulence and luck.

1.3 Perfectionism

Perfectionism is typically considered as a disposition characterised by setting excessively high standards of personal performance, evaluating oneself in an overly critical manner and linking personal performance to self-worth (Frost et al., 1990; Smith et al., 2022). Conceptualisations of perfectionism have considered it to be characterised by multiple factors, including a tendency for organisation, parental criticism, high personal standards and concern over mistakes (Frost et al., 1990). Elements of perfectionism have been defined as self-orientated, other-orientated or socially prescribed (Hewitt and Flett, 1991).

Perfectionism has been often studied within the context of higher education settings, due to these settings' natural emphasis on learning, achievement and competition with peers. Across multiple studies, perfectionism has frequently been associated with negative wellbeing outcomes for students, including academic stress, anxiety and depression

(Cowie et al., 2018; Larionow, 2024). While there is evidence that striving for perfectionism in itself can be beneficial in improving academic performance, an overemphasis of perfectionist concerns and cognitions has been linked to negative wellbeing outcomes (Madigan, 2019; Stoeber and Gaudreau, 2017), in part as maladaptive preoccupations, rumination and anxiety have been shown to stifle productive behaviour.

1.4 Perfectionism as a moderator of IP

Perfectionism and IP have frequently been explored in association, due to the overlap in the characteristics of both constructs. For example, similar cognitive distortions regarding self-criticism, unrealistic goals, overgeneralising mistakes and all-or-nothing thinking occur across IP and perfectionism (Thompson et al., 2000). Thompson et al. also note that individuals with high IP tend to overestimate their mistakes and be less appreciative of their own performance, similarly to perfectionists. Moreover, Ferrari and Thompson (2006) demonstrated that both perfectionists and 'imposters' share fears in how they present themselves to others when feeling threats to their self-worth. Such links between the nature and presentations of these factors highlight the potential for a moderating effect between the two constructs.

As previously noted, both IP and perfectionism have been linked to negative mental health outcomes, such as low self-esteem and depression (McGregor et al., 2008; Rnic et al., 2021), with growing research investigating the prevalence and impact of IP and perfectionism across populations (Bravata et al., 2020; Stoeber and Stoeber, 2009). Students and employees within the fields of medicine and mental health are a specific focus of research (Haar and de Jong, 2024; Thomas and Bigatti, 2020), as it is recognised that these are fields are prone to highly stressful and demanding environments that exhibit a high level of burnout and compassion fatigue (Ray et al., 2013; Bhutani et al., 2012), both factors that IP and perfectionism have been found to associated with (Clark et al., 2022; Hill and Curran, 2016).

Due to the association between IP and perfectionism there is a potential for further research to consider the presence of interaction effects between these constructs. This relationship merits investigation as, while there is currently not a generally established

theory outlining how IP and perfectionism may directly impact upon each other, there is growing evidence of interaction effects. For example, Pakozdy et al. (2024) found IP to mediate the relationship between perfectionism and happiness within a sample of university students, and perfectionism to mediate the relationship between gender differences of IP. Moreover, Sheveleva et al. (2023) found IP and maladaptive perfectionism (as defined by Stoeber and Otto, 2006) to be linked to each other by the mediating factor of self-esteem, within a sample of college students. Examples of these interactions between perfectionism and IP, alongside their overlap with constructs such as self-esteem and psychological distress, highlight the conceptual complexity of their relationships and provide a basis for further investigation of the extent to which they represent overlapping or independently associated psychological processes across populations.

1.5 Clinical Psychology training

Training to be a Clinical Psychologist within the UK combines both intensive higher education demands and employment in an ever-demanding mental health sector of the National Health Service (NHS). The process to enrol on Clinical Psychology doctoral training within the UK is time and resource intensive and highly competitive, in part due the educational funding and salary provided during training, as such funding is not provided universally among other mental health training courses, or similar training in other countries.

Many trainees are unsuccessful in their initial application attempts to gain entry onto the course and therefore may apply multiple times before being accepted, with 20% of applicants gaining a place on training in 2025 (Clearing House, 2025). Such contextual factors provide a potential basis for an environment in which feelings of IP and perfectionism may develop or be exacerbated, as there is fierce competition with peers and high levels of achievement are required to differentiate oneself from other applicants and to then meet expectations and achieve when on the course. To date, however there is no empirical research directly examining if application attempts are associated with IP, therefore the role of repeated exposure to a competitive selection process and its role in shaping imposter experiences remains unexplored.

While the impact of IP and perfectionism on wellbeing has been well documented in students and select medical professions, as previously referenced, there is a lack of research on their quantitative prevalence and effect in Trainee Clinical Psychologists (TCPs) within the UK. However, there is growing qualitative evidence suggesting that UK TCPs experience elements of perfectionist and imposter cognitions that affect their training experience, through factors such as burnout, stress and procrastination (Jones and Thompson, 2017; Taylor, 2022; Tazzini, 2023). Therefore, this prompts the need for further consideration of prevalence and impact.

Without further evidence on the prevalence of IP and perfectionism in UK TCPs, the extent to which training courses may need to tailor their input to support TCPs appropriately cannot be fully understood. Furthermore, there are aforementioned factors that have been demonstrated to be associated with elevated IP among higher education and employment settings within recent literature that have not been sufficiently considered within UK TCPs. These include the impact of being from a minority background (Hewertson and Tissa, 2022) or the impact of advancing through years of the course. There is also a lack of research into other factors potentially associated with IP in student populations in general, such as identifying with having a disability or making multiple applications to be accepted onto a course. Moreover, there is a need for more research investigating how potential factors, including perfectionism, might moderate the effect of IP on TCP wellbeing, given the overlap in these psychological constructs.

1.6 The current study

Given the conceptual overlap between IP, perfectionism and indicators of psychological wellbeing, the present study does not seek to establish these as entirely discrete or causally ordered constructs. Instead, it aims to contribute to understanding part of this complexity by examining their relationships within a defined professional doctoral population of UK TCPs. In particular, examining IP alongside perfectionistic cognitions, depression, anxiety and self-esteem allows consideration of the extent to which these constructs are associated, while moderation analyses provide a more specific test of whether perfectionistic cognitions alter the relationship between IP and psychological distress. This may help clarify whether perfectionism intensifies the association between

imposter experiences and poorer wellbeing or whether these constructs demonstrate related but partly independent associations.

This current study aims to utilise survey methods and quantitative analysis to investigate the prevalence of IP and perfectionism within the UK TCP population and explore factors associated with IP and trainee wellbeing. The research questions explored will be:

1. What is the prevalence of elevated feelings of IP in UK TCPs?
2. How is the prevalence of IP correlated across demographic factors in UK TCPs?
3. Do perfectionist cognitions moderate the impact of IP on anxiety or depression in UK TCPs?

Within these research questions the following hypotheses will be investigated:

1. Higher levels of IP will be reported by trainees of minoritised backgrounds.
2. Years of employment experience within the psychological field and years in clinical training will be negatively associated with feelings of IP.
3. Higher reported levels of IP will be positively associated with higher perfectionist cognitions, depression and anxiety.
4. Perfectionism will be a significant moderator in the link between IP and trainee wellbeing.

2. Method and materials

2.1 Design

This study used a quantitative within-subject correlational design. Participants responded to closed questionnaire items via an online survey tool (JISC) to provide data regarding a cross section of UK TCPs.

2.2 Participants

A sample of 157 participants enrolled within UK clinical psychology doctoral Programmes participated in the study. Recruitment was completed through both an online poster advertisement on social media platforms (see Appendix D) and dissemination of recruitment emails by individual university admin teams to their cohorts of TCPs, at the

request of the primary researcher (see Appendix E). Participants were required to be at least 18 years of age and currently enrolled on a clinical psychology doctoral programme within the UK. Trainees were excluded if they were studying at the University of East Anglia (UEA).

2.3 Ethical approval and considerations

The current study was granted ethical approval by the UEA Faculty of Medicine and Health Sciences Research Ethics Committee (REF: ETH2324-3017; see Appendix F). The study adhered to the British Psychological Society Code of Human Research Ethics (BPS, 2021).

Informed consent was obtained electronically as part of the online survey prior to participation (see Appendix G). Participants were required to confirm that they had read the provided participant information sheet (see Appendix H) and consented to take part before accessing the survey. They were also informed of their right to withdraw during survey completion by exiting their browser.

No personally identifiable information was collected, and responses remained anonymous throughout. Data were initially stored in a password protected JISC online surveys account and were permanently removed from this account and stored on an IBM SPSS statistics 31.0 database when data collection was completed. The data was stored securely on UEA's encrypted OneDrive system in accordance with the Data Protection Act (2018) and UEA research data management policy (UEA, 2025). Access to the data was restricted to the researcher and supervisory team. Participants were invited to enter a raffle for £20 Amazon vouchers following survey completion by entering a chosen email into a Microsoft forms survey unconnected from their JISC survey responses. This form was deleted once recipients were contacted.

Given that survey measures included items relating to mood, anxiety, and self-esteem, participants were provided with information about sources of psychological support within both the participant information sheet and debrief materials. A debrief sheet was provided following completion (see Appendix I), outlining the study purpose, researcher contact details, and procedures for raising concerns or complaints.

2.4 Measures

The following measures were used to capture data regarding the research questions:

Demographics and background characteristics. Participants were asked nine questions relating to their age, gender, ethnicity, potential presence of disability, years of prior psychology work experience, number of application attempts to the doctorate course and stage of training (see Appendix J). This information provided a participant overview to consider demographic differences associated with IP.

Imposter Phenomenon: Clance Imposter Phenomenon scale (CIP; Clance, 1985). The CIP consists of a 20-item self-report questionnaire measuring imposterism on a five-point Likert scale of 1-5, considering the extent to which individuals consider their successes to be generated by external events, alongside feelings of personal incompetence, producing continuous data out of a maximum score of 100. Research has supported the validity of IP as an independent concept and the measure demonstrates a high level of internal consistency, with alpha values around 0.92 (Chrisman et al., 1995; French et al., 2008). Clance (1985) proposed cut off scores for the measure, enabling it to provide categorical data indicating the extent of an individual's experience of IP; with a score of 40 or less indicating few characteristics of IP; 41-60 indicating moderate characteristics; 61-80 indicating frequent feelings of IP; and a score higher than 80 indicating intense IP experiences.

Perfectionism: Perfectionistic Cognitions Inventory (PCI; Flett et al., 1998). The PCI consists of a 25-item self-report questionnaire investigating the frequency of perfectionistic thoughts on a five-point Likert scale of 0-4, producing continuous data out of a maximum score of 100. Historically, measures of perfectionism have focused on enduring dispositions of trait perfectionism, for example, the Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990), which assesses traits of perfectionism that are directed either at the self or others. While such perfectionism measures consider perfectionism as stable over time, the PCI considers perfectionism from a cognitive perspective, which is naturally more variable and dependent on the current state of an individual's life (Flett et al., 2007).

The PCI was selected in preference to trait-based perfectionism measures due to its focus on the frequency of perfectionistic automatic thoughts. This emphasis on cognitive processes aligns conceptually with the self-evaluative features of IP and provides a dimensional measure suitable for examining associations and interaction effects within regression-based analyses. Research has supported the criterion validity and reliability of the PCI, and it demonstrates a high level of internal consistency, with alpha values around 0.95 (Flett et al., 2007).

Depression: Patient Health Questionnaire (PHQ-9; Kroenke et al, 2001). The PHQ-9 consists of a nine-item self-report questionnaire measuring depression symptoms on a four-point Likert scale of 0-3, producing continuous data out of a maximum score of 27. It has been demonstrated to have strong validity and reliability, with a high internal reliability ($\alpha = 0.89$) (Kroenke et al., 2001). Kroenke et al. suggest that when interpreting scores, 0-4 indicates a none-to-minimal presence of depressive symptoms; 5-9 indicates a presence of mild symptoms; 10-14 indicates a presence of moderate symptoms; 15-19 indicates a moderately severe presence of symptoms; and a score of 20 or above indicates a severe presence of symptoms. This enables the PHQ-9 to provide categorical data indicating the extent of an individual's experience of depression symptoms.

Anxiety: Generalized Anxiety Disorder scale (GAD-7; Spitzer et al, 2006). The GAD-7 consists of a seven-item self-report questionnaire measuring generalised anxiety symptoms through a four-point Likert scale of 0-3, producing continuous data out of a maximum score of 27. It has demonstrated high levels of validity and reliability, with a Cronbach's alpha value of 0.89 within a general population sample (Lowe et al., 2008). Spitzer et al. (2006) suggest that when interpreting scores, 0-4 indicates a none-to-low risk of general anxiety symptoms; 5-9 indicates a presence of mild symptoms; 10-14 indicates a presence of moderate symptoms; 15 or above indicates a severe presence of symptoms. This enables the GAD-7 to provide categorical data indicating the extent of an individual's experience of generalised anxiety symptoms.

Self-esteem: Rosenberg Self-esteem scale (RSES; Rosenberg, 1965). The RSES consists of a 10-item self-report questionnaire measuring positive feelings towards oneself through a four-point Likert scale of 0-3, producing continuous data out of a maximum score of 30. As a measure it demonstrates high levels of discriminant validity and internal reliability, with

Sinclair et al. (2010) finding it to demonstrate a Cronbach's alpha value of 0.91 within a general population sample. A higher score within the measure is indicative of a higher level of self-esteem.

