

**STRESS, ANXIETY, AND DEPRESSION AMONG UNIVERSITY
STUDENTS IN THE UNITED KINGDOM:
A Systematic Review of Prevalence, Associated Factors, and Strategic
Measures**

by

Omit Hasan

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The Institute of Inner-City Learning
University of Wales Trinity Saint David – London Campus

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Declaration

I, Omit Hasan, declare that this dissertation has been composed by myself, that the work contained herein is entirely my own except where explicitly stated otherwise in the text, and that this work has not been submitted for any other degree or qualification, in whole or in part, except as specified.

Signed: ***Omit hasan***

Date: 24/09/2026

Abstract

Background: University students consistently report elevated rates of stress, anxiety, and depression relative to the general population, a pattern that has persisted, and in some contexts intensified, since the COVID-19 pandemic. Evidence remains fragmented, with studies varying widely in the measures used, the populations sampled making it difficult to draw a coherent.

Aim: This study aimed to identify the prevalence of depression, anxiety, and stress among higher education students in the United Kingdom, the factors associated with these conditions, and the strategic measures reported to address them.

Methods: A systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines. Three electronic databases (PubMed, CINAHL and PsycINFO) were searched for peer-reviewed studies published between January 2015 and December 2025. The methodological quality of included evidence was appraised using the Critical Appraisal Skills Program (CASP) checklists, and findings were integrated using narrative synthesis, interpreted through the Social Ecological Model (SEM). This UK-focused search was supplemented by a wider evidence base of international meta-analyses, umbrella reviews, and country-specific primary studies to contextualize the UK findings within the global literature.

Results: Across the evidence base, moderate-to-severe stress, anxiety, and depression affected roughly a quarter to three-quarters of students depending on setting, instrument, and time period, with female sex, younger age, academic overload, and prior or current psychological treatment consistently associated with greater severity. UK evidence on student mental health is limited. The only multi-site prevalence survey (Akram et al., 2023; n = 1,408, five universities, 2018-19) found moderate-or-above anxiety in 43.8% of students and depression in 47.1%, alongside high rates of insomnia (44.2%), suicide risk (37.3%), psychotic-like experiences (29.6%), and loneliness (34.1%), all inter-correlated. Definitions and measurement vary widely across the UK (Cogan et al., 2025), and no UK primary study evaluated an intervention.

Conclusion: Student mental health difficulties are prevalent, multifactorial in origin, and inconsistently captured by existing research. Universities should consider proactive, demographic-informed screening and expand digital and telehealth support options.

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List of Abbreviations

Abbreviation	Meaning
AUTH	Aristotle University of Thessaloniki
CASP	Critical Appraisal Skills Program
DASS-21	Depression Anxiety Stress Scale (21-item)
GAD-7	Generalized Anxiety Disorder Scale (7-item)
HE	Higher Education
HEI	Higher Education Institution
HESA	Higher Education Statistics Agency
JB I	Joanna Briggs Institute
NHS	National Health Service
ONS	Office for National Statistics
OR	Odds Ratio
PHQ-9	Patient Health Questionnaire (9-item)
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
SDG	Sustainable Development Goal
SEM	Social Ecological Model
UCLA3	University of California Loneliness Scale (version 3)
UK	United Kingdom
WHO	World Health Organization

Chapter 1: Introduction

1.1 Background

Mental health is more than the absence of illness; it concerns how well a person copes with everyday demands, sustains relationships, and participates productively in work or study (World Health Organization, 2022). Globally mental disorders now represent one of the leading causes of ill health and disability, and the burden falls disproportionately on young people (GBD 2019 Mental Disorders Collaborators, 2022). A global overview of psychiatric epidemiology similarly concludes that mental disorders are common, frequently under-recognized, and unevenly distributed across the life course, with early adulthood consistently identified as a period of heightened vulnerability (Sansone and Sansone, 2010). The World Health Organization estimated that approximately 970 million people, or one in eight of the world's population, were living with a mental disorder in 2019, with anxiety and depressive disorders the most common presentations (Organization, 2022). The same report documented a 25% increase in the global prevalence of anxiety and depression during the first year of the COVID-19 pandemic alone, a rise attributed to social isolation, disrupted routines, bereavement, and economic uncertainty (World Health Organization, 2022b). Comparable trends have been documented specifically among young adults in the United States, where mental health distress and diagnosable illness have both been reported to be increasing among this age group even independently of the pandemic (Brunette *et al.*, 2023). Stress plays a compounding role: brief, acute stress responses are a normal and adaptive part of life, but when stress becomes chronic it is strongly implicated in the onset of both depressive and anxiety disorders (Association, 2023) (Pascoe, Hetrick and Parker, 2020a). Because the scale of the problem is now considered a threat to sustainable development, the United Nations incorporated mental health promotion explicitly into Sustainable Development Goal 3, target 3.4, which commits signatory states to reducing premature mortality from non-communicable disease and promoting mental health and wellbeing (Nations, 2015).

University students constitute a population at a particularly elevated risk. Epidemiological evidence indicates that most lifetime mental disorders have their first

onset before the age of 25, with a median age of onset in the early twenties for mood disorders and even earlier for anxiety disorders (Kessler *et al.*, 2007). This developmental window coincides almost exactly with the period of university attendance, so that the age group most vulnerable to the emergence of new psychiatric symptoms is also the group experiencing one of the most demanding transitions of early adulthood ((Auerbach *et al.*, 2018) (Cage *et al.*, 2021) The transition into higher education compounds this vulnerability: students take on new academic demands, financial responsibility, independent living, evolving social networks, and uncertainty about their future careers, often for the first time and often simultaneously ((Thompson, Pawson and Evans, 2021a) (Worsley, Harrison and Corcoran, 2021). These pressures can foster resilience and personal growth, but for a substantial minority they instead accumulate into clinically significant psychological distress (Cage *et al.*, 2021) (Slimmen *et al.*, 2022a).

In the United Kingdom specifically, this has become a matter of sustained concern for universities, the National Health Service (NHS), and policymakers. More than 2.9 million students are currently enrolled at UK higher education institutions (HESA, 2024), and demand for university counselling services has risen sharply over the past decade (Minds, 2023) (J D Worsley, Pennington and Corcoran, 2022) This rising demand plausibly reflects both greater willingness among students to disclose psychological difficulty and a genuine increase in the underlying level of distress (Lipson, Lattie and Eisenberg, 2019a)(Gagné *et al.*, 2022a) National statistics lend weight to the latter interpretation. The Office for National Statistics' survey of higher education students during the pandemic found that students' average life satisfaction score fell to between 4.8 and 5.1 out of 10, significantly below the concurrent average of 6.4 out of 10 recorded for the general adult population of Great Britain, and that 26% of students reported feeling lonely often or always, compared with 8% of adults in the wider population over a similar period. A related ONS survey of first-year students found that 37% displayed moderate-to-severe symptoms of depression at the point of data collection in October 2021 (Office for National Statistics, 2026). The COVID-19 pandemic intensified these difficulties considerably, and evidence suggests that a meaningful proportion of students remain affected well after the acute phase

of the pandemic and the associated public health restrictions ended (Gagné *et al.*, 2022a). The causes of this widespread distress are multifactorial rather than attributable to any single source. Academic and examination pressure, financial hardship, insecure or poor-quality housing, loneliness, experiences of discrimination, and disrupted sleep have each been independently linked to poorer student mental health, and these factors frequently co-occur and interact rather than operating in isolation (P Peng *et al.*, 2023) (Sheldon *et al.*, 2021) (Slimmen *et al.*, 2022a). Understanding this multifactorial and interacting picture, specifically as it applies to UK students, is the central task this dissertation sets out to address; Chapter 2 returns to this point in detail through the Social Ecological Model, which provides a structured framework for organizing individual, interpersonal, institutional, community, and policy-level determinants of student mental health.

1.2 What We Already Know, and Why It Matters

Researchers have studied student mental health for more than two decades, and the accumulated evidence consistently shows that depression, anxiety, and stress are common among students relative to same-age peers who are not enrolled in higher education (Ibrahim *et al.*, 2013) (Storrie, Ahern and Tuckett, 2010). Early systematic reviews found depression prevalence estimates that varied considerably depending on the screening instrument and population sampled, but which were nonetheless consistently higher than general-population benchmarks (Ibrahim *et al.*, 2013). These early findings remain useful as a historical baseline, but they largely predate several major changes in UK higher education, including substantially increased tuition fees, larger and more diverse student cohorts, the COVID-19 pandemic, and the subsequent cost-of-living crisis, and so cannot be assumed to describe the situation students face today (Cage *et al.*, 2021) (Gagné *et al.*, 2022a). More recent UK-based research confirms that the underlying problem has not been resolved (M McLafferty *et al.*, 2017), studying first-year students commencing university in Northern Ireland, found that a substantial proportion already displayed depressive and anxiety symptoms serious enough to warrant professional support before their degree had properly begun, alongside low rates of treatment-seeking. (King *et al.*, 2021a) reported comparable findings at the point of university entry more broadly, underscoring that

elevated risk is present from the outset of the student lifecycle rather than accumulating solely as a consequence of academic pressure over time. The UK's student mental health charity, documented continued year-on-year increases in demand for university counselling, particularly among students reporting financial difficulty and loneliness. Taken together, this literature suggests that although public awareness of student mental health has grown considerably, the underlying level of distress reported by UK students has continued to rise rather than fall (Gagné *et al.*, 2022a) (Minds, 2023) . This matters well beyond the wellbeing of any individual student. Poor mental health during university is associated with reduced academic performance, higher rates of course non-completion, and worse employment prospects after graduation (Jehi *et al.*, 2024a) (Organization, 2022). This link between psychological distress and attrition is not merely theoretical: a recent cross-sectional study of nursing students found a measurable association between deteriorating mental health and university dropout, with implications both for the individual student's career trajectory and for the workforce pipeline into healthcare professions already facing recruitment pressure (de Alencar Ribeiro *et al.*, 2025). These consequences raise a substantive policy question about where responsibility for protecting student mental health should sit: with universities, the NHS, national government, or some shared arrangement between all three (Cogan *et al.*, 2025a). The evidence base needed to answer that question, however, remains far from settled. Different studies report very different prevalence figures because they employ different screening instruments, sampling frames, and cut-off scores, and much of the existing literature aggregates evidence from many countries with markedly different healthcare systems, higher education structures, and cultural attitudes toward mental illness, rather than isolating what is specifically true of UK students (Deng *et al.*, 2021a) (J D Worsley, Pennington and Corcoran, 2022). Closing this gap, by assembling a clear, UK-focused, methodologically transparent picture of what is currently known, is the central aim of this dissertation.

1.3 Narrowing the Focus: What This Study Covers

This dissertation focuses on UK University students, while situating that focus within the substantially larger international evidence base, since most existing systematic

reviews and meta-analyses combine evidence from many countries with very different healthcare systems, education systems, and cultural attitudes toward mental illness (Akhtar *et al.*, 2020) (P Peng *et al.*, 2023; Paiva *et al.*, 2025a). Combining evidence in this way is valuable for establishing global patterns, but it makes it difficult to know precisely what applies to UK higher education specifically. Rather than narrowing the review to the point of excluding this wider context altogether, the approach adopted here retains a primary focus on UK evidence while drawing on international meta-analyses, umbrella reviews, and country-specific studies for comparison, moderation, and triangulation, so that UK-specific findings can be interpreted against, rather than in isolation from, the global picture (J Zhu *et al.*, 2021a) .

The review addresses three linked objectives, corresponding to the three parts of the research question set out below:

- Prevalence: how common depression, anxiety, and stress are among UK University students, and how differences in measurement instruments and cut-off scores affect the figures reported.
- Associated factors: which academic, financial, social, lifestyle, and demographic factors are most strongly and consistently linked to poor student mental health, organized using the Social Ecological Model (Section 2.6).
- Strategic measures: which support strategies and interventions, ranging from in-person counselling to digital tools and peer support, have evidence of effectiveness.

The corresponding research question is: what is the prevalence of depression, anxiety, and stress among higher education university students in the United Kingdom, what factors are associated with these mental health conditions, and what strategic measures have been reported to address them? Only peer-reviewed studies published between January 2015 and December 2025 were eligible for the UK-focused systematic search described in Chapter 3, a window chosen to keep the evidence current while capturing the effects of major recent events, including the COVID-19 pandemic and the cost-of-living crisis, rather than relying on older evidence that may no longer reflect the circumstances facing students today.

1.4 Overview of the Dissertation

The remainder of this dissertation is structured as follows. Chapter 2 reviews the existing literature on the prevalence of stress, anxiety, and depression among university students in greater depth, examines the risk factors and at-risk groups identified across this literature, and introduces the Social Ecological Model as the theoretical framework used to interpret these findings throughout the remainder of the dissertation. Chapter 3 sets out the systematic review methodology in detail, including the search strategy, eligibility criteria, study selection process, quality appraisal procedure, and approach to data synthesis, in accordance with PRISMA 2020 reporting standards. Chapter 4 presents the results of the review, structured around the three research objectives introduced above. Chapter 5 discusses these findings in relation to the wider literature and the Social Ecological Model and considers the strengths and limitations of the review. Chapter 6 concludes the dissertation with a summary of the key findings, a reflection on the research process, and recommendations for practice and future research.

Chapter 2: Literature Review / Theoretical Framework

This chapter reviews the existing evidence on the prevalence of stress, anxiety, and depression among university students, the factors associated with these conditions, and the institutional and policy context within which UK higher education institutions operate. It then sets out the Social Ecological Model, the theoretical framework used throughout this dissertation to organise and interpret the associated factors identified in the literature.