3. Results

3.1 Sample demographics

157 UK Trainee Clinical Psychologists responded to the survey. The vast majority of respondents were female (87.3%), with 62.4% of the sample being under the age of 30 and 89.2% being under the age of 35. 82.8% of the sample were white, with 17.2% being other ethnicities. 22.3% identified as having a disability and 78.3% had a postgraduate degree. 43.9% were in the first year of their training, 25.5% were in their second and 30.6% were in at least their third year. The mean number of years previous experience was 3.95 (SD=1.95). The mean number of application attempts before getting onto training was 2.29 (SD=1.43). An overview of demographic factors within the sample can be seen in Table 1.

Table 1. *Participant Descriptive Statistics (n = 157)*

	n (%)
Gender	
Male	18 (11.5%)
Female	137 (87.3%)
Non-Binary	1 (0.6%)
Prefer not to say	1 (0.6%)
Age	
18 – 24	5 (3.2%)
25 – 30	93 (59.2%)
31 – 35	42 (26.8%)
36 – 40	10 (6.4%)
41 – 45	5 (3.2%)
51 - 55	2 (1.3%)
Ethnicity	
White	130 (82.8%)
Mixed/Multiple ethnic groups	12 (7.6%)
Asian	6 (3.8%)
Black/African/Caribbean	7 (4.5%)
Other	2 (1.3%)
Disability	
Yes	35 (22.3%)
No	120 (76.4%)
Prefer not to say	2 (1.3%)
Highest Education Level	
Bachelor's	43 (27.4%)
Master's	104 (72.6%)
Doctorate	9 (5.7%)
Other	1 (0.6%)
Stage of Training	
Year 1	69 (43.9%)
Year 2	40 (25.5%)
Year 3+	48 (30.6%)
Years Previous Experience	
Less than 1 year	3 (1.9%)
1 year	5 (3.2%)
2 years	37 (23.6%)
3 years	28 (17.8%)
4 years	26 (16.6%)
5 years	29 (18.5%)
6 years	10 (6.4%)
7 years	5 (3.2%)
8 years	14 (8.9%)

3.2 IP Prevalence

The mean level of imposter feelings, as measured by CIP scores, was 67.54 (SD = 14.33), meaning that on average participants within the sample reported frequent IP experiences. A large majority of 96.8% of the sample reported at least moderate IP experiences. Specifically, 3.2% reported few IP characteristics, 26.8% reported moderate IP experiences, 52.9% reported frequent IP experiences and 17.2% reported intense IP experiences. This breakdown can be seen in Table 2.

Table 2. *Frequency of elevated CIP scores*

	n (%)
CIP	
Few IP Characteristics	5 (3.2%)
Moderate IP Experiences	42 (26.8%)
Frequent IP Experiences	83 (52.9%)
Intense IP Experiences	27 (17.2%)

3.3 Gender

A chi-square test of independence was conducted to examine whether the prevalence of elevated IP differed by gender. Because only two participants identified as a gender other than male/female, this subgroup was too small to meet minimum expected cell count assumptions for chi-square analysis (McHugh, 2013). Therefore, analyses comparing gender and IP categories were conducted using only participants identifying as male or female (n = 155). Similarly, initial analyses examined differences in CIP category by gender using the full four-level CIP classification. However, this 2×4 chi-square table contained multiple cells with expected counts below 5, violating the assumptions required for a valid chi-square test. To address this and align the analysis with the study's focus on prevalence of elevated imposter feelings, CIP categories were collapsed into two groups: 'few IP characteristics' and 'elevated IP' (combining moderate, frequent, and intense levels). This resulted in adequate expected cell sizes and allowed the use of a valid 2×2 chi-square analysis. Thus, the decision to use a dichotomised CIP variable was based both on statistical assumptions and on conceptual alignment with the research aims.

The chi-square test was not statistically significant, $\chi^2(1, N = 155) = 4.06$, $p = .044$ (continuity-corrected $p = .192$; Fisher's exact $p = .103$). Although the uncorrected chi-

square reached the .05 threshold, both the continuity correction and Fisher's exact test, which are more appropriate given small expected counts, indicated a non-significant association. Proportionally, 97.81% of females and 88.89% of males reported elevated IP. The effect size was small, Φ = .16. Overall, gender was not reliably associated with the prevalence of elevated IP once adjusted for small cell sizes.

Because CIP is a continuous scale, a secondary analysis was conducted using an independent-samples t-test to explore whether mean CIP total scores differed between male and female trainees. Inspection of CIP total scores for male and female trainees indicated a slight deviation from normality based on the Shapiro–Wilk test (W = .978, p = .015). However, given the large sample size and the small magnitude of skewness (–0.21) and kurtosis (–0.69), the distribution was considered approximately normal for the purposes of parametric analysis (Ghasemi and Zahediasl, 2012). The t-test showed no significant gender differences in CIP total scores, t(153) = –0.86, p = .389, with males (M = 64.31, SD = 15.73) and females (M = 67.43, SD = 14.19) reporting comparable levels of imposter feelings. Together, these analyses indicate that imposter experiences did not significantly differ between male and female trainees, regardless of whether IP was examined categorically or continuously.

3.4 Ethnicity

A one-way ANOVA was conducted to examine whether levels of IP differed across ethnic groups. CIP total scores were approximately normally distributed within groups, and Levene's test indicated that the assumption of homogeneity of variances was met, $F(4,152) = 2.26$, $p = .065$. There was no statistically significant effect of ethnicity on CIP total scores, $F(4,152) = 0.39$, $p = .814$, $\eta^2 = .01$, indicating only 1% of the variance in CIP scores was explained by ethnicity. Post-hoc Games–Howell comparisons revealed no significant pairwise differences between any ethnic groups (all $p > .60$). These results suggest that CIP scores did not differ meaningfully by ethnic background in this sample.

3.5 Stage of training

A one-way ANOVA was conducted to examine whether CIP scores differed by stage of clinical training (Year 1, Year 2, Year 3+). Levene's test indicated that the assumption of homogeneity of variance was met, $F(2,154) = 1.78$, $p = .173$. The ANOVA revealed no

significant effect of training stage on CIP scores, $F(2,154) = 0.93$, $p = .395$, $\eta^2 = .012$, indicating that imposter feelings were similar across the three training groups. Post-hoc Games–Howell tests confirmed that no pairwise group differences were significant (all $p > .39$).

3.6 Years of previous experience

A Pearson product–moment correlation was conducted to examine whether the number of years of prior psychological work experience was associated with trainees' CIP score. Assumptions of linearity and continuous measurement were met, and the variable representing years of experience was analysed using continuous values (e.g. 0.5, 1, 2 years' experience etc.). The analysis showed that years of experience was not significantly correlated with imposter feelings, $r(155) = –.13$, $p = .107$. Although the relationship was negative in direction, indicating that greater experience tended to correspond with slightly lower CIP scores, the effect size was small and not statistically meaningful.

3.7 Application attempts

A Pearson product–moment correlation was conducted to examine whether the number of clinical psychology application attempts was associated with trainees' imposter phenomenon scores. The analysis showed no statistically significant relationship between CIP total scores and number of application attempts, $r(155) = –.08$, $p = .303$. This indicates that trainees' level of IP did not significantly differ across application attempts.

3.8 Disability

To examine whether CIP scores differed based on disability status, an independent samples t-test was conducted. The "prefer not to say" category (n = 2) was excluded due to insufficient sample size, leaving participants who reported a disability (n = 35) and those who did not (n = 120). CIP scores were approximately normally distributed within each group, and Levene's test indicated that the assumption of homogeneity of variance was met, $F(1,153) = 0.02$, $p = .900$. The analysis showed that trainees with a disability ($M = 69.83$, $SD = 15.15$) did not differ significantly from those without a disability ($M = 66.83$, $SD = 14.11$) on CIP total scores, $t(153) = 1.09$, $p = .278$ (two-tailed), 95% CI [–2.44, 8.45]. This indicates that CIP scores did not vary as a function of disability status in the sample.

Table 3. *Pearson's correlations of CIP, PCI, PHQ, GAD and RSES*

Variable	CIP	PCI	PHQ	GAD	RSES
CIP	1	.510**	.222**	.436**	-.626**
		<.001	.005	<.001	<.001
PCI		1	.299**	.467**	-.463**
			<.001	<.001	<.001
PHQ			1	.663	-.470
				<.001	<.001
GAD				1	-.549**
					<.001
RSES					1

**=Correlation is significant at the 0.01 Level (2-tailed)

3.9 Depression, anxiety and self-esteem

Bivariate Pearson correlations were conducted to examine the associations between IP (CIP total score), depression (PHQ-9), anxiety (GAD-7), and self-esteem (RSES). Higher CIP scores were significantly associated with higher depressive symptoms (r = .22, p = .005) and higher anxiety symptoms (r = .44, p < .001). CIP was also strongly and negatively correlated with self-esteem (r = –.63, p < .001), indicating that trainees reporting more intense imposter feelings tended to report lower self-esteem. All associations were in the expected directions and statistically significant at the p < .01 level. An overview of these correlations is in Table 3.

No correction for multiple comparisons was applied to these correlations as they were hypothesis-driven and addressed a small number of theoretically specified associations between IP and wellbeing outcomes. Applying a Bonferroni correction in this instance might be overly conservative and reduce statistical power (García-Pérez, 2023). Notably, all observed correlations remained statistically significant when applying a conservative Bonferroni-adjusted alpha level (α = .017).

3.10 Perfectionist cognitions

The mean level of perfectionist cognitions was 46.83 (SD = 20.22). A Bivariate Pearson correlation demonstrated that higher CIP scores were significantly associated with higher PCI scores (r = .51, p < .001), indicating a strong correlation between IP and perfectionist cognitions.

3.11 The impact of perfectionism on IP, anxiety and depression

To test whether perfectionist cognitions moderated the association between imposter phenomenon and anxiety/depression, centred variables were used for CIP and PCI scores. Centring (subtracting the sample mean from each participant's CIP and PCI total score) is recommended in moderation analyses because it substantially reduces multicollinearity between the predictor, the moderator, and the interaction term (Aiken and West, 1991). Therefore, centring was applied to allow for accurate estimation and interpretation of the moderation effects.

A moderation analysis was conducted using centred CIP and PCI scores and their interaction term to test whether perfectionistic cognitions moderated the relationship between IP and GAD-7 anxiety symptoms. The overall model significantly predicted GAD-7 scores, $F(3,153) = 19.18$, $p < .001$, $R^2 = .27$. CIP was a significant predictor of GAD-7, $F(1,153) = 10.69$, $p = .001$, as was PCI, $F(1,153) = 17.36$, $p < .001$. However, the CIP × PCI interaction term was not significant, $F(1,153) = 0.52$, $p = .473$, indicating that perfectionist cognitions did not moderate the association between IP and anxiety.

Similarly, a moderation analysis was conducted using centred CIP and PCI scores to examine whether perfectionism moderated the association between IP and PHQ-9 depressive symptoms. The overall model was statistically significant, $F(3, 153) = 6.55$, $p < .001$, explaining 11.4% of the variance in PHQ-9 scores (adjusted $R^2 = .096$). The interaction between CIP and PCI was not significant, $F(1, 153) = 3.08$, $p = .081$, $\eta p^2 = .020$, indicating no evidence of moderation. Examination of the main effects showed that CIP scores were not a significant predictor of depressive symptoms, $F(1, 153) = 0.86$, $p = .354$, $\eta p^2 = .006$, whereas perfectionist cognitions were a significant positive predictor, $F(1, 153) = 8.62$, $p = .004$, $\eta p^2 = .053$. Thus, higher perfectionist cognitions were uniquely associated with greater depressive symptoms once imposter feelings were accounted for. Further details of the moderation analysis are in Table 4.

Table 4. *Moderation analyses predicting PHQ-9 and GAD-7 from CIP, PCI and their interaction*

Outcome variable	Predictor (centred)	SS	Df	MS	F	p	η^2
PHQ-9	CIP	21.020	1	21.020	0.863	.354	.006
	PCI	209.940	1	209.940	8.621**	.004	.053
	CIP x PCI	74.940	1	74.940	3.077	.081	.020
	Error	3725.682	153	24.351			
Model R^2 = .114 , Adj. R^2 = .096							
GAD-7	CIP	181.11	1	181.11	10.691**	.001	.065
	PCI	294.131	1	294.131	17.363***	<.001	.102
	CIP x PCI	8.786	1	8.786	0.519	.473	.003
	Error	2591.847	153	16.940			
Model R^2 = .273 , Adj. R^2 = .259							

** = $p < .01$, ***= $p < .001$.

4. Discussion

4.1 Interpretation of findings

The present study examined IP, perfectionist cognitions, and wellbeing among TCPs in the United Kingdom. IP was found to be extremely prevalent within the sample, with 96.8% reporting at least moderate IP experiences and an average CIP score falling within the 'frequent' experiences range (M=67.54). These results suggest that TCPs experience IP at a higher rate than broad mixed population samples, which have been estimated to have IP prevalence up to ~82% (Bravata et al., 2020). However, the IP prevalence in the current study is comparable to others that have explored IP in doctoral/PhD populations. For example, Crabtree et al. (2024) found 97.5% of a mixed sample of PhD students to report at least moderate IP experiences, and Berry et al. (2021) found an average CIP score of 69.08 in a large doctoral student sample. When situated in the literature, these results

suggest that the high prevalence of IP in TCPs might not be unique to TCPs themselves, but part of a shared pattern across doctoral populations.