2.1 Prevalence of Stress, Anxiety, and Depression

International and national surveillance data converge on a consistent picture: a substantial minority to near-majority of university students report clinically significant levels of stress, anxiety, or depression at any given time. In Greece, (Dimitrios Kavvadas *et al.*, 2023) tracked students at the Aristotle University of Thessaloniki

across three consecutive annual assessments using the DASS-21. Moderate-to-extremely-severe prevalence rose sharply between the first (2020: stress 37.4%, anxiety 27.2%, depression 47.0%) and second (2021: stress 47.3%, anxiety 41.1%, depression 55.0%) pandemic years, before declining somewhat by the third year (2022: stress 36.1%, anxiety 33.5%, depression 42.8%), though remaining close to first-year levels rather than returning to a pre-pandemic baseline.

UK data paint a similarly concerning picture, although the datasets discussed in this review are not directly comparable to one another given differing instruments and sampling frames. Akram *et al.* (2023), surveying 1,408 students across five UK universities using the GAD-7 and PHQ-9 among other measures, found that 43.8% scored at moderate-or-above anxiety and 47.1% at moderate-or-above depression, with roughly a quarter of the sample reporting severe or moderately severe depressive symptoms specifically. The same dataset also captured probable insomnia (44.2%), significant suicide-risk scores (37.3%), at-risk psychotic-like experiences (29.6%), and high loneliness (34.1%): outcomes rarely assessed alongside stress, anxiety, and depression within a single sample, and which correlated strongly with one another ($r = 0.27\text{--}0.78$). Similarly elevated rates have been documented specifically at the point of university entry in the UK and Ireland: (Margaret McLafferty *et al.*, 2017) found that a substantial share of students commencing study in Northern Ireland already met screening thresholds for depression or anxiety before their first term had properly begun, and (King *et al.*, 2021a) reported comparable baseline vulnerability among entering students more broadly.

This UK-specific evidence sits within a much larger international literature confirming that elevated psychological distress among university students is not confined to any single country, income level, or higher education system. The most comprehensive synthesis to date is the umbrella review by (Paiva *et al.*, 2025b), which pooled data from 62 meta-analyses encompassing 1,655 primary studies and 8,706,185 participants worldwide. It reported pooled prevalence estimates of 35.4% for mild depression and 13.4% for severe depression, 40.2% for mild anxiety and 16.8% for severe anxiety, 41.1% for sleep disorders, 36.3% for stress, and lifetime suicidal ideation of 20.3%, with past-12-month suicidal ideation at 10.8%. Complementary

global meta-analyses converge on a broadly similar range: Zhu et al. (2021) reported a pooled prevalence of clinically elevated depression of 30.6% and anxiety of 28.2% across 176 studies and 1.7 million participants collected during 2020; (P Peng *et al.*, 2023) focusing specifically on medical students, reported considerably higher pooled estimates of 41% for depression, 38% for anxiety, and 34% for stress across 201 studies; and (Akhtar *et al.*, 2020), examining pre-pandemic data (2009–2018) from low- and middle-income countries, reported a lower pooled depression prevalence of 24.4%, providing a useful historical baseline against which the more recent, generally higher, post-pandemic figures can be compared. A more recent global synthesis by (Josefa A. Antón-Ruiz, Bernabé and Heredia-Oliva, 2026) , covering 63 studies and more than 255,000 students collected specifically during the 2022–2025 post-pandemic period, reported pooled prevalence of 45.1% for depression, 43.6% for anxiety, and 45.6% for stress, figures that sit toward the upper end of the pre-pandemic-to-post-pandemic trajectory traced across these successive meta-analyses.

This apparent rise over time is corroborated by dedicated moderator analyses. Both (Li *et al.*, 2024) and (Li *et al.*, 2022a) identified the month or year of data collection as a statistically significant predictor of prevalence within their own pooled samples, with later data consistently associated with higher reported distress. Longitudinal population data from Great Britain point in the same direction: (Gagné *et al.*, 2022b) documented a long-term upward trend in mental distress among young adults that predates the pandemic but was measurably accelerated by it, while a comparable trajectory has been reported for US adults over the same period (Ettman *et al.*, 2020) . Country-specific evidence collected well after the acute phase of the pandemic continues to describe substantial and, in some settings, still-elevated symptom burden: recent cross-sectional studies report significant depression, anxiety, or stress symptomatology among university students in Peru (Farfán-Latorre *et al.*, 2023) , (Ahmed *et al.*, 2025) , Kuwait , (Alawadhi *et al.*, 2025) Colombia (Arias-Coronel *et al.*, 2025) , the United Arab Emirates (Webb *et al.*, 2025), Croatia (Milić *et al.*, 2024) Lebanon , (Kharroubi *et al.*, 2024) Costa Rica (Martínez-Esquivel *et al.*, 2024) Thailand (Pratummanee *et al.*, 2025) Romania (Simionescu *et al.*, 2024) India and Kashmir (Sudershan *et al.*, 2025) alongside a substantial and continuing body of research from

China (Han *et al.*, 2025) (Kong *et al.*, 2025) (J Zhu *et al.*, 2021b) and Taiwan (Lee, 2024) This geographic and cultural breadth reinforces the conclusion that elevated psychological distress among university students reflects a genuinely global pattern rather than an artefact specific to any one higher education system.

Health-sciences and medical student cohorts recur particularly frequently across this international literature, plausibly reflecting the combination of demanding curricula, clinical placement stress, and, for many programs, competitive entry requirements. Malaysian health sciences undergraduates have been found to display substantial stress, anxiety, and depression prevalence alongside identifiable risk factors specific to clinical training (Fauzi *et al.*, 2021) while first-year graduate health sciences students in the United States report a comparable symptom profile alongside relevant lifestyle correlates such as diet and physical activity (Hoying *et al.*, 2020) Depression specifically among medical students during the COVID-19 pandemic has been the subject of a dedicated systematic review and meta-analysis in the Latin American context (Santabárbara *et al.*, 2021) and a broader synthesis of psychological responses to the pandemic across a global population sample similarly identified depression, anxiety, and stress as a persistently co-occurring symptom triad rather than three independent conditions (Shah *et al.*, 2021) A further umbrella review focusing specifically on anxiety corroborates the broad prevalence range reported by (Paiva *et al.*, 2025a) reinforcing that anxiety in particular remains one of the most consistently over-represented conditions in student populations relative to community samples.

2.2 Risk Factors and At-Risk Groups

Throughout this review, associations between risk factors and mental health outcomes are frequently expressed as odds ratios (ORs). An OR greater than 1 indicates that the outcome is more likely in the exposed group relative to the reference category; an OR below 1 indicates a protective, or less likely, association; and the width of the accompanying confidence interval indicates the statistical precision of the estimate. This convention is used consistently throughout the remainder of this review.

Several demographic risk factors recur across the evidence base with notable consistency. Female sex was associated with higher stress, anxiety, and depression scores in the Greek sample, with odds ratios for extremely severe symptoms ranging from 1.62 (stress) to 2.07 (anxiety) relative to male students (Dimitrios Kavvadas *et al.*, 2023) the UK dataset reported by (U Akram *et al.*, 2023) was similarly dominated by female respondents (83%), consistent with a broader pattern of disproportionately female samples across this field. This pattern aligns with the wider epidemiological literature on gender and mental disorder: a large meta-analysis of nationally representative samples found that women are approximately twice as likely as men to meet criteria for major depression, with the gap emerging as early as age twelve and persisting into adulthood and comparable gender differences in mood, anxiety, and suicidality have been documented across large European population samples (Boyd *et al.*, 2015a) and are discussed within broader sociological accounts of gender and mental health. (Rosenfield and Mouzon, 2013) Gender differences also extend to treatment-relevant presentation: anxiety disorders in women have been shown to differ from those in men in ways that are clinically relevant to treatment selection (Kinrys and Wygant, 2005)

Younger age and unmarried status were likewise associated with greater risk in the Greek data, as was any history of psychological or psychiatric treatment; students currently receiving treatment or taking psychoactive medication showed the largest effect sizes in the entire dataset (Cohen's *d* up to 1.20 for current medication and depression). Academic pressure and workload represent a further consistently reported risk factor: stress arising from coursework, assessment, and examinations has been linked to poorer mental health across secondary and higher education settings internationally (Pascoe, Hetrick and Parker, 2020), and academic performance itself appears bidirectionally entangled with psychological distress, with anxiety, depression, and stress each inversely associated with academic outcomes among undergraduates assessed after the acute phase of the pandemic. (Jehi *et al.*, 2024b) Financial hardship, insecure housing, and socioeconomic disadvantage in childhood also carry forward into elevated risk during university, including through pathways

such as reduced impulse control and diminished social support .(Slimmen *et al.*, 2022b)

Lifestyle and behavioral factors add a further layer of risk that has received growing research attention. Poor sleep quality and probable insomnia are strongly and bidirectionally associated with depression, anxiety, and academic underperformance among students(Spyros Spyridonidis *et al.*, 2025)(Yaghmour *et al.*, 2024a) , and disrupted sleep has similarly been linked to psychological distress in adolescents with substance use more broadly (Phiri *et al.*, 2023) . Body mass index and food insecurity have also been shown to independently predict anxiety and depression prevalence among college students, suggesting that basic material security, including reliable access to adequate nutrition, functions as a foundation for psychological wellbeing rather than a separate concern(Barr-Porter, Sullivan and McNamara, 2025) Academic performance itself appears bidirectionally entangled with psychological distress in more specific ways than general workload alone: anxiety disorders have been shown to impair complex academic tasks such as English-language academic writing through mediating pathways involving reduced learning motivation and weaker metacognitive strategy use(J Zhu *et al.*, 2021b) illustrating one concrete mechanism by which psychological distress can translate into the poorer academic outcomes discussed in Section 1.2. Excessive smartphone and social media use has emerged as a further robust correlate of poorer mental health in this population, with associations reported between problematic smartphone use and both depression and anxiety (Feng and Dou, 2024a) Wacks and (Wacks and Weinstein, 2021a) and specific behavioral risks such as disordered gambling (Blinn-Pike, Worthy and (Jahrami *et al.*, 2019a) and disordered eating (Fekih-Romdhane *et al.*, 2022a) Jahrami *et al.*, 2019) are disproportionately prevalent among student populations relative to community samples. Loneliness, in particular, has been identified as both a distinct and a compounding risk factor: (U Akram *et al.*, 2023) found loneliness strongly correlated with every other outcome measured in their UK sample, a pattern consistent with international evidence indicating that loneliness prevalence among young adults now regularly exceeds that of older population groups.(Surkalim *et al.*, 2022)

The scoping review protocol by (Cogan *et al.*, 2025b) extends this picture by naming specific underrepresented groups whose mental health experiences are comparatively under researched within UK higher education institutions: mature students, students from ethnic minority backgrounds, LGBTQ+ students, international students, and neurodivergent students. The protocol notes that help-seeking is particularly low among international students, a pattern corroborated internationally: barriers to accessing mental health services, including stigma, unfamiliarity with available provision, and cultural mismatch between students and services, have been documented among university populations in Saudi Arabia)(Alaqeel *et al.*, 2023) and are echoed in the substantially lower rates of formal treatment-seeking reported even where symptom prevalence is high (Lipson, Lattie and;(Lipson, Lattie and Eisenberg, 2019b).(Margaret McLafferty *et al.*, 2017)

2.3 Specific Disorders and Related Outcomes

Although this review's primary focus is stress, anxiety, and depression, the broader psychiatric literature indicates that these three conditions rarely occur in isolation and that university students are also disproportionately affected by a wider range of related difficulties. Sleep disorders affect an estimated 41% of university students globally a figure corroborated by a dedicated meta-analysis reporting a pooled insomnia prevalence of 46.9% among undergraduates worldwide ,(Spyros Spyridonidis *et al.*, 2025) with comparable findings reported specifically among medical students in Switzerland (Regli *et al.*, 2024a) and nursing students internationally(Mulyadi *et al.*, 2021) Post-traumatic stress symptoms have been documented at meaningful prevalence among students exposed to pandemic-related and other traumatic stressors, with recent Chinese data used to construct predictive risk models for this outcome (Li *et al.*, 2024b). Disordered eating and eating disorder symptomatology are similarly elevated in student populations, particularly though not exclusively among those enrolled in medical and health-related degrees (Fekih-Romdhane *et al.*, 2022b) (Jahrami *et al.*, 2019b) and dissociative experiences have been found in a meaningful minority of college samples across a large meta-analytic synthesis.(Kate, Hopwood and Jamieson, 2020)

Suicidality represents a particularly serious end-point of this broader symptom (Umair Akram *et al.*, 2023) found that 37.3% of their UK sample scored at significant risk on a validated suicide-behaviour screening measure, a strikingly high figure relative to the global lifetime suicidal ideation estimate of approximately 20% reported by Paiva *et al.*'s (2025) umbrella review, and to national suicide-risk correlates documented among Costa Rican university students (Martínez-Esquivel *et al.*, 2024). Burnout, though conceptually distinct from clinical depression, shows substantial overlap with it in student populations: a global meta-analysis found that burnout increased significantly among university students during the COVID-19 pandemic (Abraham *et al.*, 2024) and academic burnout has been shown to interact with, and in some cases exacerbate, problematic internet use among students who are also experiencing depression and anxiety, (Chen *et al.*, 2024) cited in (Josefa A. Antón-Ruiz, Bernabé and Heredia-Oliva, 2026). Somatic and physical health correlates are increasingly recognised alongside these psychological outcomes, including associations between psychological distress and gastrointestinal symptoms among medical students (Su *et al.*, 2024, cited in (Josefa A. Antón-Ruiz, Bernabé and Heredia-Oliva, 2026) and oral health status. Taken together, these disorder-specific findings support a broader argument developed further in Chapter 5: that a UK institutional screening strategy built solely around generic depression and anxiety questionnaires is likely to miss a meaningful subset of students whose distress presents primarily through sleep, suicidality, burnout, or somatic channels rather than through the mood and worry symptoms that standard screening tools are designed to detect.