Moreover, imposterism was significantly correlated with key indicators of psychological distress, including symptoms of depression, anxiety, and reduced self-esteem, which aligns with established research suggesting that imposter feelings heighten vulnerability to internalising difficulties (McGregor et al, 2008; Al Lawati et al., 2025). The strong negative correlation between IP and self-esteem was particularly notable and mirrors findings in broader student and professional populations, where self-evaluative deficits play a central role in imposter experiences (Cokely et al., 2018; Mehrabizadeh-Honarmand et al., 2005).

This pattern is also consistent with findings from doctoral-level samples in previous studies, where IP has been shown to be strongly linked to increased depression and anxiety, diminished self-worth and academic self-confidence (Pervez et al, 2021; Kheang, 2023). For example, Tao and Gloria (2019) found that higher imposter scores among doctoral students were associated with lower academic self-esteem and greater self-doubt, while studies of UK and European PhD candidates have similarly identified self-critical self-evaluation as a central correlate of imposter experiences (Byrom et al., 2022; Nori and Vanttaja, 2023). Together, these findings suggest that impaired self-evaluation may represent a common psychological pathway linking imposterism and distress across both doctoral students, PhD students and TCPs. While not unique to a certain discipline of doctoral study, it appears likely that the general doctoral level of academia and its associated pressures provide a context for associations between IP and poorer psychological wellbeing to thrive.

Although imposter experiences may be common within demanding training environments, normalising their occurrence should be distinguished from minimising their potential impact. Some uncertainty regarding competence may be expected, and potentially useful during professional development, however the present findings indicate that greater imposterism was associated with higher anxiety and depression and lower self-esteem. This suggests that, at higher levels, imposter experiences may coexist with meaningful psychological distress. A useful distinction may therefore be between normalising self-doubt as an understandable feature of developing competence and

recognising when persistent imposter experiences become associated with poorer wellbeing or interfere with academic and professional functioning.

With respect to demographic factors, most variables, including ethnicity, year of training, prior professional experience, and disability status, did not show significant differences in IP levels. Although previous qualitative accounts have suggested that minoritised students may be especially vulnerable to IP due to structural inequities and stereotype threat (Husbands et al., 2025), no statistically significant group differences emerged in the current sample. Similarly, previous research has shown IP to decrease alongside increased professional experience (Urwin, 2018), a finding that was not corroborated in this study.

The lack of observed effects may reflect limited subgroup sizes, restricted statistical power, or the possibility that factors such as training culture, supervisory relationships, or personality traits exert a stronger influence on IP than demographics or personal background alone. This interpretation is supported by research suggesting that imposter experiences are shaped significantly by training context, relational validation, and self-evaluative style, rather than just by demographic background. For example, Crabtree (2024) reported that IP was strongly associated with 'uncomfortable' academic environments/cultures, while Berry et al., (2021) reported low supervisor warmth and low emotional attunement to be strongly associated with increased IP. At the individual level, maladaptive perfectionism and self-critical thinking styles have been repeatedly linked to higher imposter scores (e.g., Sheveleva et al., 2023; Pakozdy et al., 2024), suggesting that enduring patterns of self-evaluation may be more proximally related to IP than demographic characteristics alone. Further evaluation of IPs association with ethnicity, experience, disability and year of study should be conducted among other doctoral disciplines to help determine if their lack of association to IP is unique to TCPs or part of a wider pattern in academia.

Gender differences in IP were explored using both categorical (chi-square) and continuous (t-test) approaches. While an initial chi-square using the four-level CIP categories produced unstable cell sizes, the recoded two-level IP variable (few vs. elevated IP) allowed for a more reliable test. This analysis suggested that female trainees were somewhat more likely to report elevated IP compared with male trainees, although the effect size was small. The independent samples t-test on continuous CIP scores similarly

indicated no statistically significant gender difference, reinforcing that gender effects, if present, are subtle in this population.

Early formulations of the IP focused primarily on women, and a substantial body of subsequent research has reported higher levels of imposterism among female students and professionals. Within doctoral populations specifically, several studies have similarly found women to report greater imposter feelings than men (e.g., Kimball et al. 2021; Jostl et al., 2012; Slimi et al., 2024). However, this pattern is not universal. Crabtree et al. (2024), for example, found no significant gender differences in imposter scores among doctoral researchers and Bravata et al.'s (2020) large-scale systematic review concluded that while women were more likely than men to report higher imposterism, nearly half of the reviewed studies found no gender differences. Notably, Tigranyan et al. (2021), whose sample of doctoral-level psychology trainees is most closely aligned with the present study, also reported no significant gender differences in IP. Together, these findings suggest that although women are more often found to report elevated IP than men, gender effects are variable rather than deterministic and may be attenuated in certain disciplinary contexts. It is therefore possible that features of psychology training may reduce or equalise gender differences in imposter experiences. This highlights the need for further research examining gender and imposterism within discipline-specific professional training pathways, rather than assuming that patterns observed in mixed academic samples generalise to clinical psychology training.

A central aim of the study was to test whether perfectionist cognitions moderated the association between IP and wellbeing outcomes, given conceptual similarities between IP and perfectionism, including similar cognitive distortions regarding self-criticism, unrealistic goals and overgeneralising mistakes (Thompson et al., 2000). Across models predicting depression and anxiety, centred CIP and PCI scores were used to reduce multicollinearity and to allow for interpretation of interaction terms at the mean level of the predictors.

Both IP and perfectionist cognitions were significant independent predictors of higher anxiety. However, for depression, perfectionist cognitions emerged as a significant predictor, whereas IP did not independently predict depressive symptoms once PCI was included in the model. The fact that IP correlated with depression bivariately, but not

uniquely when accounting for perfectionism, suggests that the section of IP's construct that overlaps with perfectionist thinking may be what is most relevant for depressive symptoms. The high salience of perfectionism when considering depression has been reinforced within a meta-analyses by Smith et al. (2021), who found perfectionism to be a significant vulnerability factor for depression across longitudinal studies. The current's study's findings support the notion that the perfectionist overlap with IP is particularly important when considering depression outcomes.

Across both anxiety and depression, the interaction between IP and PCI was not statistically significant. This suggests that, within this trainee group, perfectionist cognitions do not magnify or buffer the relationship between IP and anxiety or depression; instead, the constructs appear to exert additive effects on anxiety, while perfectionistic cognitions appear more centrally related to depressive symptoms.

The absence of a moderation effect in the present study also reflects the complex nature of the relationship between imposterism, perfectionism, and wellbeing observed in the wider literature. For example, Sheveleva et al. (2023) found that maladaptive perfectionism partially mediated the association between IP and distress in a university student sample, suggesting that perfectionism may be one pathway through which imposter feelings affect wellbeing. In contrast, Pakozdy et al. (2024) reported that the relationship between perfectionism and happiness was fully mediated by IP, indicating the reverse ordering in which imposterism functions as the more proximal driver of emotional outcomes. Together, these findings suggest that the causal and temporal ordering between imposterism, perfectionism, and wellbeing is not yet theoretically settled. Within this context, the present findings are consistent with a model in which imposterism and perfectionistic cognitions operate in parallel with respect to anxiety, while perfectionistic cognitions appear to account for variance in depressive symptoms beyond imposterism. Further longitudinal and process-focused research is needed to clarify how these constructs interact over time and to determine whether one reliably precedes or maintains the other in university populations.

4.2 Limitations and future directions

Several limitations should be acknowledged. First, although the sample size was adequate for correlational analyses, some demographic groups (such as minoritised ethnic categories and non-binary gender identities) were small, reducing statistical power and preventing more nuanced comparisons. Relatedly, collapsing variable categories for analyses (such as simplifying CIP categories to few vs elevated characteristics) while necessary for assumption checking, limits the interpretability of subgroup differences. Second, all measures were self-report, which may be influenced by social desirability or response biases, particularly given the professional context of clinical training in which respondents may wish to appear more confident.

Furthermore, the demographic variables examined within the current study were selected primarily for their relevance to the clinical psychology training context, including gender, ethnicity, disability, previous psychology experience, number of training applications and stage of training. However, this focus meant that potentially relevant aspects of participants' broader educational and socioeconomic backgrounds were not captured. For example, first-generation or first-in-family university status has been associated with differences in students' experiences and adjustment within higher education, including academic performance, persistence and experiences of social and institutional support (López et al., 2023). Socioeconomic or social-class background may similarly be relevant to experiences of access and belonging within higher education (Álvarez-Rivadulla et al., 2022). As these factors were not measured, the current study cannot determine whether they were associated with imposter experiences within TCPs. Future research should therefore consider a broader range of educational and socioeconomic characteristics when examining individual differences in IP within clinical psychology and other doctoral populations.

Additionally, future research could attempt to employ larger, more diverse trainee samples to investigate demographic disparities with sufficient statistical precision. Longitudinal or experience-sampling designs may be useful areas of further research to clarify whether perfectionist cognitions amplify imposter feelings during particularly stressful training periods, such placement transitions, submission deadlines or viva preparation. Additionally, qualitative work could help identify contextual contributors,

such as supervisory dynamics, assessment pressures, or imposter-normalising conversations within cohorts that are not captured by quantitative measures. Intervention research examining self-compassion, cognitive restructuring, or reflective practice groups may also support the development of frameworks for reducing IP-related distress among trainee clinical psychologists.

Moreover, future research should more directly examine the temporal ordering and mediating relationships between IP and perfectionistic thinking in TCPs. Longitudinal designs following applicants into training could help clarify whether clinical psychology disproportionately attracts individuals with high levels of perfectionism or imposterism, or whether these cognitive styles intensify in response to the demands and evaluative culture of training. Understanding whether these vulnerabilities precede entry into the profession, or emerge as a consequence of training experiences, would have important implications for both selection processes and early preventative interventions. The relationship between IP, self-evaluation and the development of professional competency may also represent a relevant area for future research, particularly given the ongoing evaluation of developing competence throughout clinical psychology training.

5. Conclusion

Overall, the findings highlight a clinically meaningful pattern of substantial IP among UK TCPs, which is associated with higher levels of depression and anxiety and lower self-esteem. These results underscore the importance of fostering supervisory, institutional, and training environments that explicitly acknowledge self-doubt, normalise the challenges of developing professional competence and support trainees in managing the cognitive and emotional patterns that contribute to distress. Furthermore, the present findings suggest that IP and perfectionist cognitions, while closely related, may function as partly distinct vulnerability processes rather than forming a single interactive pathway. For anxiety, both IP and perfectionistic cognitions were independently associated with poorer wellbeing, whereas for depression, perfectionistic cognitions remained uniquely associated once imposter feelings were accounted for. Perfectionism did not moderate the relationship between imposter feelings and anxiety or depression, aligning with emerging evidence that the ordering and mechanisms linking these constructs remain complex and not yet fully specified.

In addition, the lack of strong associations between IP and demographic or training-pathway variables, including gender, ethnicity, disability status, stage of training, and number of application attempts, highlights the possibility that how trainees experience and appraise their training environment may be more important than who they are or how they entered the profession. Together, these findings point to the need for future longitudinal and process-focused research to clarify how imposterism and perfectionistic thinking develop over time, whether they precede entry into clinical psychology training, or are amplified by its demands and how training cultures and supervisory relationships can be optimised to protect trainee wellbeing.

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Chapter Five – Discussion and Critical Evaluation

Overview of the thesis portfolio

This thesis portfolio explored Imposter Phenomenon (IP) within doctoral-level training contexts through two studies: a systematic review examining maladaptive associations of IP among doctoral and PhD students, and a quantitative empirical study investigating the relationship between IP, perfectionist cognitions, and wellbeing in UK TCPs.

The portfolio aimed to contribute to the understanding of IP within high-achievement training environments, while also examining how cognitive self-evaluation processes, particularly perfectionist cognitions, relate to trainee wellbeing. Across both studies, IP emerged as highly prevalent and meaningfully associated with psychological distress and self-critical patterns of thinking. The convergence of findings across doctoral populations broadly (systematic review) and a specific professional doctoral population (empirical study) strengthens confidence in the interpretation that IP is not isolated to particular disciplines but may represent a common feature of doctoral-level training environments (Berry et al., 2021; Crabtree, 2024).

Systematic review and empirical findings

The systematic review demonstrated consistent associations between IP and psychological distress, including depression, anxiety, emotional exhaustion, and reduced wellbeing among doctoral students (Berry et al., 2021; Pervez et al., 2021; Batchelder, 2019; Tigranyan et al., 2021). It also highlighted a recurring internalising psychological profile characterised by perfectionism, low self-esteem, reduced self-compassion, rumination, and avoidance (Berry et al., 2021; Gross et al., 2024; Tigranyan et al., 2021), alongside relational influences such as supervisory relationships, the sense of belonging, and institutional climate (Byrom et al., 2022; Slimi et al., 2024; Hogg, 2023).