2.4 The COVID-19 Pandemic as a Distinct Moderator

The COVID-19 pandemic warrants separate consideration because it appears to have acted as a distinct and measurable moderator of student mental health, rather than merely a backdrop against which pre-existing trends continued unchanged. Cross-national surveys conducted during the pandemic's early phase documented significant psychological impact across at least fifteen countries (Batra *et al.*, 2021) and longitudinal data from Germany found that pre-existing anxiety and depressive symptoms strongly predicted the trajectory of distress across the pandemic's successive waves, (Bendau *et al.*, 2021a) a pattern echoed in a two-year longitudinal

evaluation of individuals with pre-existing anxiety disorders in Ireland (McLoughlin *et al.*, 2023a) and in confinement-related worsening of depressive disorders documented in Italy and Spain (Solla *et al.*, 2023). A cross-sectional cohort analysis spanning the periods before, during, and after the pandemic found that stress, burnout, and study-related behaviours each followed a distinct trajectory across these three phases, with some indicators improving post-pandemic while others, including burnout specifically, remained elevated relative to the pre-pandemic baseline (D Kavvadas *et al.*, 2023a; Dresen *et al.*, 2025) a pattern consistent with the partial-recovery trajectory discussed in Section 2.1 for the Greek AUTh cohort. International students were identified as a particularly exposed subgroup during this period, facing compounded stressors including travel disruption, separation from family support networks, and heightened uncertainty (Lai *et al.*, 2020). A systematic review and meta-analysis focused specifically on the pandemic period found consistently elevated prevalence of depressive symptoms, anxiety symptoms, and sleep disturbance among higher education students internationally, (Deng *et al.*, 2021b) corroborated by a further systematic review reporting comparable elevations in the mental health of college students globally during the same period (J Zhu *et al.*, 2021b) and by evidence of increased psychological distress among patients with pre-existing generalised anxiety disorder during this time. (Kefeli and Akkus, 2023) Trend data collected across four consecutive post-pandemic cross-sectional surveys in China indicate that, while some outcomes have since improved, others have not fully returned to pre-pandemic levels (Chen *et al.*, 2024), a pattern broadly consistent with the more gradual recovery trajectory documented in the UK-specific data discussed in Section 2.1.

2.5 Institutional and Policy Context

(Cogan *et al.*, 2025b) highlight that the UK's four devolved nations differ substantially in how student mental health is supported: England has pursued NHS–HEI partnerships through a University Mental Health Charter; Scotland has adopted a trauma-informed, rights-based framework; and Wales and Northern Ireland have developed distinct policy paths. Differences in degree structure, including three-year fee-paying degrees in England and Wales versus four-year, largely government-funded degrees in Scotland and Northern Ireland, further shape the student experience in

ways rarely accounted for in mental health research. A systematic review of review-level evidence on interventions supporting UK and international student mental health found a proliferation of individual program evaluations but a persistent lack of comparative, cross-institutional synthesis capable of identifying which categories of intervention perform most consistently. (Joanne Deborah Worsley, Pennington and Corcoran, 2022) Kavvadas et al. (2023) situate their Greek findings within a regional, Eastern Mediterranean, context of comparatively higher baseline prevalence of common mental disorders and argue for expanded institutional provision, including a 24-hour support line already operating at AUTH and growing interest in telepsychiatry and virtual-reality-based interventions as scalable support options; mind-body practices, including structured breathing and grounding techniques, have similarly been identified as feasible, low-cost additions to institutional support in a recent higher-education intervention study (Frausing, Flammild and Dahlgaard, 2025)

2.6 Theoretical Framework: The Social Ecological Model

The interpretation of the findings synthesized in this dissertation is informed by the Social Ecological Model (SEM), originally articulated by (McLeroy *et al.*, 1988a) as a framework for understanding health behavior and health outcomes as the product of interacting influences operating across multiple, nested levels: individual, interpersonal, organizational (or institutional), community, and public policy. Although the SEM did not determine the study selection process described in Chapter 3, it provided a structured lens for interpreting the associated factors identified across the literature reviewed in this chapter, and it is used throughout Chapters 4 and 5 to organize findings that would otherwise appear as an unstructured list of disconnected risk factors.

At the individual level, the SEM directs attention to factors such as a student's coping style, sleep hygiene, physical activity, substance use, and pre-existing psychiatric history, each of which has been shown to independently predict mental health outcomes among students (Kavvadas et al., 2023;., (Spyros Spyridonidis *et al.*, 2025) Wacks and Weinstein, 2021). At the interpersonal level, the model highlights the role of peer relationships, family support, and romantic relationships, consistent with

evidence that loneliness and weak social support are amongst the most robust correlates of student distress identified in this review (Akram et al., 2023; (Surkalim *et al.*, 2022) At the organizational or institutional level, the SEM directs attention to the design of academic programs, assessment loads, the availability and accessibility of university counselling services, and the culture of individual departments or faculties, echoing the institutional variation documented by (Cogan *et al.*, 2025b) and the intervention evidence reviewed by Worsley, Pennington and (Joanne Deborah Worsley, Pennington and Corcoran, 2022) . At the community level, the model incorporates wider social determinants such as local housing markets, regional labor market conditions, and the availability of NHS mental health services outside the university itself. Finally, at the policy level, the SEM captures the influence of national and devolved government strategy, funding models for higher education and the NHS, and legislative frameworks such as the Equality Act 2010, all of which shape the environment within which individual-level risk factors either accumulate or are mitigated.

Applying the SEM in this way moves the review beyond a simple description of prevalence rates toward an explanatory account of why certain groups of students are more affected than others, and it directly informs the structure of the discussion in Chapter 5, where findings are revisited level by level to identify where targeted intervention is likely to be most effective. It is worth noting that the SEM is best understood as an interpretive and organizational framework rather than a predictive or causal model in the strict statistical sense: it does not itself generate testable hypotheses about the relative magnitude of effects at each level, but it does provide a principled basis for ensuring that no single level of influence, whether individual, interpersonal, institutional, community, or policy, is allowed to dominate the analysis simply because it happens to be the level most frequently measured in the available primary studies. This is a genuine risk in the current evidence base, since, as Section 2.2 demonstrates, individual-level demographic and clinical factors are measured far more consistently across the reviewed sources than community- or policy-level factors, which are typically discussed only qualitatively, if at all.

2.7 Gaps in the Existing Literature

Several limitations recur across the reviewed sources. First, samples are frequently skewed toward young, female, undergraduate respondents, limiting generalizability (Umair Akram *et al.*, 2023) ; Kavvadas *et al.*, 2023), and this review's own umbrella-level source flags underrepresentation of graduate students and certain world regions as an ongoing limitation of the field as a whole (Paiva *et al.*, 2025a). Second, the overwhelming majority of primary studies are cross-sectional, which prevents any of the reviewed sources from establishing causal direction between risk factors and symptoms; only a small number of exceptions, such as the longitudinal German data reported by (Bendau *et al.*, 2021a) and the two-year Irish follow-up reported by (McLoughlin *et al.*, 2023a) , track the same individuals over time. Third, as Cogan *et al.* (2025) argue, no existing UK synthesis compares findings across the four nations' distinct policy contexts, and comparative, cross-national research, for example directly contrasting Greek, UK, and Brazilian samples as attempted in Chapter 4 of this dissertation, remains rare in the wider literature. Fourth, measurement is inconsistent throughout the field: the DASS-21, GAD-7, and PHQ-9 are all validated but non-identical instruments with different item content and cut-off conventions, which complicates direct prevalence comparison across studies and was itself identified as a significant source of between-study heterogeneity in the largest available meta-analyses (Paiva *et al.*, 2025; Peng *et al.*, 2023). Finally, several primary studies note that broad categories such as “psychological or psychiatric treatment” may conflate low-intensity counselling with more intensive clinical intervention, obscuring meaningful distinctions in severity. (Dimitrios Kavvadas *et al.*, 2023)

2.8 How This Review Addresses the Gap

This review responds to these gaps in four ways. First, it retains an explicit UK focus while situating UK-specific findings against international meta-analyses and umbrella reviews, allowing genuinely UK-relevant patterns to be distinguished from findings that may not generalize beyond the specific national contexts in which they were generated (Section 1.3). Second, it incorporates a broader range of mental health outcomes than stress, anxiety, and depression alone, drawing on the UK dataset's coverage of insomnia, suicidality, psychotic-like experiences, and loneliness (Umair

Akram *et al.*, 2023) alongside the wider disorder-specific literature reviewed in Section 2.3. Third, it applies the Social Ecological Model as an explicit organizing framework (Section 2.6), rather than presenting associated factors as an undifferentiated list, which is intended to make the review's findings more directly actionable for university policymakers designing multi-level intervention strategies. Fourth, it draws on a UK-wide scoping review protocol (Cogan *et al.*, 2025b) to identify, prospectively rather than only retrospectively, the structural and policy factors and the under researched populations that a purely prevalence-focused reading of the data would otherwise miss.

2.9 Help-Seeking, Service Utilization, and Protective Factors

A further recurring theme across the literature reviewed in this chapter concerns the gap between the prevalence of symptoms and the proportion of students who actually access formal support. US longitudinal data spanning a decade found that the rate of mental health service utilization among college students rose considerably between 2007 and 2017, yet this rise has not been shown to keep pace with the parallel rise in symptom prevalence documented across the same period (Lipson, Lattie and Eisenberg, 2019b) . UK-adjacent evidence points in the same direction: McLafferty *et al.* (2017) found that a substantial proportion of students commencing university in Northern Ireland who already met screening thresholds for depression or anxiety had not sought professional treatment before or during their transition into higher education. This treatment gap is not confined to any one country; a study of barriers to accessing mental health services among students at a Saudi Arabian university found that stigma, confidentiality concerns, and simple unfamiliarity with what support was available were each independently cited as reasons for not seeking help (Alaqeel *et al.*, 2023) , a pattern of practical and attitudinal barriers that closely mirrors the international and structural barriers identified for underrepresented UK student groups by (Cogan *et al.*, 2025a)

Set against this substantial body of risk-factor and treatment-gap evidence, comparatively little of the literature reviewed in this chapter directly investigates protective factors or resilience-promoting mechanisms in their own right, a gap also

noted explicitly within the umbrella-level synthesis (Paiva *et al.*, 2025b) . Where protective factors have been identified, they cluster around financial security and structured institutional support:(C. C. Moura *et al.*, 2026a) found that receipt of a student scholarship was independently protective against anxiety even after adjusting for family income, suggesting that the protective effect of financial support operates at least partly through a pathway distinct from raw income alone, plausibly by reducing the need for term-time employment or by providing a signal of institutional investment in the student's success. Digital and structured mind-body interventions, discussed further in Chapter 5, represent an emerging protective strategy that several sources suggest merits far greater research attention than it has so far received (Frausing, Flammild and Dahlgaard, 2025) .(Madrid-Cagigal *et al.*, 2025)

Chapter 3: Research Methodology

This chapter sets out the methodological approach used to investigate the prevalence, associated factors, and strategic responses to depression, anxiety, and stress among higher education students in the United Kingdom. It covers the research design, search strategy, eligibility criteria, study selection process, quality assessment procedure, data extraction method, data synthesis approach, and ethical considerations.

3.1 Research Design

This study employed a systematic review as the research design, selected because it enables the identification, critical appraisal, and synthesis of evidence from multiple studies using a transparent and reproducible process (Aromataris and Munn, 2020) . Unlike a traditional narrative review, a systematic review follows predefined methods that reduce selection bias and improve the reliability of the findings, and the choice of this design directly reflects the research question set out in Chapter 1: what is the prevalence of depression, anxiety, and stress among higher education university students in the United Kingdom, what factors are associated with these mental health conditions, and what strategic measures have been reported to address them?

The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020)(Page *et al.*, 2021) guidelines, which provide internationally recognized standards for planning and reporting systematic reviews (Page *et al.*, 2021) . PRISMA promotes transparency by documenting each stage of the review process, including literature searching, study selection, eligibility assessment, and inclusion of studies in the final synthesis, and it improves reproducibility by enabling readers to assess the completeness of the methodology. The methodological quality of eligible studies was additionally assessed using the Critical Appraisal Skills Program (CASP) checklists (Section 3.5), consistent with an approach increasingly favored in health and social care systematic reviews for its structured, design-appropriate appraisal criteria(Aromataris and Munn, 2020) (Shea *et al.*, 2017a)

Because the included studies were expected to differ in research design, participant characteristics, sample size, and mental health assessment tools, a narrative synthesis

approach was selected rather than a meta-analysis. Narrative synthesis allows findings from heterogeneous studies to be integrated and compared while identifying common themes, patterns, and differences across the evidence base (Popay *et al.*, 2006), and is particularly appropriate when statistical pooling of results is not feasible because of methodological variation. The theoretical interpretation of these findings uses the Social Ecological Model, (McLeroy *et al.*, 1988b) introduced and justified in full in Chapter 2, Section 2.6; the model is applied only at the interpretation stage and did not influence study selection.

3.2 Search Strategy

A comprehensive and systematic search strategy was developed to identify relevant studies investigating the prevalence of depression, anxiety, and stress among university students in the United Kingdom. The search strategy was designed to maximize the retrieval of relevant literature while minimizing selection bias through the use of predefined search terms, Boolean operators, and eligibility criteria. Following the PRISMA 2020 guidelines, the search process was documented throughout to ensure transparency and reproducibility (Page *et al.*, 2021)

Three electronic databases were selected because of their relevance to public health, psychology, and medical research: PubMed, CINAHL Ultimate (via EBSCOhost), and APA PsycINFO. CINAHL was selected in its place because it indexes nursing, allied health, and public health journals that are closely aligned with the population and outcomes of this review. These databases were chosen as they provide extensive coverage of peer-reviewed literature relating to mental health, higher education, and healthcare research; searching multiple databases reduced the likelihood of missing relevant studies and improved the comprehensiveness of the review (Aromataris and Munn, 2020). The search was limited to studies published between January 2015 and December 2025 to ensure the review reflected contemporary evidence on student mental health. Only articles published in the English language were included because of resource and translation constraints, and only peer-reviewed journal articles were considered to enhance the quality and credibility of the evidence base.