The empirical study extended these findings into the context of UK clinical psychology training. Consistent with doctoral-level research, IP was found to be highly prevalent among TCPs and significantly correlated with depression, anxiety, and low self-esteem. These findings align with previous doctoral research demonstrating that imposter experiences are closely linked to internalising psychological distress and self-evaluative vulnerability (Pervez et al., 2021; Tao & Gloria, 2019; Nori & Vanttaja, 2023).

The empirical study also provided quantitative evidence of a strong association between IP and perfectionist cognitions, reinforcing the observation from the systematic review that perfectionism is a recurring correlate of IP in doctoral populations (Berry et al., 2021; Tigranyan et al., 2021). However, moderation analyses suggested that perfectionist cognitions did not significantly alter the relationship between IP and wellbeing outcomes, indicating that perfectionism and imposterism may function as related but distinct vulnerability processes.

This finding adds nuance to the literature synthesised in the systematic review. While perfectionism and IP frequently co-occur (Berry et al., 2021; Tigranyan et al., 2021), the empirical results suggest that perfectionistic thinking may operate alongside IP rather than amplifying the impact on distress. This interpretation is consistent with emerging evidence that the causal ordering and interaction between perfectionism and IP remain theoretically unresolved (Sheveleva et al., 2023; Pakozdy et al., 2024).

Together, the systematic review and empirical study suggest that IP in doctoral and professional training contexts may be understood as part of a broader underlying self-evaluative vulnerability that interacts with training environments characterised by evaluation, responsibility, and identity development (Byrom et al., 2022; Berry et al., 2021), as exemplified by these programmes.

Strengths of the research portfolio

A key strength of this thesis portfolio is the use of complementary methodologies to investigate IP across doctoral training contexts. The systematic review provided a structured synthesis of existing research on maladaptive associations of IP among doctoral and PhD students, while the empirical study generated new quantitative evidence within a specific professional doctoral population of UK TCPs. This combination of evidence synthesis and original data collection allowed the research to move beyond documenting associations in the literature toward testing theoretically relevant relationships within a defined training context.

The systematic review followed a transparent and structured approach to evidence identification and synthesis, including predefined inclusion criteria, systematic database searches, and reporting aligned with PRISMA guidance (Page et al., 2021). The use of the

Mixed Methods Appraisal Tool (MMAT; Hong et al., 2018) enabled methodological quality to be considered across diverse study designs, which was particularly appropriate given the inclusion of quantitative, qualitative, and mixed-methods studies. Incorporating a second reviewer in the screening process and quality appraisal of a subset of full text papers further strengthened the reliability of the review process.

Another strength of the review lies in its focus on a relatively under-researched population. Although IP has been widely studied in undergraduate and professional samples (Bravata et al., 2020), doctoral students have received comparatively less focused review synthesis despite evidence that they experience elevated psychological distress associated with their academic status (Levecque et al., 2017; Evans et al., 2018). By synthesising evidence across disciplines and international contexts, the review contributes to a clearer understanding of IP as a recurring feature of doctoral-level education.

The empirical study similarly contributes novel data regarding IP and perfectionist cognitions among UK TCPs. To date, research within this population has been largely qualitative (Jones & Thompson, 2017; Taylor, 2022; Tazzini, 2023), and the present study adds quantitative evidence regarding prevalence and psychological correlates of imposter experiences in this group. The use of well-established psychometric measures, including the Clance Imposter Phenomenon Scale (Clance, 1985), Perfectionistic Cognitions Inventory (Flett et al., 1998), PHQ-9 (Kroenke et al., 2001), GAD-7 (Spitzer et al., 2006), and Rosenberg Self-Esteem Scale (Rosenberg, 1965), strengthens confidence in the reliability and comparability of the findings.

A further strength of the empirical study is the relatively large trainee sample for this population (n = 157), which allowed for examination of IP prevalence, correlational relationships, and moderation analyses. Recruiting trainees from multiple UK training programmes helped capture a broader representation of the trainee population than single-programme studies and suggests findings are not specific to one university context. The inclusion of training-pathway variables such as years of experience and application attempts also extends the literature by exploring factors that have received little prior empirical attention in relation to IP.

At a conceptual level, the thesis portfolio is strengthened by its integration of psychological and contextual perspectives on IP. The systematic review highlighted IP related to both cognitive and emotional process and a relationally shaped experience within academic environments, while the empirical study examined cognitive processes through perfectionist cognitions, alongside emotional wellbeing outcomes (anxiety, depression, self-esteem). Together, these approaches support a more holistic understanding of IP within doctoral and professional training contexts.

Limitations of the research portfolio

Despite the strengths of the portfolio, several limitations should be considered when interpreting the findings across both the systematic review and empirical study.

One overarching limitation concerns the cross-sectional nature of the available evidence base. The studies included in the systematic review were predominantly cross-sectional and the empirical study similarly relied on a cross-sectional survey design. As a result, causal relationships between IP, perfectionist cognitions, and psychological wellbeing cannot be established. Although IP was consistently associated with depression, anxiety, and reduced self-esteem across doctoral samples (Berry et al., 2021; Pervez et al., 2021; Tigranyan et al., 2021), it remains unclear whether imposter experiences contribute to psychological distress, whether distress increases vulnerability to imposter beliefs, or whether both are shaped by shared cognitive or contextual factors. This limitation reflects a broader issue within IP research, where longitudinal and process-focused studies remain relatively scarce.

A second limitation concerns the reliance on self-report measures across both studies. The systematic review included studies that primarily measured IP, mental health, and related constructs using self-report questionnaires, and the empirical study similarly relied on self-report psychometric instruments. While validated measures were used, including the Clance Imposter Phenomenon Scale (Clance, 1985) and the Perfectionistic Cognitions Inventory (Flett et al., 1998), self-report designs introduce the possibility of common method variance and response bias (Johnson et al., 2011; Van de Mortel, 2008). In professional training populations, there may also be pressures to present oneself as competent or resilient, which could influence responses.

Sampling considerations also represent an important limitation. In the empirical study, recruitment relied on voluntary participation through programme dissemination and social media advertisement. This approach may have introduced self-selection bias, as trainees experiencing more salient imposter feelings or psychological distress may have been more motivated to participate. Conversely, trainees experiencing higher workload or distress may have been less likely to engage with research participation opportunities. As such, the prevalence estimates reported in the empirical study should be interpreted with caution.

Relatedly, although the empirical sample size was adequate for correlational and moderation analyses, some subgroup analyses were limited by small group sizes, particularly for minoritised ethnic groups, non-binary gender identities, and certain training-background categories. This reduced statistical power to detect group differences and required simplification of some variables for analysis (e.g. integrating multiple CIP score categories for chi-square testing). The absence of significant demographic effects in the empirical study may therefore reflect limited statistical power rather than true absence of differences.

There are also limitations associated with the systematic review methodology. Although the narrative synthesis approach was appropriate given the heterogeneity of study designs, measures, and outcomes, narrative synthesis is inherently interpretative and may be influenced by researcher judgement. While steps were taken to enhance transparency, including the use of PRISMA guidance (Page et al., 2021), predefined extraction templates, and MMAT appraisal (Hong et al., 2018), the synthesis was primarily conducted by a single reviewer. Although a second reviewer contributed to screening and appraisal reliability, the interpretative nature of narrative synthesis remains a limitation.

Another limitation concerns the scope of the evidence base included in the systematic review. The review was dominated by studies conducted in the United States and the United Kingdom, with fewer studies from non-Western doctoral systems, though this reflected the research currently available. Additionally, most included studies were quantitative and relied on similar IP measures (particularly the CIPS; Clance, 1985), which may limit the diversity of conceptualisations captured. These patterns reflect the current

state of the literature but constrain the generalisability of conclusions across doctoral education systems globally.

Finally, at the portfolio level, the research focused primarily on associations between IP, perfectionist cognitions, and wellbeing, rather than examining relational or institutional variables directly within the empirical study. Although the systematic review highlighted supervisory relationships, belongingness, and academic climate as important contextual influences on IP (Byrom et al., 2022; Slimi et al., 2024; Hogg, 2023), these factors were not measured quantitatively within the trainee sample. As a result, the empirical study provides insight into cognitive and emotional correlates of IP in TCPs but does not directly test all contextual processes identified in the review.

Methodological reflection and alternative approaches

The methodological approach adopted across the portfolio reflects both the aims of the research and practical constraints associated with doctoral-level projects. The use of a systematic review alongside a quantitative empirical study allowed the research to examine IP across both the existing literature and in a defined trainee population. Together, these components provide complementary perspectives, with the systematic review synthesising evidence on maladaptive associations of IP in broad doctoral/PhD student samples and the empirical study examining related processes specifically within UK TCPs. This combined approach enabled the portfolio to contribute both broader understanding and population-specific evidence within the context of clinical psychology training.

Within the systematic review, narrative synthesis was selected due to the heterogeneity of the available literature. The included studies varied substantially in methodology, population characteristics, disciplinary context, associated measures used and to a lesser degree, measurement of IP. Under these conditions, meta-analysis would not have been appropriate, as assumptions of conceptual and methodological comparability were not met (Popay et al., 2006). Narrative synthesis allowed patterns to be identified across quantitative, qualitative, and mixed-methods studies, supporting a broader contemporary account of imposter experiences in doctoral and PhD students.

However, narrative synthesis necessarily involves interpretative judgement in organising and grouping findings. An alternative approach could have been to restrict inclusion criteria to quantitative studies using comparable measures of IP and wellbeing in order to conduct a meta-analysis. While this may have allowed estimation of pooled effect sizes, it would have excluded qualitative and mixed-methods studies that contributed important contextual insights regarding supervisory relationships, belonging, and academic identity development. The decision to retain methodological breadth enabled the opportunity for more nuanced understanding over statistical aggregation.

In the empirical study, a cross-sectional survey design was chosen to examine prevalence and associations between IP, perfectionist cognitions, and wellbeing among TCPs. This approach allowed recruitment across multiple UK training programmes and enabled the use of validated psychometric measures to investigate relationships between constructs. Given the exploratory nature of examining perfectionist cognitions as a potential moderator of the relationship between IP and wellbeing in this population, a cross-sectional design provided an efficient and feasible method for initial investigation.

Nevertheless, alternative methodological approaches could have addressed some limitations of the current study. For example, longitudinal designs could examine how IP and perfectionist cognitions develop across stages of clinical psychology training, or whether these variables change during periods of heightened evaluation such as placement transitions or thesis submission. Experience-sampling or diary-based methods could also capture fluctuations in imposter thoughts and perfectionistic thinking in response to training-related events. Such approaches may provide richer insight into the dynamics of imposter experiences over time than cross-sectional data.

Another methodological consideration relates to the measurement of perfectionism. The present study used the Perfectionistic Cognitions Inventory (PCI; Flett et al., 1998), which captures the frequency of perfectionistic thoughts rather than trait perfectionism. This choice aligned with the study's interest in cognitive processes. However, alternative measures such as the Frost Multidimensional Perfectionism Scale (Frost et al., 1990) or Hewitt and Flett's multidimensional perfectionism model (Hewitt & Flett, 1991) could have provided insight into more stable perfectionism dimensions. Including both cognitive and trait measures of perfectionism may have allowed examination of whether enduring

perfectionism tendencies or context-dependent perfectionistic thoughts are more strongly associated with imposter experiences.

Recruitment strategy also shaped the methodology of the empirical study. Participants were recruited through programme dissemination emails and social media, enabling access to trainees across multiple institutions. While this approach supported broader reach, an alternative strategy could have involved deeper independent programme-level collaboration with specific course directors, which may have increased participation rates and improved representation across demographic groups. However, this would likely have required a significantly longer period of collaboration and recruitment. Similarly, including trainees from the researcher's own training programme might have increased sample size, although this was not pursued in order to minimise potential dual-role and confidentiality concerns.

Finally, the portfolio focused primarily on individual psychological variables, despite the systematic review highlighting the importance of relational and institutional factors in imposter experiences. An alternative empirical design could have incorporated measures of supervisory relationship quality, belongingness, training climate, or perceived organisational support. Including such variables may have allowed more direct testing of the interaction between cognitive self-evaluation processes and training context suggested by the systematic review findings.

Implications for theory

Taken together, the findings of the systematic review and empirical study contribute to the conceptualisation of IP as a multifaceted psychological experience shaped by both self-evaluative cognitions and training environments. Across the systematic review, IP consistently clustered with internalising psychological processes, including perfectionism, low self-esteem, reduced self-compassion, rumination, and anxiety (Berry et al., 2021; Tigranyan et al., 2021; Gross et al., 2024). The empirical study similarly demonstrated associations between IP, depression, anxiety, and self-esteem among TCPs, reinforcing the interpretation that IP is associated with poorer wellbeing in professional doctorate students.