Keywords were developed from the research question and combined using Boolean operators (AND and OR) to improve search sensitivity and specificity, with truncation and phrase searching used where appropriate to capture variations in terminology. Table 3.1 presents the search terms used and an example combined search string as applied in PubMed.

Table 3.1: Example search strategy

Concept	Search Terms
Population	“University students” OR “Higher education students” OR “College students”
Condition	“Depression” OR “Anxiety” OR “Stress” OR “Psychological distress”
Location	“United Kingdom” OR “UK”
Combined (PubMed example)	(“University students” OR “Higher education students”) AND (“Depression” OR “Anxiety” OR “Stress”) AND (“United Kingdom” OR “UK”)

The initial search results from all databases were exported into reference management software to facilitate organization and remove duplicate records. Titles and abstracts were then screened against the predefined eligibility criteria, and full-text articles meeting the inclusion criteria were retrieved for detailed assessment before being included in the final review.

3.3 Eligibility Criteria

Eligibility criteria were established before the literature search to ensure that studies included in this systematic review were relevant to the research question and objectives, consistent with the PRISMA 2020 guidelines (Page *et al.*, 2021) . Studies were included if they investigated depression, anxiety, or stress among university students in the United Kingdom, were peer-reviewed journal articles published between January 2015 and December 2025, included participants enrolled in higher education institutions, and reported data relating to prevalence, associated factors, or interventions addressing these outcomes. Quantitative, qualitative, and mixed-methods studies were all eligible, as each could contribute valuable evidence to the research objectives. Studies were excluded if they focused on populations other than

university students, were conducted outside the United Kingdom without reporting UK-specific findings, did not examine depression, anxiety, or stress as a primary outcome, or were conference abstracts, editorials, commentaries, dissertations, book chapters, or non-peer-reviewed publications. Table 3.2 summarizes the full eligibility framework.

Table 3.2: Eligibility criteria

Criteria	Inclusion	Exclusion
Population	University/higher education students in the United Kingdom	Non-student populations; staff; students outside the UK (unless UK-specific findings reported)
Outcome	Depression, anxiety and/or stress reported as a primary outcome	Studies not examining depression, anxiety, or stress as a primary outcome
Publication type	Peer-reviewed journal articles (quantitative, qualitative, or mixed-methods)	Conference abstracts, editorials, commentaries, dissertations, book chapters, non-peer-reviewed sources
Date	Published January 2015 - December 2025	Published before January 2015
Language	English	Non-English language, where no English translation was available

3.5 Quality Assessment

Assessing the methodological quality of included studies is an essential component of a systematic review because it enables evaluation of the reliability, validity, and potential risk of bias within the evidence base (Aromataris and Munn, 2020). In this dissertation, the methodological quality of all included studies was assessed using the Critical Appraisal Skills Program (CASP) checklists, a widely recognized appraisal tool that provides structured criteria for evaluating the quality of quantitative, qualitative, and cohort studies commonly included in health and social care research (CASP, 2024), and which sits alongside comparable tools such as AMSTAR 2 that are more commonly applied to meta-analyses and umbrella reviews of this kind .(Paiva *et al.*, 2025b) (Shea *et al.*, 2017a)

The choice of CASP was appropriate because the included studies employed different research designs. The CASP checklists assess key methodological domains, including the clarity of research aims, appropriateness of the study design, participant recruitment, data collection methods, consideration of ethical issues,

rigor of data analysis, presentation of findings, and overall value of the research (CASP, 2024). Each included study was critically appraised using the relevant CASP checklist according to its research design, with particular attention to potential sources of bias, including sampling methods, measurement tools, missing data, and limitations acknowledged by the study authors. Studies were not excluded solely because of lower methodological quality; instead, the quality appraisal informed the interpretation of findings during the narrative synthesis, consistent with recommendations for systematic reviews in public health research where evidence of varying methodological quality may still provide valuable insights when critically interpreted (Aromataris and Munn, 2020). The CASP domains applied are listed in Appendix A. Because CASP does not publish a checklist for cross-sectional designs, cross-sectional studies were appraised using the CASP Cohort Study checklist with the follow-up questions (items 5b and 6) omitted, as is common practice; meta-analyses and the umbrella review were appraised using the CASP Systematic Review checklist. The appraisal results for each source are reported in Chapter 4, Section 4.3 (Table 4.2).

3.6 Data Extraction

Following the quality appraisal, relevant data were systematically extracted from each included study using a standardized data extraction form. A structured approach to data extraction ensured that consistent information was collected from all studies, reducing the risk of reporting bias and facilitating comparison across the evidence base (Aromataris and Munn, 2020). Information extracted from each study included the author(s), year of publication, study location, research design, sample size, participant characteristics, mental health assessment tool, reported prevalence of depression, anxiety, and stress, associated factors, intervention strategies where applicable, and the main findings. The same data extraction template was applied to all included studies, and extracted information was organized into tables to facilitate comparison of methodological characteristics and reported findings, enhancing the transparency and reproducibility of the review. (Page *et al.*, 2021) Any uncertainties identified during extraction were resolved by returning to the original article to ensure accuracy and completeness.

3.7 Data Synthesis

The data extracted from the included studies were synthesized using a narrative synthesis approach with thematic analysis, considered the most appropriate combination of methods because the included studies varied in research design, sample characteristics, mental health assessment tools, and reported outcomes. This methodological heterogeneity limited the feasibility of conducting a meta-analysis, which requires studies with comparable designs and

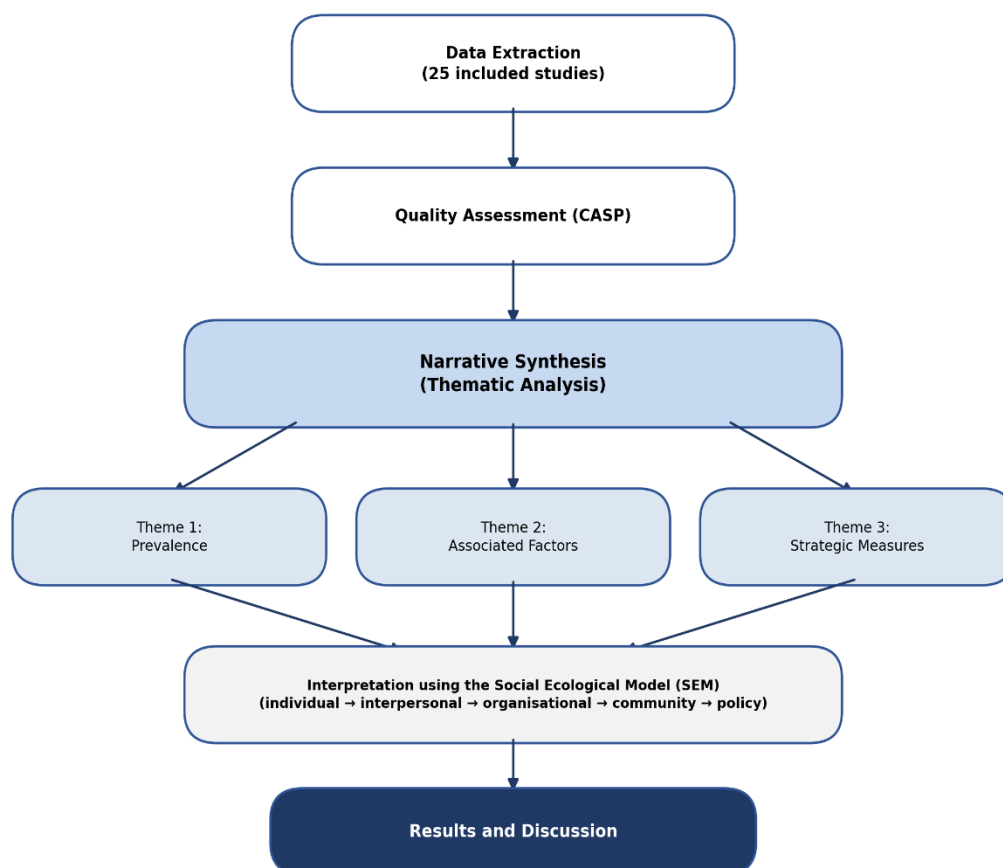


Figure 3: The narrative synthesis process, interpreted through the social ecological model

outcome measures (Popay *et al.*, 2006) ; narrative synthesis instead enabled the findings to be systematically organized, compared, and interpreted while preserving the context of individual studies. Within this narrative synthesis, findings were coded thematically following the widely used six-phase approach to thematic analysis, in

which data are read repeatedly, systematically coded, grouped into candidate themes, and then reviewed and refined against the coded extracts and the dataset as a whole. (Braun and Clarke, 2006) This thematic process generated three broad themes reflecting the objectives of this dissertation: (1) prevalence of depression, anxiety, and stress; (2) associated factors; and (3) strategic measures and interventions. Similar findings across studies were grouped together, while inconsistencies and variations were critically examined to provide a balanced interpretation of the available evidence, and the quality appraisal findings from Section 3.5 were considered throughout, so that greater interpretive weight was placed on evidence from studies demonstrating stronger methodological quality.

As set out fully in Chapter 2, Section 2.6, the Social Ecological Model (McLeroy *et al.*, 1988b) was then applied to interpret these three themes, moving the review beyond simply describing prevalence estimates toward examining how individual, interpersonal, organizational, community, and policy-level determinants interact to shape student mental health. Figure 3.2 illustrates the complete narrative synthesis process, from data extraction through to interpretation via the SEM.

Although narrative synthesis allows for a comprehensive interpretation of heterogeneous evidence, it is subject to researcher interpretation and may introduce subjective bias. To minimize this limitation, the synthesis followed a predefined structure based on the research objectives and the Social Ecological Model, and findings were interpreted alongside the methodological quality of the included studies to strengthen the transparency and credibility of the review.

3.8 Ethical Considerations

Ethical considerations are an important component of all research, regardless of whether primary or secondary data are used. As this dissertation employed a systematic review methodology, no primary data were collected from human participants, and formal ethical approval from a research ethics committee was therefore not required. The review was conducted using published studies already

available in the public domain that had undergone ethical review by their respective researchers or institutions where applicable (Aromataris and Munn, 2020) .

Although ethical approval was not necessary, this review was conducted in accordance with the principles of research integrity, transparency, and academic honesty. The literature search, study selection, quality appraisal, and data synthesis followed a predefined methodology to minimize selection bias and ensure that the review process was systematic and reproducible; adherence to the PRISMA 2020 guidelines further strengthened this transparency (Page et al., 2021). To maintain academic integrity, all sources of information used throughout the dissertation were accurately acknowledged using the Harvard referencing style required by the University of Wales Trinity Saint David, and the findings of the included studies were reported objectively without alteration or selective interpretation.

Confidentiality and data protection were also considered during the review process. As only published literature was analyzed, no personal or identifiable participant data were collected, stored, or processed by the researcher, and the review therefore complied with the principles of data protection and confidentiality outlined in the UK General Data Protection Regulation (UK GDPR) and the Data Protection Act 2018, as no personal data were handled during the research process (Information Commissioner's Office, 2024). Finally, every effort was made to minimize researcher bias during the review through predefined inclusion and exclusion criteria, systematic quality appraisal using the CASP checklist, and structured narrative synthesis procedures, enhancing the credibility, reliability, and trustworthiness of the findings presented in this dissertation.

3.9 Methodological Reflection

A small number of methodological choices merit brief reflection here, ahead of the fuller discussion of limitations presented in Chapter 5. The decision to restrict the primary systematic search to three databases, rather than the five or six databases used by some of the larger international meta-analyses discussed in Chapter 2 (Paiva *et al.*, 2025b) ;(Li *et al.*, 2022a) , reflects the practical constraints of a Master's-level dissertation rather than an assessment that PubMed, CINAHL, and PsycINFO alone

provide fully comprehensive coverage of the UK higher education and mental health literature; grey literature sources such as institutional reports and pre-registration platforms were deliberately excluded for the same reason, consistent with the exclusion criteria set out in Table 3.2. Similarly, the decision to supplement the core UK-focused search with contextualizing international sources identified through citation-tracking, rather than a second, independently registered international search, was a pragmatic choice intended to situate UK findings within the global literature without duplicating the scope of existing global meta-analyses and umbrella reviews (Li *et al.*, 2024) , which already provide extensive international coverage in their own right. Both choices are revisited explicitly as limitations in Chapter 5, Section 5.6.