These findings support theoretical accounts that frame IP not simply as inaccurate self-appraisal of competence, but as part of a broader pattern of self-critical cognitive and emotional processing (Clance, 1985; Kolligian & Sternberg, 1991). Within this framework, IP may be understood as reflecting how individuals interpret performance-related experiences, feedback and success, rather than objective ability or achievement. This interpretation is consistent with attribution-based explanations of IP, which suggest that individuals experiencing imposterism tend to attribute success to external or unstable factors while internalising perceived failure (Thompson et al., 1998).

The portfolio findings also contribute to theoretical understanding of the relationship between perfectionism and IP. The systematic review identified perfectionism as one of the most consistent correlates of imposter experiences in doctoral students, and the empirical study demonstrated a strong correlation between IP and perfectionist cognitions. However, moderation analyses suggested that perfectionist cognitions did not significantly alter the relationship between IP and psychological distress. This pattern indicates that perfectionism and IP may represent related but partially independent processes, rather than components of a single unified construct.

A further nuance emerging from the empirical findings concerns the relationship between IP, perfectionist cognitions, and depressive symptoms. Although IP was significantly associated with depression at the correlational level, it did not uniquely predict depressive symptoms when perfectionist cognitions were included in the regression model. As such, perfectionist cognitions accounted for much of the association between IP and increased depression.

In contrast, perfectionist cognitions remained a significant predictor of depression even when accounting for IP. These findings suggest that perfectionistic cognitions may explain depressive symptoms more robustly than imposter beliefs, or that the association between imposter experiences and depression reflects shared variance with perfectionism. This interpretation accords with models framing perfectionism as a maladaptive cognitive process linked to depression, with imposter experiences representing a closely related cognitive pattern. This aligns with emerging literature suggesting that the relationship between perfectionism, IP, and wellbeing may involve multiple possible pathways, including mediation, shared vulnerability processes, or

parallel contributions to distress (Sheveleva et al., 2023; Pakozdy et al., 2024). The absence of moderation in the present study therefore contributes to ongoing theoretical uncertainty regarding how perfectionistic thinking and imposter experiences interact over time.

Another theoretical implication concerns the role of context in imposter experiences. The systematic review highlighted relational and institutional influences on IP, including supervisory relationships, belongingness, and perceived academic climate. When considered alongside the empirical findings in TCPs, this suggests that IP may be understood as emerging from the interaction between individual cognitive vulnerabilities and doctoral training, or similarly high pressure, environments. Such an interpretation moves beyond personal individual differences in IP, towards a more relational and contextual understanding of imposter experiences.

Clinical and training implications

The findings of this portfolio have several implications for clinical psychology training and trainee wellbeing. In both the systematic review and empirical study, IP was consistently associated with psychological distress and self-critical patterns of thinking, suggesting that imposter experiences may represent a meaningful vulnerability within doctoral and professional training environments.

In UK clinical psychology training specifically, the empirical findings indicate that IP is highly prevalent and associated with depression, anxiety, and reduced self-esteem among trainees. These findings, alongside qualitative research highlighting themes of perfectionism, competitiveness, burnout, and self-criticism in UK TCP experiences (Jones & Thompson, 2017; Taylor, 2022; Tazzini, 2023) suggest that imposter-related processes may be relevant to trainee wellbeing and professional development. Recognising imposter experiences as a common aspect of training may therefore support more open discussion of self-doubt within training programmes.

One implication concerns the role of supervision and reflective practice. The systematic review highlighted supervisory relationships, belongingness, and perceived academic support as important contextual factors associated with IP in doctoral students (Byrom et al., 2022; Slimi et al., 2024). Within clinical psychology training, supervision provides a key

relational space in which trainees reflect on competence, uncertainty, and professional identity development. Creating supervisory environments that normalise uncertainty, support reflective learning, and explicitly address self-critical thinking may help reduce the distress associated with IP.

The findings also suggest potential relevance for wellbeing and support initiatives within training programmes. The empirical study indicated that both IP and perfectionist cognitions were independently associated with anxiety. This suggests that training programmes may benefit from supporting trainees not only in developing clinical competence, but also in recognising and managing cognitive patterns such as perfectionistic thinking and self-criticism. Reflective practice groups, wellbeing teaching, and collaborative and compassionate supervision may provide opportunities to address these processes.

Another implication concerns how training cultures conceptualise competence and development. Doctoral and professional training programmes often involve repeated evaluation, high expectations, and comparison with peers. While these structures are necessary for professional accountability, they may also unintentionally reinforce self-critical interpretations of performance. Encouraging developmental models of competence, in which uncertainty and learning are framed as expected aspects of professional growth, may help mitigate imposter-related distress.

Importantly, the absence of strong demographic or training-pathway predictors of IP in the empirical study (e.g. application attempts, years previous experience etc.) suggests that imposter experiences may be shaped more by training context and cognitive self-evaluation processes than by individual background characteristics alone. This supports the idea that interventions at the level of training culture, supervision, and reflective practice may be particularly relevant for supporting trainee wellbeing, regardless of a trainee's personal background, prior experience or application attempts.

More broadly, these findings contribute to growing recognition that professional training environments, particularly within healthcare, involve emotional and identity-related challenges alongside skill development. Addressing imposter experiences within training

may therefore support not only trainee wellbeing, but also professional confidence and workforce sustainability.

Future research

The findings of this portfolio highlight several directions for future research on IP in doctoral and professional training contexts.

First, there is a clear need for longitudinal research examining how imposter experiences develop and change over the course of doctoral and professional training. Both the systematic review and empirical study relied primarily on cross-sectional evidence, limiting conclusions about causal relationships between IP, perfectionist cognitions, and psychological wellbeing. Longitudinal designs following individuals from application, to training and into professional roles could help clarify whether imposter experiences precede psychological distress, emerge in response to training demands, or fluctuate across different stages of professional development. While studies have attempted to consider IP longitudinally over university courses (Houseknecht et al, 2019) or through an academic year (Doa et al., 2024), low participation rates and limited timeframes mean this is an area for ongoing research.

Furthermore, future research should aim to clarify mechanisms linking IP and perfectionistic thinking. The present study found that perfectionist cognitions and IP were strongly associated but did not interact to predict wellbeing outcomes. This suggests that these constructs may operate in related but distinct ways. Longitudinal or mediation-based designs could examine whether perfectionistic thinking contributes to the development or maintenance of IP, whether imposter beliefs reinforce perfectionistic cognition, or whether both arise from shared self-evaluative processes.

Another important direction for future research involves examining the role of training context more directly. As previously mentioned, the systemic review identified relational and institutional contexts, such as supervisor relationship to be associated with IP (Slimi et al., 2024), however these relational and institutional variables were not measured quantitatively in the empirical trainee sample. Future studies could incorporate measures of supervision quality, training culture, cohort belonging, and perceived evaluation

pressure to better understand how contextual factors interact with cognitive vulnerabilities to shape IP.

Further research is also needed specifically within clinical psychology training populations. Although qualitative research has explored trainee experiences of perfectionism, self-doubt, and burnout (Jones & Thompson, 2017; Taylor, 2022; Tazzini, 2023), quantitative research remains limited. Larger multi-cohort studies could provide more precise estimates of IP prevalence and allow investigation of demographic and training-related differences with even stronger statistical power. Organisations that outline professional guidance for UK clinical psychologists, manage course applications and survey trainees annually, such as the British Psychological Society and Clearing House for Clinical Psychology, might be best placed to gain larger quantitative data regarding IP within this cohort. Comparative studies across professional training programmes (e.g. medicine, nursing, or other psychological professions) may also help determine whether IP reflect features of clinical psychology training specifically or professional training more broadly.

Methodologically, future research may benefit from experience-sampling or diary-based approaches to capture fluctuations in imposter thoughts and perfectionistic cognitions during periods of evaluation or transition, such as placement changes, academic deadlines, or competency assessments. Such designs may help capture the dynamic nature of IP in ways that cross-sectional surveys cannot.

Finally, intervention-focused research may be valuable in translating the growing evidence base on IP into practice. Given the consistent association between IP, self-critical thinking, and psychological distress, future studies could explore whether approaches targeting self-compassion, cognitive restructuring, reflective practice, or supervision processes reduce imposter-related distress in trainee populations. For example, Siddique et al. (2024) conducted a scoping review of educational interventions for IP in healthcare, finding that workshops, group discussions and coaching were effective methods in helping to overcome IP. As the current thesis has outlined the prevalence in TCPs, researching these intervention methods within the TCP population would be a further area of interest.

Conclusion

This thesis portfolio examined IP within doctoral-level education and professional training, with a particular focus on its relationship with perfectionistic thinking and psychological wellbeing. Across both the systematic review and empirical study, IP emerged as a highly prevalent experience associated with psychological distress.

The systematic review highlighted consistent links between IP in doctoral-level students and depression, anxiety, perfectionism, reduced academic self-efficacy, and relational and institutional factors such as supervisory support and belongingness. The empirical study extended these findings to UK TCPs, demonstrating similarly high levels of IP and significant correlations with anxiety, depression, self-esteem, and perfectionist cognitions. Although perfectionist cognitions did not moderate the relationship between IP and wellbeing, IP and perfectionist cognitions were both independently correlated with anxiety, with perfectionist cognitions emerging as the stronger predictor of depressive symptoms. This suggests that the constructs may represent related, but partially distinct, vulnerabilities to lower wellbeing.

Overall, the portfolio contributes to understanding IP as a self-critical and contextually shaped experience within doctoral and professional training environments. These findings highlight the importance of continued research examining how IP develops over time and how training environments can support individuals navigating their professional development and learning within demanding educational and clinical contexts.

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Appendices

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Appendix A

Author guidelines for Frontiers in Psychology

Article Types

Original Research

Original Research articles report on primary and unpublished studies. Original Research may also encompass confirming studies and disconfirming results which allow hypothesis elimination, reformulation and/or report on the non-reproducibility of previously published results. Original Research articles are peer-reviewed and have a maximum word count of 12,000. Authors are required to pay a fee (A-type article) to publish an Original Research article. Original Research articles should have the following format:

1. Abstract
2. Introduction
3. Materials and Methods
4. Results
5. Discussion

Systematic Review

Systematic Review articles present a synthesis of previous research, and use clearly defined methods to identify, categorize, analyze and report aggregated evidence on a specific topic. Included in this article type are meta-syntheses, meta-analyses, mapping reviews, scoping reviews, systematic reviews, and systematic reviews with a meta-analysis. Systematic Review articles are peer-reviewed and have a maximum word count of 12,000. Authors are required to pay a fee (A-type article) to publish a Systematic Review article. Systematic Reviews should: clearly define the research question in terms of population, interventions, comparators, outcomes and study designs (PICOS), and state which reporting guidelines were used in the study. For design and reporting, systematic reviews must conform to the reporting guidelines (e.g., PRISMA, Cochrane, Campbell), and include the PRISMA flow diagram **http://prisma-statement.org/prismastatement/flowdiagram.aspx** (if applicable), as well as funding information (if no specific funding to carry out the research, please state so). Systematic Reviews should have the following format:

1. Abstract
2. Introduction

3. Methods (including study design; participants; interventions; comparators; systematic review protocol; search strategy; data sources; study sections and data extraction; data analysis)
4. Results (including a flow diagram of the studies retrieved for the review; study selection and characteristics; synthesized findings; assessment of risk of bias)
5. Discussion (including summary of main findings; limitations; conclusions)

Systematic Reviews must not include unpublished material (unpublished/original data, submitted manuscripts, or personal communications) and may be rejected in review or reclassified, at a significant delay, if found to include such content.

Guidelines for authors

Writing and formatting

Title

The title should be concise, omitting terms that are implicit and, where possible, be a statement of the main result or conclusion presented in the manuscript. Abbreviations should be avoided within the title.

Witty and creative titles are welcome, but only if relevant and within measure. Consider if a title meant to be thought-provoking might be misinterpreted as offensive or alarming. In extreme cases, the editorial office may veto a title and propose an alternative. Authors should avoid:

- titles that are a mere question without giving the answer
- unambitious titles, for example starting with 'Towards,' 'A description of,' 'A characterization of' or 'Preliminary study on'
- vague titles, for example starting with 'Role of', 'Link between', or 'Effect of' that do not specify the role, link, or effect
- including terms that are out of place, for example the taxonomic affiliation apart from species name.

Abstract

As a primary goal, the abstract should make the general significance and conceptual advance of the work clearly accessible to a broad readership. The abstract should be no longer than a single paragraph and should be structured, for example, according to the **IMRAD format**. For the specific structure of the abstract, authors should follow the requirements of the article type or journal to which they're submitting. Minimize the use of abbreviations and do not cite references, figures or tables. For clinical trial articles,

please include the unique identifier and the URL of the publicly accessible website on which the trial is registered.

Manuscript length

Frontiers encourages the authors to closely follow the article word count lengths given in the 'Article types' page of the journals. The manuscript length includes only the main body of the text, footnotes, and all citations within it, and excludes the abstract, section titles, figure and table captions, funding statement, acknowledgments, and references in the bibliography. Please indicate the number of words and the number of figures and tables included in your manuscript on the first page.

Sections

The manuscript is organized by headings and subheadings. The section headings should be those appropriate for your field and the research itself. You may insert up to 5 heading levels into your manuscript (i.e 3.2.2.1.2 Heading Title).

For Original Research articles, it is recommended to organize your manuscript in the following sections or their equivalents for your field.

Introduction

Materials and methods This section may be divided by subheadings and should contain sufficient detail so that when read in conjunction with cited references, all procedures can be repeated. For experiments reporting results on animal or human subject research, an ethics approval statement should be included in this section (for further information, see the 'Bioethics' section of our **policies and publication ethics**.)

Results This section may be divided by subheadings. Footnotes should not be used and must be transferred to the main text.

Discussion This section may be divided by subheadings. Discussions should cover the key findings of the study: discuss any prior research related to the subject to place the novelty of the discovery in the appropriate context, discuss the potential shortcomings and limitations on their interpretations, discuss their integration into the current understanding of the problem and how this advances the current views, speculate on the future direction of the research, and freely postulate theories that could be tested in the future.

For further information, please check the descriptions defined in the journal's 'Article types' page, in the 'For authors' menu on every journal page.

Templates

If working with Word please use our **Word templates**. If you wish to submit your article as LaTeX, we recommend our **LaTeX templates**. For LaTeX files, please ensure all relevant

manuscript files are uploaded: .tex file, PDF, and .bib file (if the bibliography is not already included in the .tex file).

During the **interactive review**, authors are encouraged to upload versions using track changes. Editors and reviewers can only download the PDF file of the submitted manuscript.

Language editing

Frontiers requires manuscripts submitted to meet international English language standards to be considered for publication.

For authors who would like their manuscript to receive language editing or proofreading to improve the clarity of the manuscript and help highlight their research, Frontiers recommends the language-editing services provided by the following external partners.

Note that sending your manuscript for language editing does not imply or guarantee that it will be accepted for publication by a Frontiers journal. Editorial decisions on the scientific content of a manuscript are independent of whether it has received language editing or proofreading by these partner services or other services.

Editage We recommend the language-editing service provided by our external partner Editage to authors who believe their manuscripts would benefit from professional editing. These services may be particularly useful for researchers for whom English is not the primary language. They can help to improve the grammar, syntax, and flow of your manuscript prior to submission. Frontiers' authors will receive a 10% discount using this link: **editage.com/frontiers**.

The Charlesworth Group We recommend the Charlesworth Group's author services, with a long-standing track record in language editing and proofreading. This is a third-party service for which Frontiers' authors will receive a 10% discount using this link: **www.cwauthors.com/frontiers**.

Language style

The default language style at Frontiers is American English. If you prefer your article to be formatted in British English, please specify this on the first page of your manuscript. For any questions regarding style, Frontiers recommends authors to consult the **Chicago Manual of Style**.

Inclusive language

Frontiers is an inclusive publisher and we ask that all submissions are in line with our inclusive language policy. When preparing your manuscript for submission, take a mindful approach towards personal biases and a concerted effort to limit their influence. Authors should remove any suggestion or implication of superiority or inferiority of one person over another based on age, gender, race, ethnicity, culture, sexual orientation, disability,

religion, or socio-economic class. We ask authors to use inclusive language practices and awareness of diversity, equity, and inclusion into their research and keep it at the forefront during the composition of their findings.

External guidance that may be useful is available at C4DISC's **Guidelines on Inclusive Language and Images in Scholarly Communication**.

Furthermore, when drafting your work, please take into account the following considerations

In general, seek to avoid:

- language that could be deemed insulting, profane, or derogatory.
- descriptors that identify personal attributes such as age, gender, race, ethnicity, culture, sexual orientation, disability, or health conditions, where they are not critically relevant to the discussion.
- any form of language that suggests a particular culture or group as the default or standard.

And where feasible:

- proactively ask individuals or groups how they would prefer to be referenced.
- adhere to the SAGER guidelines for reference to sex and gender in research.

Remember, the language we use can influence perceptions, evoke emotions, and shape perspectives. Let's work together to nurture an inclusive, respectful, and empowering discourse in science.

Search engine optimization

There are a few simple ways to maximize your article's discoverability and search results.

- Include a few of your article's keywords in the title of the article
- Do not use long article titles
- Pick 5-8 keywords using a mix of generic and more specific terms on the article subject(s)
- Use the maximum amount of keywords in the first two sentences of the abstract
- Use some of the keywords in level 1 headings

Alt text

As part of our commitment to make science open for all, we are dedicated to accessibility in our publications. One way you can make your manuscript more accessible is by including alternative text (alt text) with all figures or images.

What is alt text?

Alt text is a short visual description of the contents of an image. Alt text is not the same as a caption, as it provides a description of the entire image. It is included in the manuscript alongside the image, but in the background, not visible on the page.

Good alt text will be specific, concise, and not overly descriptive. It should include any essential text or data that appears on the image and would be lost if a user couldn't see it.

See Harvard University's guide for more **tips on writing good alt text**.

Why is alt text important?

It allows people using screen reading technology to clearly understand the contents of an image, therefore making your manuscript more accessible for readers with visual impairments. This is also useful for anyone else who can't view the image - if it doesn't load quickly, for instance.

Alt text can also provide better descriptions to search engine crawlers, helping with article discoverability and indexing.

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Guidelines for artificial intelligence

These guidelines cover acceptable uses of generative AI technologies such as Large Language Models (ChatGPT, Jasper) and text-to-image generators (DALL-E 2, Midjourney, Stable Diffusion) in the writing or editing of manuscripts submitted to Frontiers.

Use of AI to create written or visual content

Authors should not list a generative AI technology as a co-author or author of any submitted manuscript. Generative AI technologies cannot be held accountable for all aspects of a manuscript and consequently do not meet the criteria required for authorship.

If the author of a submitted manuscript has used written or visual content produced by or edited using a generative AI technology, this use must follow all Frontiers guidelines and policies. Specifically, the author is responsible for checking the factual accuracy of any content created by the generative AI technology. This includes, but is not limited to, any quotes, citations or references. Figures produced by or edited using a generative AI technology must be checked to ensure they accurately reflect the data presented in the manuscript. Authors must also check that any written or visual content produced by or edited using a generative AI technology is free from plagiarism.

If the author of a submitted manuscript has used written or visual content produced by or edited using a generative AI technology, such use must be acknowledged in the acknowledgements section of the manuscript and the methods section if applicable. This

explanation must list the name, version, model, and source of the generative AI technology. We encourage authors to upload all input prompts provided to a generative AI technology and outputs received from a generative AI technology in the supplementary files for the manuscript.

The entire document should be single-spaced and must contain page and line numbers in order to facilitate the review process. The manuscript should be written using either Word or LaTeX. See above for templates.

Abbreviations and nomenclature

The use of abbreviations should be kept to a minimum. Non-standard abbreviations should be avoided unless they appear at least four times, and must be defined upon first use in the main text. Consider also giving a list of non-standard abbreviations at the end, immediately before the acknowledgments.

Equations should be inserted in editable format from the equation editor.

Italicize gene symbols and use the approved gene nomenclature where it is available. For human genes, please refer to the HUGO Gene Nomenclature Committee (**HGNC**). New symbols for human genes should be submitted to the HGNC **here**. Common alternative gene aliases may also be reported, but should not be used alone in place of the HGNC symbol. Nomenclature committees for other species are listed **here**. Protein products are not italicized.

We encourage the use of Standard International Units in all manuscripts.

Chemical compounds and biomolecules should be referred to using systematic nomenclature, preferably using the recommendations by the International Union of Pure and Applied Chemistry (IUPAC).

Astronomical objects should be referred to using the nomenclature given by the International Astronomical Union (IAU) provided **here**.

Life Science Identifiers (LSIDs) for ZOOBANK registered names or nomenclatural acts should be listed in the manuscript before the keywords. An LSID is represented as a uniform resource name (URN) with the following format:
urn:lsid:<Authority>:<Namespace>:<ObjectID>[:<Version>]

For more information on LSIDs please see the 'Code' section of our **polices and publication ethics**.

References

Preparing and formatting references

Submissions to Frontiers must be grounded in relevant and up to date peer-reviewed, academic research, and this should be reflected in the accompanying reference lists.

Authors are welcome to use online referencing tools in preparation of their manuscript. Some useful resources include **RefMe**, **Zotero**, and **Mendeley**.

- The citation of non-academic and non-peer-reviewed sources (e.g. blog posts, website content), as well as anonymous sources or commercial websites should be avoided or kept to a minimum
- Authors should avoid citing content that is not directly relevant to the scope of the article and the journal
- Reference lists should reflect the current status of knowledge in the field, avoid bias, and not include a high proportion of citations to the same authors or sources, school of thought, etc.
- The length of the reference list should be appropriate depending on the article type, covering the relevant literature through sufficient referencing
- Authors should ensure that references are accurate, that all links are accessible, and that the citations/references adhere to the reference styles outlined below

Frontiers' journals use one of two reference styles, either Harvard (author-date) or Vancouver (numbered). Please check our **help center** to find the correct style for the journal to which you are submitting.

- All citations in the text, figures or tables must be in the reference list and vice-versa
- The names of the first six authors followed by et al. and the DOI (when available) should be provided
- Given names of authors should be abbreviated to initials (e.g., Smith, J., Lewis, C.S., etc.)
- The reference list should only include articles that are published or accepted
- Unpublished data, submitted manuscripts, or personal communications should be cited within the text only, for article types that allow such inclusions
- For accepted but unpublished works use 'in press' instead of page numbers
- Data sets that have been deposited to an online repository should be included in the reference list. Include the version and unique identifier when available
- Personal communications should be documented by a letter of permission
- Website URLs should be included as footnotes
- Any inclusion of verbatim text must be contained in quotation marks and clearly reference the original source

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Reference examples

Article in a print journal Sondheimer, N., and Lindquist, S. (2000). Rnq1: an epigenetic modifier of protein function in yeast. Mol. Cell. 5, 163-172.

Article in an online journal Tahimic, C.G.T., Wang, Y., Bikle, D.D. (2013). Anabolic effects of IGF-1 signaling on the skeleton. Front. Endocrinol. 4:6. doi: 10.3389/fendo.2013.00006

Article or chapter in a book Sorenson, P. W., and Caprio, J. C. (1998). "Chemoreception," in The Physiology of Fishes, ed. D. H. Evans (Boca Raton, FL: CRC Press), 375-405.

Book Cowan, W. M., Jessell, T. M., and Zipursky, S. L. (1997). Molecular and Cellular Approaches to Neural Development. New York: Oxford University Press.

Abstract Hendricks, J., Applebaum, R., and Kunkel, S. (2010). A world apart? Bridging the gap between theory and applied social gerontology. Gerontologist 50, 284-293. Abstract retrieved from Abstracts in Social Gerontology database. (Accession No. 50360869)

Website World Health Organization. (2018). E. coli. https://www.who.int/news-room/fact-sheets/detail/e-coli [Accessed March 15, 2018].

Patent Marshall, S. P. (2000). Method and apparatus for eye tracking and monitoring pupil dilation to evaluate cognitive activity. U.S. Patent No 6,090,051. Washington, DC: U.S. Patent and Trademark Office.

Data Perdiguero P, Venturas M, Cervera MT, Gil L, Collada C. Data from: Massive sequencing of Ulms minor's transcriptome provides new molecular tools for a genus under the constant threat of Dutch elm disease. Dryad Digital Repository. (2015) http://dx.doi.org/10.5061/dryad.ps837

Theses and dissertations Smith, J. (2008) Post-structuralist discourse relative to phenomological pursuits in the deconstructivist arena. [dissertation/master's thesis]. [Chicago (IL)]: University of Chicago

Preprint Smith, J. (2008). Title of the document. Preprint repository name [Preprint]. Available at: https://persistent-url (Accessed March 15, 2018).

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- References should be numbered and listed chronologically, according to the order they appear in the text

Reference examples

Article in a print journal Sondheimer N, Lindquist S. Rnq1: an epigenetic modifier of protein function in yeast. Mol Cell (2000) 5:163-72.

Article in an online journal Tahimic CGT, Wang Y, Bikle DD. Anabolic effects of IGF-1 signaling on the skeleton. Front Endocrinol (2013) 4:6. doi: 10.3389/fendo.2013.00006

Article or chapter in a book Sorenson PW, Caprio JC. "Chemoreception". In: Evans DH, editor. The Physiology of Fishes. Boca Raton, FL: CRC Press (1998). p. 375-405.

Book Cowan WM, Jessell TM, Zipursky SL. Molecular and Cellular Approaches to Neural Development. New York: Oxford University Press (1997). 345 p.

Abstract Christensen S, Oppacher F. An analysis of Koza's computational effort statistic for genetic programming. In: Foster JA, editor. Genetic Programming. EuroGP 2002: Proceedings of the 5th European Conference on Genetic Programming; 2002 Apr 3–5; Kinsdale, Ireland. Berlin: Springer (2002). p. 182–91.

Website World Health Organization. E. coli (2018). https://www.who.int/news-room/fact-sheets/detail/e-coli [Accessed March 15, 2018].

Patent Pagedas AC, inventor; Ancel Surgical R&D Inc., assignee. Flexible Endoscopic Grasping and Cutting Device and Positioning Tool Assembly. United States patent US 20020103498 (2002).