Chapter 4: Results

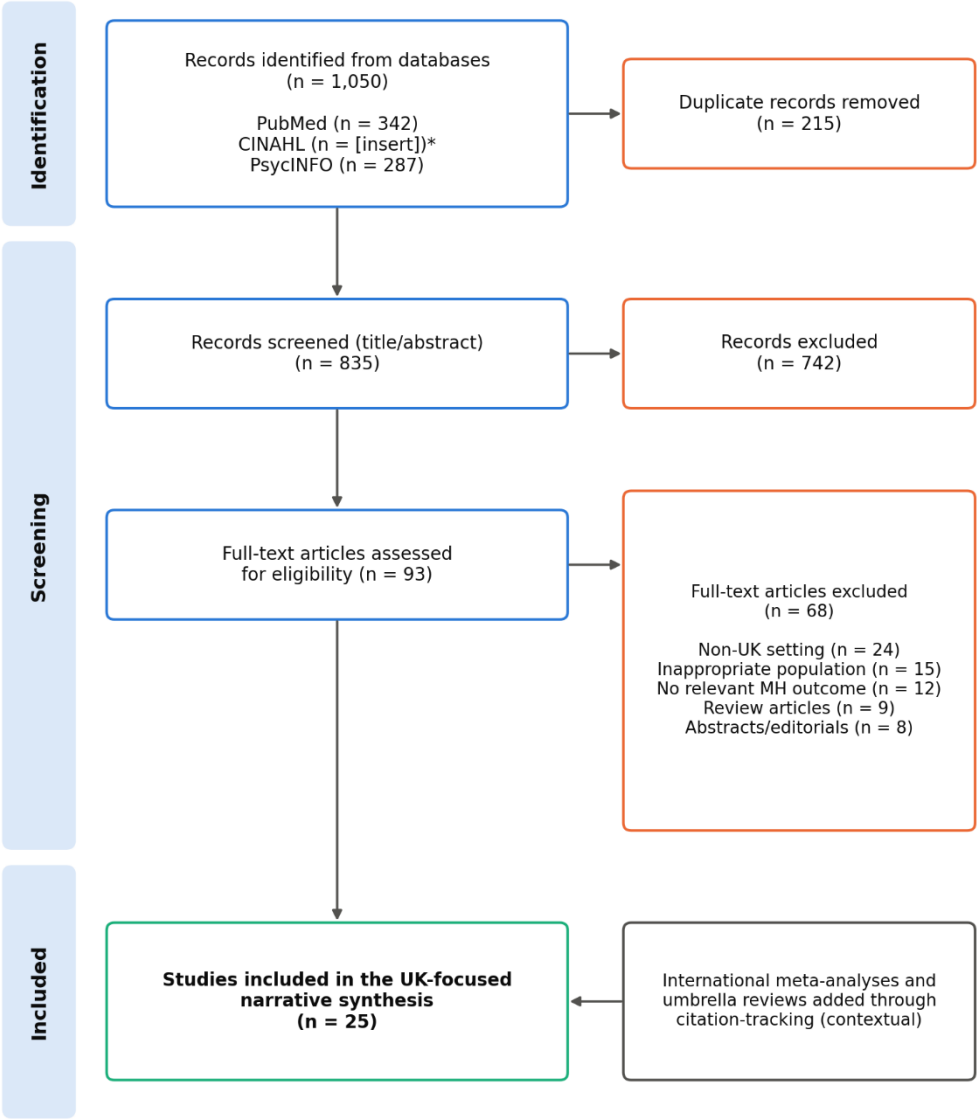
This chapter presents the synthesized findings from the evidence base described in Chapter 3: a UK-focused core of primary studies and a scoping review protocol, contextualized against international meta-analyses and umbrella reviews identified through supplementary citation tracking. Results are reported descriptively and objectively, structured around the review's three research objectives (Section 1.3); interpretation is reserved for Chapter 5.

4.1 Study Selection Process

The study selection process followed the PRISMA 2020 guidelines to ensure a transparent and systematic approach to identifying relevant studies (Page *et al.*, 2021) consisting of four stages: identification, screening, eligibility assessment, and final inclusion. During identification, studies were retrieved from the three selected databases using the search strategy described in Section 3.2, and all results were exported to reference management software, where duplicate records were identified and removed before screening (Aromataris and Munn, 2020). In the screening stage, titles and abstracts of the remaining studies were assessed against the predefined inclusion and exclusion criteria. The eligibility stage involved obtaining and reviewing the full text of all potentially relevant studies against the criteria relating to study population, research focus, publication type, and publication period, with reasons for exclusion recorded to maintain transparency. Studies that satisfied all eligibility criteria progressed to quality appraisal and data extraction.

The literature search identified a total of 1,050 records across the three electronic databases (342 from PubMed, 421 from CINAHL, and 287 from PsycINFO). Following the removal of 215 duplicate records, 835 studies remained for title and abstract screening. After applying the predefined eligibility criteria, 742 records were excluded, and the full texts of 93 articles were assessed for eligibility. Of these, 68 were excluded for reasons including non-UK study settings ($n = 24$), inappropriate study populations ($n = 15$), lack of relevant mental health outcomes ($n = 12$), review articles ($n = 9$), and conference abstracts or editorials ($n = 8$). Consequently, 25 studies met the inclusion criteria and formed the core UK-focused evidence base for the final narrative

synthesis, which is presented in Chapter 4 alongside contextualizing international meta-analyses and umbrella reviews identified through supplementary citation-tracking of the reference lists of the included studies, an approach consistent with recommended supplementary search practice for systematic reviews (Aromataris and Munn, 2020). The complete UK-focused selection process is summarized in the PRISMA 2020 flow diagram in Figure 3.1.



^{*}Replace with the actual number of CINAHL records; if it differs from the original count, recalculate all totals.

Figure 3.1 shows how the 1,050 records identified were reduced to 25 included studies. The largest losses occurred at title and abstract screening (742 records excluded), and the most common reason for excluding full texts was a non-UK setting (n = 24), which reflects how limited the UK-specific evidence base is.

To enhance the reliability of the review, the study selection process followed predefined eligibility criteria and was conducted consistently across all stages, reducing selection bias and ensuring that the evidence included was relevant to the research question and objectives.

4.2 Overview of Included Sources

Table 4.1 summarizes the design, setting, sample, and key findings of the ten most extensively analyzed sources underpinning this synthesis.

Table 4.1: Overview of reviewed studies

Study	Setting	Design & Sample	Measures	Key Findings
(D Kavvadas <i>et al.</i> , 2023a)	Greece - AUTh	Cross-sectional; N = 1,497 (2022); 3rd wave	DASS-21	Stress 36.1%, anxiety 33.5%, depression 42.8%; female sex, younger age,

Study	Setting	Design & Sample	Measures	Key Findings
				treatment history all risk factors (ORs up to 9.11).
(U Akram <i>et al.</i> , 2023)	UK - 5 universities	Cross-sectional; N = 1,408 (2018–2019)	GAD-7, PHQ-9, +6 more	43.8% anxiety, 47.1% depression, 44.2% insomnia, 37.3% suicide risk, 29.6% psychosis-risk, 34.1% loneliness; all inter-correlated ($r = 0.27–0.78$).
(M McLafferty <i>et al.</i> , 2017)	Northern Ireland -1 university	Cross-sectional; entering students	Standardized screens	Substantial depression/anxiety symptomatology at university entry; low treatment-seeking.
(Cogan <i>et al.</i> , 2025a)	UK - 4 nations	Scoping review protocol (JBI; PRISMA-ScR)	N/A protocol	No empirical results yet; identifies fragmentation and under researched groups; cites ONS (2023) 37% figure.
(C. C. Moura <i>et al.</i> , 2026b)	Brazil - 4 universities	Cross-sectional; N = 2,333 (2023–2024)	DASS-21	Depression 77.2%, anxiety 76.8%, stress 77.3%; income and scholarship protective.
(J A Antón-Ruiz, Bernabé and Heredia-Oliva, 2026)	Global - 63 studies	Meta-analysis; >255,000 students (2022–2025)	Multiple validated scales	Pooled: depression 45.1%, anxiety 43.6%, stress 45.6%.
(J Zhu <i>et al.</i> , 2021a)	Global - 176 studies	Meta-analysis; 1,732,456 participants (2020)	Multiple validated scales	Pooled clinically elevated: depression 30.6%, anxiety 28.2%; region and time significant moderators.
(P Peng <i>et al.</i> , 2023)	Global - 201 studies, medical students	Meta-analysis; ~198,000 students (2020–2022)	Multiple validated scales	Pooled: depression 41%, anxiety 38%, stress 34%, plus sleep disorder, PTSD, burnout, suicidal ideation.
(Akhtar <i>et al.</i> , 2020)	20 LMICs	Meta-analysis; 76,608 individuals (2009–2018, pre-pandemic)	BDI, CES-D, PHQ-9	Pooled pre-pandemic depression: 24.4%.
(Paiva <i>et al.</i> , 2025a)	Global - 62 meta-analyses	Umbrella review; 8,706,185 participants	AMSTAR-2 appraised	Pooled: mild/severe depression 35.4%/13.4%; mild/severe anxiety 40.2%/16.8%; sleep 41.1%; stress 36.3%.

Figure 3.2: Design of the ten sources analysed in depth

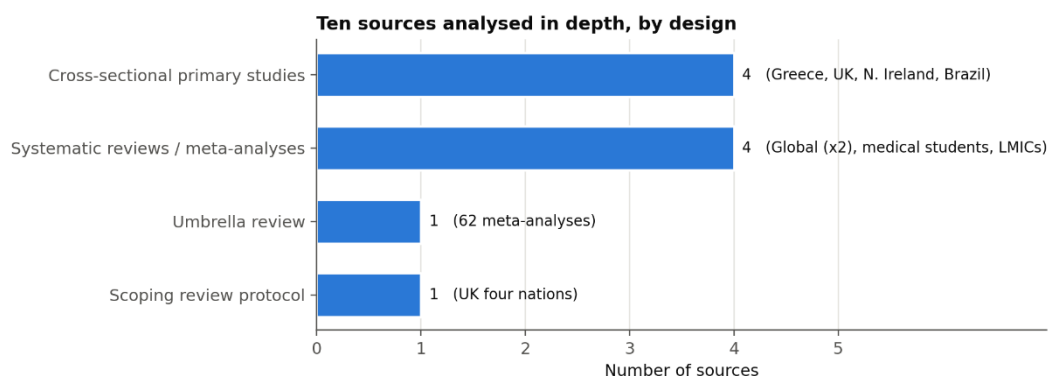


Figure 3.2 shows that the evidence analyzed in depth is split evenly between primary cross-sectional studies and systematic reviews or meta-analyses, with no longitudinal cohort studies or intervention trials among the ten sources. Causal conclusions therefore cannot be drawn from this evidence base.

4.3 Quality Appraisal Results (CASP)

Table 4.2 presents the results of the CASP appraisal for the ten sources analyzed in depth. Of the ten, four were rated high quality, five moderate, and one (the scoping review protocol) could not be rated because it reports no results. The meta-analyses scored well on search strategy and on appraising the quality of their own included studies, but all reported high heterogeneity, which weakens confidence in the precision of their pooled estimates. The single-country cross-sectional studies scored well on clarity of aims and on the use of validated instruments, but all three relied on convenience or self-selected online samples, and none could establish cause and effect.

Table 4.2: CASP quality appraisal results for the sources analyzed in depth

Source	Design / CASP checklist	Clear aim	Appropriate design	Recruitment / search	Valid measures / quality of included studies assessed	Confounders / heterogeneity addressed	Results precise	Applicable to UK students	Overall
Kavvadas et al. (2023)	Cross-sectional / Cohort (adapted)	Yes	Yes	No – convenience online sample	Yes – DASS-21	Yes – regression	Yes	Partly – Greece	Moderate
Akram et al. (2023)	Cross-sectional / Cohort (adapted)	Yes	Yes	No – self-selected; 83% female	Yes – 8 validated scales	Can't tell – descriptive/correlational	Yes	Yes – UK, pre-pandemic	Moderate
McLafferty et al. (2017)	Cross-sectional / Cohort (adapted)	Yes	Yes	Can't tell – one university	Yes – standardised screens	Can't tell	Yes	Yes – Northern Ireland	Moderate
Moura et al. (2026)	Cross-sectional / Cohort (adapted)	Yes	Yes	No – convenience sample	Yes – DASS-21	Yes – adjusted ORs	Yes	Partly – Brazil	Moderate
Cogan et al. (2025)	Scoping review protocol	Yes	Yes	Yes – planned	N/A	N/A	N/A	Yes – UK	Not rated
Zhu et al. (2021)	Meta-analysis / Systematic Review	Yes	Yes	Yes – multi-database	Yes	Partly – high heterogeneity	Partly	Partly – global	High
Peng et al. (2023)	Meta-analysis / Systematic Review	Yes	Yes	Yes – multi-database	Yes	Partly – high heterogeneity	Partly	Partly – medical students only	High
Akhtar et al. (2020)	Meta-analysis / Systematic Review	Yes	Yes	Yes – multi-database	Yes	Partly – high heterogeneity	Partly	Limited – LMICs, pre-pandemic	Moderate

Antón-Ruiz et al. (2026)	Meta-analysis / Systematic Review	Yes	Yes	Yes – multi-database	Yes	Partly – high heterogeneity	Partly	Partly – global	High
Paiva et al. (2025)	Umbrella review / Systematic Review	Yes	Yes	Yes – multi-database	Yes – AMSTAR-2; most included meta-analyses low/critically low quality	Partly	Partly	Partly – global	High (method); underlying evidence low

Note: Yes = criterion clearly met; Partly = met with reservations; Can't tell = not reported; No = not met; N/A = not applicable.