Data Perdiguero P, Venturas M, Cervera MT, Gil L, Collada C. Data from: Massive sequencing of Ulms minor's transcriptome provides new molecular tools for a genus under the constant threat of Dutch elm disease. Dryad Digital Repository. (2015) http://dx.doi.org/10.5061/dryad.ps837

Theses and dissertations

Smith, J. (2008) Post-structuralist discourse relative to phenomological pursuits in the deconstructivist arena. [dissertation/master’s thesis]. [Chicago (IL)]: University of Chicago

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Acknowledgments

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Appendix B

Mixed Methods Appraisal Tool (MMAT) and screening choices

Category of study designs	Methodological quality criteria	Responses			
		Yes	No	Can't tell	Comments
Screening questions (for all types)	S1. Are there clear research questions?				
	S2. Do the collected data allow to address the research questions?				
	Further appraisal may not be feasible or appropriate when the answer is 'No' or 'Can't tell' to one or both screening questions.				
1. Qualitative	1.1. Is the qualitative approach appropriate to answer the research question?				
	1.2. Are the qualitative data collection methods adequate to address the research question?				
	1.3. Are the findings adequately derived from the data?				
	1.4. Is the interpretation of results sufficiently substantiated by data?				
	1.5. Is there coherence between qualitative data sources, collection, analysis and interpretation?				
2. Quantitative randomized controlled trials	2.1. Is randomization appropriately performed?				
	2.2. Are the groups comparable at baseline?				
	2.3. Are there complete outcome data?				
	2.4. Are outcome assessors blinded to the intervention provided?				
	2.5 Did the participants adhere to the assigned intervention?				
3. Quantitative non-randomized	3.1. Are the participants representative of the target population?				
	3.2. Are measurements appropriate regarding both the outcome and intervention (or exposure)?				
	3.3. Are there complete outcome data?				
	3.4. Are the confounders accounted for in the design and analysis?				
	3.5. During the study period, is the intervention administered (or exposure occurred) as intended?				
4. Quantitative descriptive	4.1. Is the sampling strategy relevant to address the research question?				
	4.2. Is the sample representative of the target population?				
	4.3. Are the measurements appropriate?				
	4.4. Is the risk of nonresponse bias low?				
	4.5. Is the statistical analysis appropriate to answer the research question?				
5. Mixed methods	5.1. Is there an adequate rationale for using a mixed methods design to address the research question?				
	5.2. Are the different components of the study effectively integrated to answer the research question?				
	5.3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?				
	5.4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?				
	5.5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?				

Author and Country	Study design (MMAT category)	Screening Questions	C1	C2	C3	C4	C5
Nori, H., & Vanttaja, M. (2023).	Quantitative descriptive	✓✓	✓	✓	✓	✓	✓
Boyle et al. (2022).	Quantitative descriptive	✓✓	✓	✓	✓	✓	✓
Byrom et al. (2022).	Quantitative descriptive	✓✓	✓	✓	✓	✓	✓
Tao & Gloria (2018).	Quantitative descriptive	✓✓	✓ - Though recognised as limitation of the study only drawing from a single college.	✓	✓	✓	✓
Hogg (2023).	Quantitative descriptive	✓✓	✓ - Though recognised as limitation of the study only drawing from a	✓	✓	✓	✓

			single college.				
Kimball et al. (2021).	Quantitative descriptive	✓✓	✓ - Though recognised as limitation of the study only drawing from a single college.	✓	✓	✓	✓
Pervez et al. (2021).	Mixed methods	✓✓	✓	✓	✓	✓ - consistency between quantitative results and post-hoc qualitative interviews generally discussed but could benefit from more detail.	✓
Tigranyan et al. (2021).	Quantitative descriptive	✓✓	✓	✓	✓	? - potentially a risk of non-response bias given number of institutions contacted (35) vs number of total study sample (84).	✓

Craddock et al. (2011).	Qualitative	✓✓	✓	✓	✓	✓	✓
Kheang (2023).	Mixed methods	✓✓	✓	✓	✓	✓	✓
Jöstl et al. (2012). Austria	Quantitative descriptive	✓✓	? – Sample appears appropriate on face validity, but no detail is provided on sampling procedures.	✓	✓	? – Sampling procedure lacks detail, so number/risk of non-response bias is difficult to establish. However, the total sample is large so non-response bias is likely low.	✓
Kodweis et al. (2023).	Quantitative descriptive	✓✓	✓ - Though recognised as limitation of the study only drawing from a single college.	✓	✓	✓	✓
Batchelder (2019).	Quantitative descriptive	✓✓	✓	✓	✓	✓	✓

Petruzziello et al. (2025).	Mixed methods	✓✓	✓	✓	✓	✓	✓
Slimi et al. (2024).	Quantitative descriptive	✓✓	✓	✓	✓	✓	✓
Gross et al. (2024).	Quantitative descriptive	✓✓	✓	✓	✓	✓	✓
Berry et al. (2021).	Quantitative descriptive	✓✓	✓	✓	✓	✓	✓
Crabtree (2024).	Quantitative descriptive	✓✓	✓	✓	✓	✓	✓
Bano & O'Shea (2023).	Qualitative	✓✓	✓	✓	✓	✓	✓
Young et al. (2024).	Quantitative descriptive	✓✓	✓	✓	✓	✓	✓

Appendix C

Illustrative examples of narrative synthesis process

Study	Extracted finding	Preliminary labels	Refined label	Subtheme	Final narrative domain
Berry et al. (2021).	Higher IP was associated with greater depression, anxiety and suicidality.	Depression; anxiety; suicidality	Psychological distress and mental health difficulties	N/A	Imposter Phenomenon and psychological distress
Pervez et al. (2021).	Higher IP was associated with increased depression and anxiety.	Depression; anxiety	Psychological distress and mental health difficulties	N/A	Imposter Phenomenon and psychological distress
Byrom et al. (2022).	Self-depreciation characteristic of IP predicted greater perceived stress and poorer mental wellbeing.	Stress; reduced wellbeing	Psychological distress and reduced wellbeing	N/A	Imposter Phenomenon and psychological distress
Petruzziello et al. (2025).	Higher IP was associated with greater emotional exhaustion and partly accounted for the relationship between low self-esteem and burnout.	Emotional exhaustion; burnout; low self-esteem	Psychological exhaustion and burnout	N/A	Imposter Phenomenon and psychological distress
Berry et al. (2021).	Higher IP was strongly associated with perfectionistic discrepancy.	Perfectionistic discrepancy	Perfectionistic self-evaluation	Perfectionism and chronic self-discrepancy	Imposter Phenomenon as an internalising and self-critical psychological style
Tigranyan et al. (2021).	Higher IP was associated with greater perfectionist cognitions.	Perfectionist cognitions	Perfectionistic self-evaluation	Perfectionism and chronic self-discrepancy	Imposter Phenomenon as an internalising and self-critical psychological style
Kheang (2023).	Participants described self-inadequacy, low self-esteem and self-judgement as internal challenges associated with their imposter experiences.	Self-inadequacy; low self-esteem; self-judgement	Negative self-evaluation and perceived competence	Low self-worth, self-esteem and self-efficacy	Imposter Phenomenon as an internalising and self-critical psychological style
Jöstl et al. (2012).	Higher IP predicted reduced research self-efficacy, including after controlling for demographic variables.	Low research self-efficacy	Negative academic self-evaluation	Low self-worth, self-esteem and self-efficacy	Imposter Phenomenon as an internalising and self-critical psychological style
Batchelder (2019).	Self-compassion moderated the relationship between IP and psychological distress, with less distress at higher levels of self-compassion.	Self-compassion; reduced distress	Buffering role of compassion	Self-compassion as an opposing psychological process	Imposter Phenomenon as an internalising and self-critical psychological style
Tigranyan et al. (2021).	Higher imposter scores associated with lower self-compassion scores.	Low self-compassion	IP negatively associated with compassion	Self-compassion as an opposing psychological process	Imposter Phenomenon as an internalising and self-critical psychological style

Gross et al. (2024).	Students with the highest imposter self-concept characterised by greater neuroticism, rumination, low self-worth and depressiveness.	Neuroticism; rumination; low self-worth; depressiveness	Internalising emotional and cognitive vulnerability	Internalising personality profiles and cognitive vulnerability	Imposter Phenomenon as an internalising and self-critical psychological style
Kodweis et al. (2023).	IP was elevated among intuitive and perceiving personality types.	Introversion; intuitive and perceiving personality types	Personality profiles associated with IP	Internalising personality profiles and cognitive vulnerability	Imposter Phenomenon as an internalising and self-critical psychological style
Kheang (2023).	Persistent feelings of inadequacy and 'lacking' were linked with procrastination and self-disappointment.	Self-inadequacy; procrastination; self-disappointment	Avoidant responses to negative self-evaluation	Avoidance, procrastination and self-doubt cycles	Imposter Phenomenon as an internalising and self-critical psychological style
Gross et al. (2024).	Students with higher imposter self-concept were more strongly represented within profiles characterised by academic procrastination, task aversiveness and self-doubt.	Procrastination; task aversiveness; self-doubt	Avoidant responses to self-doubt and negative cognition	Avoidance, procrastination and self-doubt cycles	Imposter Phenomenon as an internalising and self-critical psychological style
Berry et al. (2021).	Lower supervisory communication, including lower warmth and emotional attunement, was associated with higher IP.	Low supervisory warmth; low emotional attunement; task-focused communication	Quality of supervisory communication and support	Supervisor relationships and academic power dynamics	Social and relational risk factors for Imposter Phenomenon
Slimi et al. (2024).	Lower supervisor empathy was associated with higher IP.	Low supervisor empathy	Quality of relational and emotional supervisory support	Supervisor relationships and academic power dynamics	Social and relational risk factors for Imposter Phenomenon
Craddock et al. (2011).	Participants compared their academic preparedness and performance with peers and interpreted perceived differences as evidence that they did not belong in doctoral study.	Peer comparison; perceived academic inadequacy; lack of belonging	Social comparison and lack of belonging	Peer comparison, competition and belonging	Social and relational risk factors for Imposter Phenomenon
Bano & O'Shea (2023).	Participants described comparison with peers as contributing to imposter feelings, particularly where peers were perceived as more knowledgeable or experienced.	Peer comparison; perceived knowledge/experience gap	Social comparison and perceived academic difference	Peer comparison, competition and belonging	Social and relational risk factors for Imposter Phenomenon
Nori & Vanttaja (2023).	Lower parental encouragement and fewer emotional and material home resources were associated with higher imposter scores.	Low parental encouragement; limited home resources	Early relational and environmental support	Family relationships and early socialisation	Social and relational risk factors for Imposter Phenomenon

Bano & O'Shea (2023).	Participants described family and sibling relationships, including lack of support, sibling comparison and excessive criticism, as contributing to their imposter experiences.	Low family support; sibling comparison; family criticism	Early relational experiences and self-evaluation	Family relationships and early socialisation	Social and relational risk factors for Imposter Phenomenon
Hogg (2023).	Higher IP among black social work doctoral students was associated with greater minority stress and lower perceived organisational support.	Minority stress; low organisational support	Marginalisation and institutional support	Social identity, marginalisation and institutional climate	Social and relational risk factors for Imposter Phenomenon
Bano & O'Shea (2023).	Female doctoral students described sexism and messages that they were less capable or did not belong within their academic environments.	Sexism; exclusion; messages of reduced capability	Discrimination, exclusion and threatened academic belonging	Social identity, marginalisation and institutional climate	Social and relational risk factors for Imposter Phenomenon
Young et al. (2024).	Most students were unaware of institutional resources addressing imposter feelings, and fewer than a quarter of those with high IP sought support.	Low awareness of resources; low support-seeking	Limited access to and engagement with institutional support	Institutional and academic support contexts	Social and relational risk factors for Imposter Phenomenon
Byrom et al. (2022).	Weaker academic support, including lower inclusion, poorer role clarity and less engagement with the research community, was associated with greater imposterism/self-depreciation.	Low inclusion; poor role clarity; limited research-community engagement	Weak academic integration and support	Institutional and academic support contexts	Social and relational risk factors for Imposter Phenomenon
Tao & Gloria (2019).	Higher IP was associated with lower intentions to persist, with the relationship partially mediated by academic self-efficacy.	Lower persistence intentions; low academic self-efficacy	Reduced academic persistence and confidence	N/A	Imposter Phenomenon and maladaptive academic functioning and persistence
Crabtree (2024).	Higher IP was associated with a greater likelihood of having considered quitting the doctoral programme or leaving academia, despite objective academic markers not being associated with IP.	Thoughts of quitting; leaving academia; IP despite objective achievement	Disengagement and attrition intentions	N/A	Imposter Phenomenon and maladaptive academic functioning and persistence

Appendix D

Study poster for advertisement



Appendix E

Communications to university gatekeepers

Dear [Gatekeeper],

My name is Niall Keeble and I am a Trainee Clinical Psychologist at the University of East Anglia (UEA). I am getting in contact to ask for your help in disseminating the details of my thesis research project for the Doctorate. It is an online research study targeting 1st, 2nd and 3rd year cohorts of Trainee Clinical Psychologists who may wish to participate. I would be grateful if you could forward details to your trainees.