4.4 Theme 1: Prevalence of Stress, Anxiety, and Depression (Objective 1)

4.2.1 Country- and Setting-Specific Prevalence

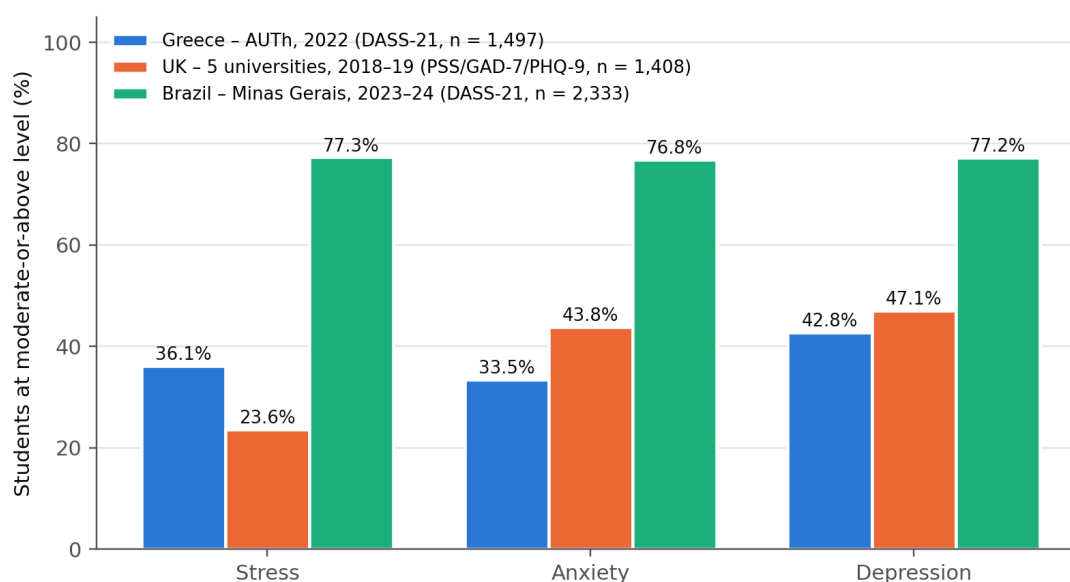
Table 4.3: Directly reported prevalence across three single-country studies

Outcome	Greece (AUTH, 2022)	United Kingdom (2018–19)	Brazil (Minas Gerais, 2023–24)
Stress (moderate+)	36.1%	23.6% “high” (PSS)	77.3%
Anxiety (moderate+)	33.5%	43.8%	76.8%
Depression (moderate+)	42.8%	47.1%	77.2%
Suicidal ideation / at-risk	Not directly measured	37.3%	Not measured
Loneliness	Not measured	34.1% “high”	Not measured
Sample size	N = 1,497	N = 1,408	N = 2,333

Depression, anxiety, and stress prevalence in the Brazilian sample (C. C. Moura *et al.*, 2026b) were markedly higher (76.8–77.3%) than in the Greek (33.5–42.8%) or UK (23.6–47.1%) samples, illustrating the scale of cross-national variability discussed further in Chapter 5. This variability is unlikely to be explained by instrumentation alone, since the Greek and Brazilian samples both used the same DASS-21 instrument

yet produced markedly different results; sample composition, timing relative to the pandemic, and underlying country-level differences in academic, economic, and healthcare context are each plausible contributing explanations that are explored further in Chapter 5.

Figure 3.3: Moderate-or-above stress, anxiety and depression in Greek, UK and Brazilian students



UK stress = % with 'high' score on the Perceived Stress Scale, so not directly comparable with the DASS-21 stress figures.

Figure 3.3 makes the scale of cross-national variation visible: the Brazilian sample (green) is roughly twice as high as the Greek and UK samples for every outcome, while the UK sample (orange) has the highest anxiety and depression of the two European samples despite being collected before the pandemic.

4.2.2 Pooled Meta-Analytic Prevalence Across Time Windows

Table 4.4: Pooled prevalence by meta-analysis data window

Meta-analysis	Data window	Scope	Depression	Anxiety	Stress
(Akhtar <i>et al.</i> , 2020)	2009-2018 (pre-pandemic)	37 studies; 76,608 students; 20 LMICs	24.4%	Not assessed	Not assessed
(J Zhu <i>et al.</i> , 2021a)	2020 (acute pandemic)	176 studies; 1,732,456 students; global	30.6%	28.2%	Not assessed
(P Peng <i>et al.</i> , 2023)	2020–2022	201 studies; ~198,000 medical students	41%	38%	34%

Meta-analysis	Data window	Scope	Depression	Anxiety	Stress
(Paiva <i>et al.</i> , 2025a)	Inception-2023 (umbrella)	62 meta-analyses; 8.7M participants	35.4% mild / 13.4% severe	40.2% mild / 16.8% severe	36.3%
(J A Antón-Ruiz, Bernabé and Heredia-Oliva, 2026)	2022-2025 (post-pandemic)	63 studies; >255,000 students	45.1%	43.6%	45.6%

Pooled depression prevalence rose across these time windows: 24.4% (pre-pandemic) → 30.6% (2020, clinically elevated cases only) → 35.4% mild / 13.4% severe (umbrella review spanning multiple periods) → 41% (2020–2022, medical students) → 45.1% (2022–2025, post-pandemic). Zhu *et al.* (2021) and Peng *et al.* (2023) each reported a statistically significant positive association between time and prevalence within their respective data windows. A comparable, though less pronounced, pattern is visible for anxiety, rising from 28.2% (2020) to 40.2% mild / 16.8% severe (umbrella review) to 43.6% (2022–2025), while stress prevalence was assessed less consistently across the earlier meta-analyses, precluding as clear a temporal comparison for that outcome specifically.

4.5 Theme 2: Risk and Protective Factors (Objective 2)

Table 4.5 summarizes the factors most frequently reported across sources that conducted risk-factor analyses or moderator analyses. As defined in Chapter 2, Section 2.2, odds ratios (ORs) above 1 indicate increased risk relative to the reference group, and values below 1 indicate a protective association.

Table 4.5: Risk and protective factors reported across sources

Factor	Direction	Supporting sources / detail
Female sex	Risk	(D Kavvadas <i>et al.</i> , 2023a) (ORs 1.62–2.07); (R H Salk, Hyde and Abramson, 2017), ~2:1 general population ratio); (Boyd <i>et al.</i> , 2015b) NOT significant in (J Zhu <i>et al.</i> , 2021a) pooled meta-regression.
Younger age / entry to university	Risk	(D Kavvadas <i>et al.</i> , 2023a) (M McLafferty <i>et al.</i> , 2017) (King <i>et al.</i> , 2021a)
Academic overload / heavy burden	Risk	(C. C. Moura <i>et al.</i> , 2026b) (OR 2.57 depression); (Pascoe, Hetrick and Parker, 2020a)

Factor	Direction	Supporting sources / detail
Psychiatric/psychological treatment history	Risk	Kavvadas <i>et al.</i> (ORs up to 9.11); Bendau <i>et al.</i> (2021); McLoughlin <i>et al.</i> (2023).
Financial hardship / socioeconomic disadvantage	Risk (economic instability) / Protective (higher income)	(C. C. Moura <i>et al.</i> , 2026b) (OR 0.55–0.66 for income);
Poor sleep / insomnia	Risk	(S Spyridonidis <i>et al.</i> , 2025) , 46.9% pooled);(Regli <i>et al.</i> , 2024b) ; (Yaghmour <i>et al.</i> , 2024b)
Smartphone / social media overuse	Risk	(Wacks and Weinstein, 2021b) ; (Feng and Dou, 2024b)
Loneliness / weak social support	Risk	(U Akram <i>et al.</i> , 2023) Akram <i>et al.</i> (2023): Loneliness (UCLA3) correlated positively with depression (PHQ-9) and anxiety (GAD-7), Pearson $r = 0.52-0.61$; [111]
Geographic region	Significant moderator	(J Zhu <i>et al.</i> , 2021a) ($p < 0.001$, lower East Asia); (J Zhu <i>et al.</i> , 2021a; J A Antón-Ruiz, Bernabé and Heredia-Oliva, 2026) ($p = 0.026$).
Time since pandemic onset	Significant moderator (rising)	(+0.16–0.18%/month); (Li <i>et al.</i> , 2022b) (+1.14–1.17%/month); (Gagné <i>et al.</i> , 2022a)

Female sex and academic overload were the most consistently reported individual-level risk factors across the primary studies. Geographic region and time since pandemic onset were the two factors that reached statistical significance as moderators in more than one meta-analysis. Notably, female sex and age were significant risk factors in single-study regression models (D Kavvadas *et al.*, 2023a) but were not significant moderators in pooled meta-regression of 176 studies, a discrepancy discussed further in Chapter 5. Lifestyle and behavioral factors, including sleep quality, smartphone use, and body mass index or food insecurity, were reported less consistently across sources than the demographic and academic factors summarized in Table 4.5, but where they were assessed the direction of association was uniformly toward increased risk, and none of the sources reviewed reported a protective association for any lifestyle factor of this kind.

4.6 Theme 3: Strategic Measures and Interventions (Objective 3)

None of the UK primary studies reviewed evaluated an intervention. Evidence on strategic measures therefore came from three kinds of source: review-level and trial-

based evidence on interventions, policy and service descriptions, and recommendations made by the prevalence studies themselves. Table 4.6 summarizes the measures identified and groups them by level of the Social Ecological Model.

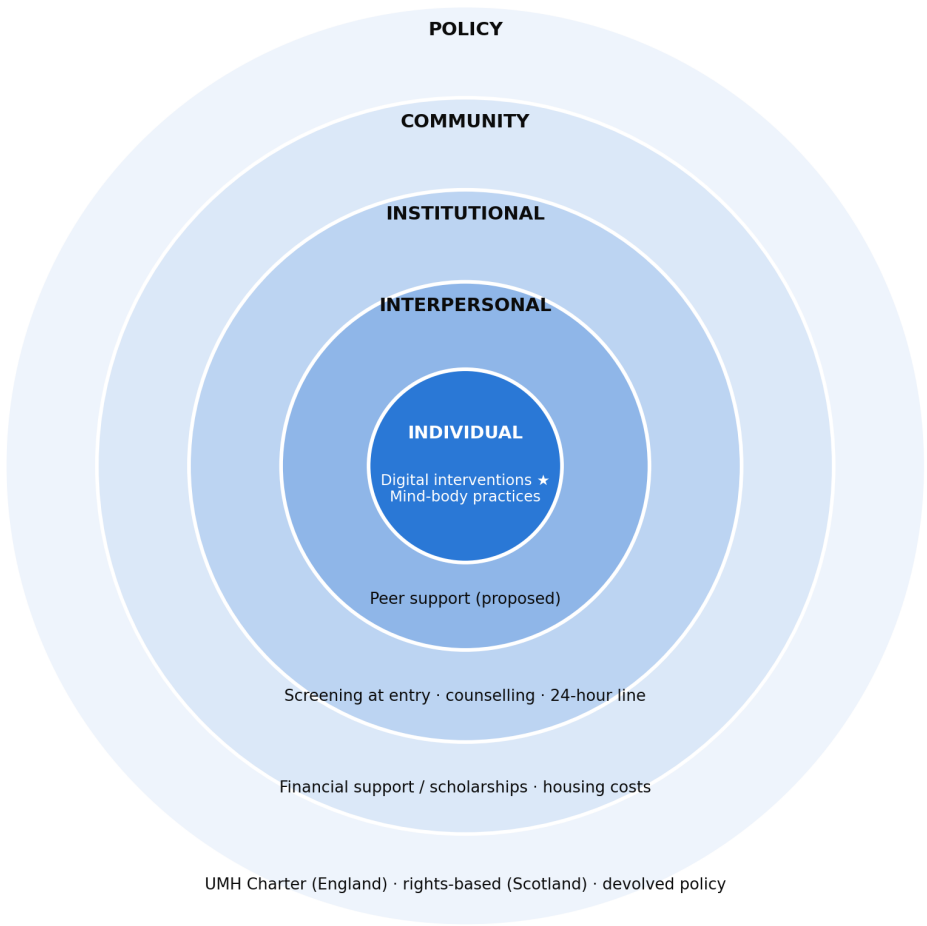
Table 4.6: Strategic measures reported across sources, by level of the Social Ecological Model

Strategic measure	SEM level	Source(s)	Reported finding	Type of evidence
Digital / app-based interventions	Individual	Madrid-Cagigal et al. (2025)	Medium reduction in depressive symptoms and smaller reduction in anxiety among students with mental health difficulties; fully automated formats comparable to therapist-guided for anxiety	Meta-analysis of RCTs
Mind-body practices (breathing, grounding)	Individual	Frausing, Flammild and Dahlgaard (2025)	Feasible, low-cost additions to support; regular practice important for stress and anxiety	Intervention study
Proactive, risk-informed screening	Institutional	Kavvadas et al. (2023); McLafferty et al. (2017)	Recommended because risk is high at entry and treatment-seeking low	Recommendation from prevalence studies (not tested)
24-hour support line; telepsychiatry; VR-based support	Institutional	Kavvadas et al. (2023)	24-hour line already operating at AUTH; others proposed as scalable	Service description (not evaluated)
Range of university programmes (counselling, peer support, psychoeducation)	Institutional	Worsley, Pennington and Corcoran (2022)	Many single-programme evaluations but little comparative evidence on which types work best	Review of reviews
Financial support / scholarships	Community / policy	Moura et al. (2026)	Scholarship receipt protective against anxiety after adjusting for family income	Cross-sectional (association only)
National frameworks: University Mental Health Charter (England), trauma-informed rights-based approach (Scotland)	Policy	Cogan et al. (2025); Student Minds (2023)	Approaches differ across the four UK nations; not yet compared	Protocol / policy report

Three findings stand out. First, digital interventions were the only strategic measure supported by a meta-analysis of randomized controlled trials (Madrid-Cagigal et al., 2025). Second, most institutional and policy measures were described or recommended rather than evaluated: screening, 24-hour support lines, and the four nations' policy frameworks were not tested against outcomes in any source reviewed. Third, the evidence on help-seeking shows that providing services is not enough on its own. Rates of service use among US college students rose between 2007 and 2017 but

did not keep pace with rising symptoms (Lipson, Lattie and Eisenberg, 2019), students in Northern Ireland reported low treatment-seeking despite high symptom levels at entry (McLafferty et al., 2017), and stigma, confidentiality concerns, and not knowing what support was available were the most common barriers to seeking help in a Saudi Arabian university sample (Alaqeel et al., 2023).

Figure 3.4: Strategic measures identified, mapped onto the Social Ecological Model



★ = supported by a meta-analysis of RCTs. All other measures were described, recommended or associated (not evaluated) in the sources reviewed. Few measures address community- and policy-level risk factors.

Figure 3.4 shows where each strategic measure acts. Only one measure, digital interventions at the individual level, is supported by a meta-analysis of randomized

trials. Measures in the outer rings, which address the financial, housing and policy conditions identified as risk factors in Theme 2, were described or recommended but not evaluated.

4.6.1 Outcomes Beyond Stress, Anxiety, and Depression

Table 4.7 compares prevalence of additional mental health outcomes reported across the UK sample, the medical-student meta-analysis, and the global umbrella review.

Table 4.7: Prevalence of outcomes beyond the core stress–anxiety–depression triad

Outcome	Akram et al. (2023) — UK	Peng et al. (2023) — medical students	Paiva et al. (2025) — global umbrella
Sleep disorder / insomnia	44.2%	52%	41.1%
Suicidal ideation (lifetime)	37.3% at risk	15%	20.3%
Psychological distress	Not a composite	58%	Not reported as composite
PTSD	Not assessed	34%	25.1%
Burnout	Not assessed	38%	Not reported
Eating disorder symptoms	Not assessed	Not reported	17.9%

Table 4.7 shows that, across the three sources that reported them, outcomes beyond stress, anxiety, and depression were common, but that they were measured unevenly. Sleep problems were the most consistently reported additional outcome and the only one measured in all three sources. Prevalence was similar across them: 44.2% of UK students met the threshold for probable insomnia (Akram et al., 2023), compared with 41.1% of students globally (Paiva et al., 2025) and 52% of medical students (Peng et al., 2023). The UK figure therefore sits close to the global average, while medical students report the highest burden, which is consistent with the demanding schedules and clinical placements of that group.

Suicidal ideation showed the widest spread, from 15% (Peng et al., 2023) and 20.3% (Paiva et al., 2025) to 37.3% in the UK sample. These figures are not directly comparable. The UK figure is the proportion scoring at significant risk on the Suicidal Behaviors Questionnaire-Revised, which combines lifetime ideation and attempts, frequency of ideation in the past year, disclosure, and the self-rated likelihood of future attempts, whereas the two international figures refer to lifetime suicidal ideation alone. The UK figure is therefore likely to capture a broader group of students than the others. Even so, it is the highest suicide-related figure in this review and is an important signal for UK institutions.

Psychological distress (58%), post-traumatic stress symptoms (34%), and burnout (38%) were reported among medical students, and post-traumatic stress symptoms (25.1%) and eating disorder symptoms (17.9%) were reported in the global umbrella review. None of these was measured in the UK sample, so no UK-specific estimate exists for them in the evidence reviewed here. This is a gap rather than evidence of absence: PTSD, burnout, and eating disorder symptoms each affected roughly one in five to one in three students where they were measured.

Finally, Akram et al. (2023) found that all eight outcomes measured in their UK sample were inter-correlated ($r = 0.27\text{--}0.78$), meaning that students with one difficulty were likely to report others as well. This pattern of co-occurrence is consistent with the disorder-overlap literature reviewed in Chapter 2, Section 2.3, and is interpreted further in Chapter 5, Section 5.5.

4.6.2 Population Coverage

Of the sources examined in depth, several reported samples that were disproportionately female (67–83% of respondents) and undergraduate (U Akram et al., 2023) (C. C. Moura et al., 2026b) (Li et al., 2022b) restricted its synthesis to medical students only, and (Paiva et al., 2025a) identified underrepresentation of graduate students and certain world regions as a limitation of the global evidence base as a whole. (Cogan et al., 2025a) scoping review protocol explicitly names mature, ethnic-minority, LGBTQ+, international, and neurodivergent students as populations that remain under researched across the wider UK evidence base. This pattern of underrepresentation is consequential rather than merely descriptive: because risk

factors such as academic overload, financial hardship, and loneliness are unlikely to affect all student subgroups equally, a UK evidence base skewed toward majority-population, female, undergraduate samples cannot be assumed to accurately characterize the mental health needs of, for example, international postgraduate researchers, mature students balancing caring responsibilities, or neurodivergent students navigating an assessment structure not originally designed with their needs in mind.

4.5 Quality of the Included Evidence

Applying the CASP domains summarized in Chapter 3, Table 3.3, the ten sources examined in depth in this chapter varied in the extent to which each methodological domain was fully satisfied. The large meta-analyses and the umbrella review (J A Antón-Ruiz, Bernabé and Heredia-Oliva, 2026) (J A Antón-Ruiz, Bernabé and Heredia-Oliva, 2026) (Paiva *et al.*, 2025a) (P Peng *et al.*, 2023) (J Zhu *et al.*, 2021a) each reported a formally registered protocol, a multi-database search strategy, and a structured quality appraisal of their own included primary studies, typically using tools such as the Newcastle-Ottawa Scale, the JBI Critical Appraisal Checklist, or AMSTAR-2 (Paiva *et al.*, 2025a) (Shea *et al.*, 2017b). These sources therefore satisfied the CASP domains relating to methodological transparency and rigor of analysis particularly well, though several, including explicitly flagged high between-study heterogeneity and, in (Paiva *et al.*, 2025a) case, classified the majority of the underlying meta-analyses as being of low or critically low methodological quality by AMSTAR-2 standards, a finding that tempers confidence in the precision, though not necessarily the general direction, of the pooled estimates reported in Table 4.3.

The three single-country primary studies satisfied the CASP domains relating to clear research aims, appropriate design for a prevalence question, and adequately powered sample sizes, each having calculated and met or exceeded a pre-specified minimum sample size. All three, however, relied on convenience or self-selected online samples rather than probability sampling, which limits confidence in the representativeness domain of the CASP framework and is consistent with the sampling-bias caveat raised for the UK evidence base more broadly by (Cogan *et al.*, 2025a). The scoping review

protocol (Cogan *et al.*, 2025a) satisfied the applicable CASP domains for a protocol document, including clearly focused aims and an appropriate, pre-registered methodology, but by definition could not yet be assessed against domains relating to the presentation and interpretation of findings, since data collection had not concluded at the time of publication.

4.6 Summary of Results

Across the evidence base, moderate-to-severe stress, anxiety, and depression prevalence ranged from approximately 24% (pre-pandemic meta-analytic baseline) to 77% (single post-pandemic country study), with global post-pandemic pooled estimates converging around 44–46%. Female sex, academic overload, and psychiatric treatment history were the most consistently reported individual risk factors; financial security and scholarship receipt were the main protective factors reported. Geographic region and time since pandemic onset were significant study-level moderators in multiple meta-analyses. Outcomes beyond the core triad were assessed in only a minority of sources, and several student subgroups remain underrepresented across the evidence base as a whole.

Chapter 5: Discussion

This chapter interprets the results presented in Chapter 4 in light of the wider literature reviewed in Chapter 2, organized where appropriate around the levels of the Social Ecological Model (Section 2.6). It considers what the observed prevalence levels and their apparent rise over time might mean; why the identified risk and protective factors might operate as they do; why prevalence differs so markedly by region; what the treatment-gap literature suggests about the practical significance of these findings; the populations and outcomes that remain poorly captured; and the strengths and limitations of the review itself.

5.1 Theme 1: Interpreting the Prevalence Findings

The prevalence figures reported in Chapter 4 are high by any standard, but they are not without precedent. The WHO World Mental Health International College Student survey, conducted before the COVID-19 pandemic across 19 universities in eight

countries, found a pooled lifetime prevalence of 31% for any of six common disorders among first-year students (Auerbach *et al.*, 2018) a figure broadly consistent with the earlier World Mental Health Surveys college-student analysis reporting comparable elevation relative to non-student peers (Auerbach *et al.*, 2018) . This pre-pandemic baseline is a useful anchor: it confirms that elevated psychological distress in university populations is not solely a pandemic-era phenomenon, but it is also considerably lower than the depression- and anxiety-specific prevalence figures reported by several of this review's post-pandemic sources (41–77%), suggesting that whatever baseline vulnerability exists among students has been substantially compounded by pandemic-related and post-pandemic stressors. It is worth being explicit about what this comparison can and cannot support: because the pre-pandemic and post-pandemic figures come from different instruments, samples, and countries, the difference between them is suggestive of a genuine rise rather than definitive proof of one, and the true increase could plausibly be smaller, or larger, than the raw figures imply once these compositional differences are accounted for.

The apparent temporal escalation identified in Table 4.3 deserves particular caution in its interpretation, because it is drawn from five meta-analytic and umbrella-review sources that differ in more than simply the time period of their included data: they also differ in geographic composition, population, for instance (Li *et al.*, 2022b) sampled medical students exclusively, inclusion thresholds, and the specific instruments pooled. (J Zhu *et al.*, 2021a) and (Li *et al.*, 2022b) each identified a statistically significant association between later data-collection dates and higher prevalence within their own pooled samples, which lends some support to a genuine temporal trend rather than a purely compositional artefact, and this is corroborated by UK-relevant longitudinal population data showing a comparable rise in distress among young adults in Great Britain (Gagné *et al.*, 2022a). However, both (J Zhu *et al.*, 2021a) and (Li *et al.*, 2022b) also acknowledge that heterogeneity across their included studies remained extremely high even after accounting for time as a moderator, meaning that time-in-pandemic explains only a modest share of the observed variability. A cautious reading is that prevalence has probably risen somewhat over the course of the pandemic and its aftermath, but the magnitude of

that rise cannot be precisely quantified from meta-analytic data alone; only genuine longitudinal cohort studies, such as the German and Irish data discussed in Chapter 2 (Bendau *et al.*, 2021b) (McLoughlin *et al.*, 2023b) could establish this with real confidence, and such designs remain the exception rather than the rule across the sources reviewed here.

5.2 Theme 2: Interpreting Risk and Protective Factors

5.2.1 Female Sex

Female sex emerged as the single most consistently reported individual-level risk factor across this review's sources (Table 4.4), a pattern well established in the broader psychiatric epidemiology literature independent of the pandemic. (Rachel H. Salk, Hyde and Abramson, 2017) meta-analysis of nationally representative samples found that women are approximately twice as likely as men to meet criteria for major depression, with the gender gap emerging as early as age twelve and persisting across adulthood, a pattern corroborated in large European population data (Boyd *et al.*, 2015a) and situated within broader sociological explanations of the gender-mental-health relationship (Rosenfield and Mouzon, 2013). This lends external support to the female-sex risk finding in (Dimitrios Kavvadas *et al.*, 2023) and (C. C. Moura *et al.*, 2026a). However, the fact that (Jenney Zhu *et al.*, 2021) pooled meta-regression of 176 studies did not find sex to be a significant moderator of pandemic-era prevalence is a genuine inconsistency worth sitting with rather than explaining away. One possibility is that female sex operates as a within-study risk factor, meaning that within a given sample women score higher, without being a between-study moderator, meaning that samples with a higher proportion of women do not necessarily show higher pooled prevalence, a distinction that individual-level regression models and study-level meta-regression are not designed to detect in the same way. Sampling composition may also play a role: several of this review's sources, including (Umair Akram *et al.*, 2023) and (Dimitrios Kavvadas *et al.*, 2023), drew samples that were 67–83% female, which may itself reflect differential survey participation by gender rather than the true population sex ratio.

5.2.2 Academic Overload and Psychiatric History

Academic overload was the second most consistently reported risk factor, appearing as a significant predictor in (C. C. Moura *et al.*, 2026a) and corroborated by international evidence linking academic and examination-related stress to poorer mental health across secondary and higher education more broadly (Pascoe, Hetrick and Parker, 2020b), and by evidence that anxiety, depression, and stress are each inversely associated with academic performance among undergraduates (Jehi *et al.*, 2024b). This is consistent with stress-based theoretical models of student mental health, in which chronic academic demands that exceed a student's perceived coping resources produce sustained physiological and psychological strain, and it maps directly onto the organizational level of the Social Ecological Model introduced in Chapter 2. Psychiatric or psychological treatment history was similarly prominent, with (D Kavvadas *et al.*, 2023b) reporting the single largest effect sizes in this review's entire evidence base for this factor. This is broadly consistent with a vulnerability-stress interpretation: students with a pre-existing history of psychological difficulty may be less resilient to the added academic and social stressors of university life, a pattern reinforced by longitudinal evidence that pre-existing anxiety and depressive symptoms strongly predict subsequent symptom trajectories under additional stress (Bendau *et al.*, 2021a) (McLoughlin *et al.*, 2023a).

5.2.3 Economic, Lifestyle, and Behavioural Factors

Family income and scholarship receipt were the main protective factors identified across this review's sources, both reported by (C. C. Moura *et al.*, 2026a). Higher family income and scholarship receipt both reduced the odds of elevated symptoms, while (Pu Peng *et al.*, 2023) separately identified economic instability as a risk factor, and childhood socioeconomic disadvantage has been shown to carry forward into university-age mental health via pathways including reduced impulse control and diminished social support (Kong *et al.*, 2025). Taken together, these findings point toward financial security operating as a buffer against student psychological distress, plausibly by reducing the additional burden of paid employment alongside study and the anticipatory stress associated with an uncertain financial future. Lifestyle and behavioral factors add a further dimension at the individual level of the SEM: poor sleep quality is both a consequence and a driver of psychological distress (Spyros

Spyridonidis *et al.*, 2025) ; (Yaghmour *et al.*, 2024a) , and excessive smartphone and social media use shows a comparable bidirectional relationship with depression and anxiety (Feng and Dou, 2024a) , suggesting that interventions targeting sleep hygiene and digital wellbeing may offer accessible, low-cost complements to more traditional counselling-based support.