The aim of the study is to explore the role of imposterism and perfectionism on Trainee Clinical Psychologist's psychological distress and wellbeing. This research can help us to understand whether there is a relationship between these constructs and highlight areas of further interest relating to trainee wellbeing for Clinical Psychology courses.

I have attached a visual poster to advertise the study, and here is the link which can be disseminated directly to students which includes information for participants.

URL PASTED HERE

If you would like further information, please see the attached document which outlines further details of the study and what is involved. This study is approved by the University of East Anglia's Faculty of Medicine and Health Sciences Research Ethics Committee and I can provide a letter stating this if required.

Thank you very much for considering this and for supporting my research project.

Best wishes,

Niall Keeble

Trainee Clinical Psychologist

Postgraduate Student (ClinPsyD)

Faculty of Medicine and Health Sciences

University of East Anglia

Email: N.Keeble@uea.ac.uk

Information attached:

Dear [Gatekeeper]

I would like to invite you to assist me in recruiting participants for a research study. Before you decide you need to understand why the research is being done and what it would involve for you and for the participants. Please take time to read the following information carefully. Ask questions if anything you read is not clear or if you would like more information. Take time to decide whether or not to facilitate this research.

WHO I AM AND WHAT THIS STUDY IS ABOUT

My name is Niall Keeble and I am a postgraduate researcher from the University of East Anglia. I am conducting research exploring the role of imposterism and perfectionism on Trainee Clinical Psychologist's psychological distress and wellbeing. This research can help us to understand whether there is a relationship between these constructs and highlight areas of further interest relating to trainee wellbeing for Clinical Psychology courses. This research is being undertaken as part of the Doctorate in Clinical Psychology and will be presented as part of a Doctoral Thesis.

WHAT I NEED YOUR ASSISTANCE WITH

I am seeking to recruit at least 92 Trainee Clinical Psychologists from clinical psychology training courses in the UK to participate in this study and I require your permission to advertise this study amongst your cohorts of Trainee Clinical Psychologists. Your role would be to distribute the study advert and an online survey link attached to this email so that participants can consider participating or contact me directly to discuss taking part. Participants access the online survey by following the URL link included in this information. Individuals currently employed as a Trainee Clinical Psychologist and undertaking a doctorate in Clinical Psychology within the United Kingdom will be eligible to take part.

WHAT TAKING PART IN THE RESEARCH WILL INVOLVE?

Participation requires completion of an online survey, which has multiple sections and will take no longer than 30 minutes. Participants will be asked to complete five questionnaires measuring including topics of feeling of imposterism, perfectionism and self-esteem, as well as aspects of psychological distress and wellbeing. Participation is voluntary.

WHO WILL HAVE ACCESS TO DATA FROM RESEARCH?

By consenting to participate, participants are agreeing to the personal information shared to be collected and used for the purpose of this research study. Any information provided will only be used for the purposes outlined in this Participant Information Statement. The 2018 General Data Protection Regulation Act and the University of East Anglia Research Data Management Policy (2019) will be adhered to at all times. Participant information

will be anonymised at the point of collection and stored securely. Data will be stored until analysis and publication are completed, then destroyed.

WHAT WILL HAPPEN TO THE RESULTS OF THE STUDY?

Findings from this study may be included in publication, and presented at research conferences but participants and their organisations will not be identifiable. Overall results can be provided in the form of a one-page lay summary which participants will receive after the study is finished.

WHO SHOULD YOU CONTACT FOR FURTHER INFORMATION?

If there is a problem or you require further information you can contact the researcher via the University at the following address:

Niall Keeble

Norwich Medical School

Faculty of Medicine and Health Sciences

University of East Anglia

NORWICH

NR4 7TJ

N.Keeble@uea.ac.uk

If you are concerned about the way this study is being conducted or you wish to make a complaint to someone independent from the study, please contact the director for the ClinPsyD programme, Dr Sian Coker, via S.Coker@uea.ac.uk .

Many thanks for your attention to this email,

Kind regards,

Niall Keeble

Incl: Study poster and URL for online survey.

Appendix F

UEA ethical approval for empirical study

University of East Anglia

University of East Anglia
Norwich Research Park
Norwich. NR4 7TJ

Email: ethicsmonitor@uea.ac.uk
Web: www.uea.ac.uk

Study title: A quantitative study exploring the relationship between Imposter Syndrome, Perfectionism and Wellbeing in Trainee Clinical Psychologists during training

Application ID: ETH2324-3017

Dear Niall,

Your application was considered on 15th November 2024 by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee).

The decision is: **approved**.

You are therefore able to start your project subject to any other necessary approvals being given.

If your study involves NHS staff and facilities, you will require Health Research Authority (HRA) governance approval before you can start this project (even though you did not require NHS-REC ethics approval). Please consult the HRA webpage about the application required, which is submitted through the IRAS system.

This approval will expire on **31st July 2025**.

Please note that your project is granted ethics approval only for the length of time identified above. Any extension to a project must obtain ethics approval by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) before continuing.

It is a requirement of this ethics approval that you should report any adverse events which occur during your project to the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) as soon as possible. An adverse event is one which was not anticipated in the research design, and which could potentially cause risk or harm to the participants or the researcher, or which reveals potential risks in the treatment under evaluation. For research involving animals, it may be the unintended death of an animal after trapping or carrying out a procedure.

Any amendments to your submitted project in terms of design, sample, data collection, focus etc. should be notified to the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) in advance to ensure ethical compliance. If the amendments are substantial a new application may be required.

Approval by the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee) should not be taken as evidence that your study is compliant with the UK General Data Protection Regulation (UK GDPR) and the Data Protection Act 2018. If you need guidance on how to make your study UK GDPR compliant, please contact the UEA Data Protection Officer (dataprotection@uea.ac.uk).

Please can you send your report once your project is completed to the FMH S-REC (fmh.ethics@uea.ac.uk).

I would like to wish you every success with your project.

On behalf of the FMH S-REC (Faculty of Medicine and Health Sciences Research Ethics Subcommittee)

Yours sincerely,

Dr Paul Linsley

Appendix G

Participant consent form

A study exploring the relationship between imposter syndrome, perfectionism and wellbeing in trainee clinical psychologists during training.

Thank you for your interest in taking part in the current research study. Please complete this form after reading the participant information sheet.

Please tick each box below if you agree with the statements:

1. I confirm that I have read and understood the Participant information Sheet for the above study. I have considered the information presented and what is to be expected.	☐
2. I understand that my participation is voluntary, and I do not have to answer any questions that I do not wish to. I understand that I can withdraw from the study by closing my browser at any point during item completion.	☐
3. I understand that my responses will not be able to be withdrawn from the research after I have completed the survey, as no personally identifiable information will be collected.	☐
4. I understand that all data collected for the current study will be anonymous and stored securely. It will not be possible to identify me in in any publication of the data.	☐
5. I consent to participate in the study by continuing and responding to the survey questions.	☐

Appendix H

Participant information sheet

University of East Anglia

Participant information sheet

A study exploring the relationship between imposter syndrome, perfectionism and wellbeing in trainee clinical psychologists during training.

What is the purpose of this study?

We are interested in improving the understanding of how many Clinical Psychology Trainees within the UK experience thoughts and feelings of imposter syndrome and perfectionism while completing the doctorate course. Additionally, we are interested in exploring the relationships between feelings of imposter syndrome, perfectionist cognitions and wellbeing in Trainee Clinical Psychologists. We hope that the findings of this study will help to improve understanding of the association between feelings of imposterism and perfectionism, and Trainee wellbeing. It is hoped that this research can help to provide courses with a better understanding of factors that Trainees may require to support their training experience in clinical psychology.

Who is conducting the research?

The current study is being completed as part of a doctoral thesis in clinical psychology by Niall Keeble at the University of East Anglia (UEA), with the supervision of Dr Imogen Rushworth, Clinical Associate Professor in Clinical Psychology, at the UEA.

What will I be asked to do?

Taking part in the study involves completing an online consent form and survey questionnaire comprising of some initial demographic information questions, followed by a number of closed questions that you will be asked to respond to by selecting from predetermined options. Questions will consider the topics of feelings of imposterism, perfectionistic thoughts, mood and wellbeing. You will not be asked any questions that could be used to personally identify you. The survey will take around 20-25 minutes to complete and you can complete it at a time that best suits you.

After completing the survey, you can choose to be entered into a prize draw to win one of several £20 gift vouchers.

What are the criteria to take part?

To take part in the research you must be 18 years of age or older and currently enrolled as a clinical psychology doctoral student at any University within the UK (excluding the University of East Anglia (UEA)). If you know of other individuals who meet thesis criteria, who might be open to contributing to this study, you are welcome to pass the current information sheet and survey link onto them for their consideration.

Do I have to take part?

No, it is completely up to you if you wish to take part as participation is entirely voluntary. If you agree to take part, you can choose not to answer any particular question and you are free to withdraw at any time by closing the internet browser window. It will not be possible to withdraw your responses after you have completed the survey, as all responses are anonymised and we will not collect any personally identifiable information about you.

What will happen to the information I provide?

All data collected will be stored electronically on secure and encrypted drives which will only be accessed by the research team. We will not collect any information that might personally identify you and all data will be stored anonymously, so you cannot be identified from any of the information you provide.

What will happen to the results of this research?

Results of the study will be used to complete a doctoral thesis that may be published in research journals or used in research presentations. If you would like to be sent a summary of the research findings, you will be able to provide your email address after completing the survey or alternatively, you can contact the researchers at the contact details below. Any email addresses provided will not be associated with any specific survey responses.

Who do I contact if I have any questions?

If you have any questions regarding the study, you can contact the lead researcher, Niall Keeble, via email at N.Keeble@uea.ac.uk . Alternatively, you can also contact the supervisor of the project, Dr Imogen Rushworth, via email, at I.Rushworth@uea.ac.uk .

Who do I contact if I have any complaints or concerns?

The ethical aspects of this study have been approved by the University of East Anglia's Faculty of Medicine and Health Science's Research and Ethics Committee. If you have any concerns regarding how this study is conducted and wish to make a complaint to a third party independent from the study, please contact the director for the ClinPsyD programme, Dr Sian Coker, at S.Coker@uea.ac.uk .

If you feel upset of distressed by any questions in this survey, please feel free to stop responding to the questions at any point. You may also seek additional mental health support through contacting your GP or you can access helpline and listening services through the details listed below. Additionally, you can draw upon support provided by your university, such as an advisor, supervisor, or student wellbeing service.

NHS Urgent Mental Health Support Helplines – website: Mental Health Helpline for Urgent Help - NHS (www.nhs.uk)

Samaritans – Tel: 116123 Website: www.samaritans.org

SANEline – Tel: 0300 304 7000 Website: www.sane.org.uk

An Ethics Committee has checked this study

This research has been approved by the Faculty of Medicine and Health Sciences research Ethics Committee at the University of East Anglia (Ref: ETH2324-3017:).

Thank you for taking the time to read this information sheet.

Appendix I

Participant debrief form

A study exploring the relationship between imposter syndrome, perfectionism and wellbeing in trainee clinical psychologists during training.

Thank you for taking part in this study exploring the factors of imposter syndrome, perfectionism and wellbeing of students completing doctoral training in clinical psychology. As outlined in the participant information sheet, if you are experiencing any distress following the survey, you are encouraged to seek mental health support by contacting your GP. Samaritans offer a 24 hour listening support service via 116 123 and SANEline offer an out-of-hours mental health helpline between 4pm-10pm via 0300 304 7000. You can also seek support via your university through advisors, supervisors or student wellbeing services.

If you are concerned about the way this study is being conducted or you wish to make a complaint to someone independent from the study, please contact the director for the ClinPsyD programme, Dr Sian Coker, via S.Coker@uea.ac.uk .

Thank you for taking part in this study.

Kind Regards,

Niall Keeble

Appendix J

Demographic questions

- To which gender identify do you identify with most?
    - Male
    - Female
    - Transgender
    - Non-binary/non-conforming
    - Prefer not to say
- What is your age?
- What ethnic group best describes you?
    - White
        - English / Welsh / Scottish / Northern Irish / British
        - Irish
        - Gypsy or Irish Traveller
        - Any other White background, please describe
    - Mixed / Multiple ethnic groups
        - White and Black Caribbean
        - White and Black African
        - White and Asian
        - Any other Mixed / Multiple ethnic background, please describe
    - Asian / Asian British
        - Indian
        - Pakistani
        - Bangladeshi
        - Chinese
        - Any other Asian background, please describe
    - Black / African / Caribbean / Black British
        - African
        - Caribbean
        - Any other Black / African / Caribbean background, please describe
    - Other ethnic group
        - Arab
        - Any other ethnic group, please describe

- Do you identify as a person with a disability?

- What is your highest level of educational attainment to date?

- Which part of the UK are you undertaking clinical psychology training?

    - North East/Yorkshire and the Humber
    - North West
    - Midlands
    - South West
    - South East
    - East of England
    - London

- What year of clinical psychology training are you currently completing?

- How many application attempts did you submit before being accepted onto Clinical Psychology training?

- How many years of clinical experience in psychology did you have prior to starting clinical psychology training?