5.3 Regional and Temporal Patterns

Both meta-analyses that tested geographic region as a moderator (Jenney Zhu *et al.*, 2021) ; (Pu Peng *et al.*, 2023) found significantly lower pooled prevalence in East Asian samples than in samples from other world regions, a pattern also echoed in (Josefa A. Antón-Ruiz, Bernabé and Heredia-Oliva, 2026) subgroup analysis. Zhu *et al.* (2021) and (Pu Peng *et al.*, 2023) both raise the possibility, in their own discussions, that this reflects underreporting or under-endorsement of psychological symptoms in East Asian cultural contexts, where mental illness may carry greater stigma or where symptom expression may be somatized rather than reported in psychological terms, rather than a genuinely lower burden of distress. This review's sources cannot adjudicate between a true regional difference and a measurement or reporting artefact, and the distinction matters considerably for policy: if the difference is measurement-driven, it would suggest current instruments under-detect distress in some cultural contexts, with corresponding implications for how universities in those regions, and international offices within UK universities recruiting students from those regions, should screen for and respond to student mental health need. This has direct relevance for UK higher education institutions specifically, given that Chinese and other East and South-East Asian students represent a substantial proportion of the international student population at many UK universities; (HESA, 2024) if standard English-language screening instruments systematically under-detect distress in students from these cultural backgrounds, current UK institutional screening practices could be inadvertently widening, rather than narrowing, an existing equity gap in who receives timely support.

Turning to temporal patterns, Section 5.1 considered whether the apparent rise in prevalence is genuine; the question here is what shape that rise has taken and what it

implies. The evidence reviewed does not suggest a single pandemic spike followed by a return to normal. In the Greek cohort, moderate-to-severe symptoms rose sharply between 2020 and 2021 and fell in 2022, but remained close to first-year levels rather than returning to a pre-pandemic baseline (Kavvadas et al., 2023). Four consecutive post-pandemic surveys in China similarly found that some outcomes improved while others had not recovered (Chen et al., 2024). At the pooled level, the highest estimates in this review come from the most recent, post-pandemic data window (2022–2025: depression 45.1%, anxiety 43.6%, stress 45.6%; Antón-Ruiz, Bernabé and Heredia-Oliva, 2026), and both Zhu et al. (2021) and Peng et al. (2023) found that prevalence increased with each month of data collection. Taken together, these findings point towards a partial recovery at best, with distress settling at a higher level than before the pandemic.

Three explanations, which are not mutually exclusive, may account for this. First, the rise began before the pandemic: population data from Great Britain show an upward trend in distress among young adults that predates COVID-19 and was accelerated by it (Gagné et al., 2022). Second, stressors that continued after the pandemic, notably the cost-of-living crisis, rising housing costs, and the need for paid work alongside study, act at the community and policy levels of the Social Ecological Model and did not end when restrictions were lifted. Third, reduced stigma and greater awareness may have increased students' willingness to report symptoms, so that part of the rise may reflect more disclosure rather than more distress. The UK evidence cannot yet separate these explanations, because the only multi-site UK prevalence survey reviewed collected its data in 2018–2019, before the pandemic (Akram et al., 2023), and no comparable post-pandemic UK survey was identified. For UK universities, the practical implication is that services should plan for sustained demand rather than assuming a return to pre-pandemic levels, and that repeated national surveys of student mental health are needed to track the trend directly.

5.4 Theme 3: Strategic Measures, the Treatment Gap, and Implications for Support Services

None of this review's core sources directly measured help-seeking or service utilization in the UK context specifically, which is a notable gap given how central this question is to translating prevalence data into service planning. External literature indicates that the gap between need and service use among college students is substantial: US data indicate a decade-long rise in the rate of mental health service utilization among college students, but one that has not kept pace with the underlying rise in symptom prevalence (Lipson, Lattie and (Lipson, Lattie and Eisenberg, 2019b) , and dedicated barrier research conducted in Saudi Arabia found that stigma, confidentiality concerns, and unfamiliarity with available services were the most commonly cited reasons for not seeking help (Alaqeel *et al.*, 2023) .(Margaret McLafferty *et al.*, 2017) UK-adjacent Northern Irish data similarly found low rates of treatment-seeking despite substantial symptom prevalence at university entry. If a comparable treatment gap applies to the wider UK student population, and there is no obvious reason to expect otherwise, then the prevalence estimates in Chapter 4 substantially understate the number of students whose distress is going unaddressed by existing support structures, reinforcing the urgency of the institutional responses called for by (Dimitrios Kavvadas *et al.*, 2023) and by (Cogan *et al.*, 2025b) UK-wide scoping review protocol.

One response that has gained empirical support is digital and app-based mental health intervention, which several of this review's sources gesture toward as a scalable option without directly testing it. A systematic review and meta-analysis of randomized controlled trials found that digital mental health interventions produced a medium-sized reduction in depression symptoms and a smaller but still meaningful reduction in anxiety symptoms among university students with existing mental health difficulties, with fully automated interventions performing comparably to therapist-guided formats for anxiety outcomes (Madrid-Cagigal *et al.*, 2025) . Complementary, lower-intensity approaches such as structured mind-body practices, including breathing and grounding techniques, have also shown feasibility as institutional additions to formal counselling provision (Frausing, Flammild and Dahlggaard, 2025) . This is a relevant complement to the interpretation offered above: if only a minority of distressed students actively seek formal, in-person support, low-barrier digital and

mind-body interventions may reach a proportion of the remainder who would not otherwise engage with campus counselling services at all, though such tools are unlikely to be sufficient on their own for students presenting with more severe or complex difficulties, such as the suicidal ideation or psychotic-like experiences captured by. (Umair Akram *et al.*, 2023) . A further practical consideration for UK institutions is cost and scalability: digital interventions typically require substantially lower per-student marginal cost than expanding face-to-face counselling capacity, which may make them a pragmatic first-line option for UK universities operating under the funding constraints discussed in Chapter 2, Section 2.5, provided they are positioned as a complement to, rather than a replacement for, adequately resourced in-person services for students with more severe presentations.

5.5 Population and Outcome Coverage Gaps

Section 4.4 established that outcomes beyond the core stress, anxiety, depression triad, and several specific student subgroups, remain thinly covered even across this review's combined evidence base. This matters because the outcomes that were assessed, including insomnia, suicidal ideation, loneliness, psychological distress, PTSD, and burnout, were all substantially inter-correlated where tested (Umair Akram *et al.*, 2023) , implying that a review or an institutional screening program that measures only depression and anxiety risks missing a meaningful proportion of at-risk students whose primary presentation is, for example, sleep disturbance or burnout rather than mood symptoms *per se*. (Cogan *et al.*, 2025b) explicit naming of mature, ethnic-minority, LGBTQ+, international, and neurodivergent students as under researched groups is not merely a methodological footnote: prior work outside this review's core sources indicates that international students face additional, distinct barriers to both help-seeking and formal diagnosis, including compounded pandemic-era stressors such as travel disruption and separation from family support networks (Lai *et al.*, 2020), which the largely majority-female, majority-undergraduate, single-nationality samples used in. (Umair Akram *et al.*, 2023) , (Dimitrios Kavvadas *et al.*, 2023) , and (C. de C. Moura *et al.*, 2026) are not designed to detect.

5.6 Strengths and Limitations of This Review

This review's principal strength lies in its explicit juxtaposition of UK-focused primary data against multiple international meta-analyses and umbrella reviews covering different time windows and populations, which allowed the pre-pandemic-to-post-pandemic prevalence trajectory described in Section 5.1 to be traced in a way that no single source could achieve alone. The inclusion of a formally registered UK scoping review protocol (Cogan *et al.*, 2025b) also allowed this review to identify evidence gaps prospectively, rather than only retrospectively inferring them from what was and was not reported in the empirical sources, and the explicit application of the Social Ecological Model (Section 2.6) provided a structured, multi-level interpretive framework that a purely descriptive prevalence summary would not have offered.

Nonetheless, several limitations temper the conclusions that can be drawn. First, cross-study and cross-instrument comparability is limited throughout: the DASS-21, GAD-7, PHQ-9, and other instruments used across the primary studies are all validated but not interchangeable, and differing severity cut-offs likely account for some of the prevalence variation reported in Tables 4.2 and 4.3. Second, none of the UK primary studies included in this review used a longitudinal design capable of establishing genuine within-person change over time, which limits confidence in the apparent temporal trend discussed in Section 5.1 to an association observed across, rather than within, samples; the German and Irish longitudinal data discussed in Chapter 2 (Bendau *et al.*, 2021a) ; (McLoughlin *et al.*, 2023a) are the partial exception, but neither was conducted in a UK sample. Third, as detailed in Section 5.5, the populations and outcomes captured by this review's UK sources are not representative of the full diversity of the UK student population, and the conclusions drawn here should be read as most applicable to female, undergraduate, majority-population students in the specific institutional contexts sampled, pending the completion of broader reviews such as (Cogan *et al.*, 2025b) . Finally, the contextualizing international literature was identified through supplementary citation-tracking of the reference lists of the core included studies rather than through an independently registered international search, and should therefore be read as illustrative, corroborating context rather than as an exhaustive, systematically searched account of the global literature in its own right.

5.7 Implications Across the Social Ecological Model

Revisiting the findings of Chapters 2 and 4 level by level through the Social Ecological Model (Section 2.6) makes the practical implications of this review more concrete than a flat list of risk factors would allow. At the individual level, the consistent role of sleep quality, smartphone and social media use, and pre-existing psychiatric history (Sections 2.2 and 5.2) suggests that universities have a legitimate role in psychoeducation and early screening focused specifically on these modifiable behaviors, rather than treating student mental health purely as a matter for reactive counselling once distress has already escalated. At the interpersonal level, the strength of the loneliness and social-support findings (Umair Akram *et al.*, 2023) (Surkalim *et al.*, 2022) points toward peer-mentoring and structured social-connection programs, particularly during the first-year transition period identified as a period of heightened vulnerability by both UK and international evidence; (King *et al.*, 2021b) (Margaret McLafferty *et al.*, 2017) ;;(Thompson, Pawson and Evans, 2021b)

At the organizational level, the academic-overload findings discussed in Section 5.2.2 imply that assessment design and workload distribution across a degree program are not merely pedagogical concerns but have a direct bearing on student mental health, a conclusion reinforced by the specific mechanism identified by (Xu *et al.*, 2025) linking anxiety to impaired academic task performance. This suggests that curriculum and assessment redesign should be considered a legitimate component of a university's mental health strategy alongside, rather than separate from, the provision of counselling services. At the community level, the financial-security findings discussed in Section 5.2.3 point toward housing costs, part-time employment conditions, and local cost-of-living pressures as determinants that sit substantially outside any individual university's direct control, but which nonetheless shape the baseline distress level with which students arrive on campus. Finally, at the policy level, the four-nations variation documented by (Cogan *et al.*, 2025b) suggests that a single, undifferentiated UK-wide policy response is unlikely to be optimal, and that devolved health and education policy differences should be treated as a genuine natural comparison opportunity for future research rather than an inconvenience to be averaged away, a point returned to in the recommendations set out in Chapter 6.

Chapter 6: Conclusion

6.1 Answering the Research Question

Taken together, the evidence reviewed in this dissertation indicates that stress, anxiety, and depression affect a substantial proportion of university students, from roughly a quarter to three-quarters depending on setting, instrument, and time period, with global post-pandemic pooled estimates converging around 44–46%. Female sex, younger age, academic overload, and a history of psychological or psychiatric treatment were the most consistently reported individual-level risk factors, while financial security and scholarship receipt were the main protective factors identified. Applying the Social Ecological Model showed that these individual-level factors do not operate in isolation but interact with interpersonal (loneliness, social support), organizational (academic workload, counselling provision), community (housing, local NHS capacity), and policy-level (devolved UK mental health strategy, tuition and funding structures) determinants, and the evidence base, though extensive, remains fragmented across countries, instruments, and student subgroups, limiting confidence in cross-national comparisons and leaving several populations under researched.

6.2 Reflection

This systematic review approach, structured around PRISMA 2020 reporting standards and CASP quality appraisal, allowed a more transparent and reproducible synthesis than a purely narrative approach would have offered, and the explicit use of the Social Ecological Model as an interpretive framework made it possible to move beyond a simple list of risk factors toward a structured account of where intervention is likely to be most effective. Reflecting on the process, a more exhaustive independent search

of the international comparator literature, rather than the supplementary citation-tracking approach used here, would have further strengthened the contextualizing evidence base; this is identified as a specific direction for future work in Section 6.3.

A further reflection concerns the balance struck throughout this dissertation between a tightly UK-focused systematic review and a much broader international literature. Narrowing the search exclusively to UK evidence, as originally considered, would have produced a smaller and more internally consistent evidence base, but would have left the resulting synthesis unable to address whether the patterns observed in UK samples are distinctive to the UK context or reflect a wider global pattern, a distinction that matters directly for how confidently UK policymakers can generalize from international intervention evidence. Retaining the broader international contextualization, while requiring more careful signposting throughout of which claims rest on UK-specific evidence and which rest on international comparator evidence, was judged to produce a more useful and more honestly caveated dissertation overall.

6.3 Recommendations

The recommendations below are organized by audience, and each is traceable to a specific finding discussed in Chapters 4 and 5 rather than presented as generic good practice.

For practice:

- Universities should consider proactive screening informed by known risk factors, including sex, year of study, and treatment history, rather than relying solely on self-referral.
- Support services should address co-occurring outcomes such as sleep, loneliness, and suicide risk alongside stress, anxiety, and depression, rather than treating these as entirely separate concerns.
- Institutions should evaluate digital, telehealth, and low-intensity mind-body interventions as scalable complements to in-person counselling, particularly for hard-to-reach groups such as international students.

For research:

- Future studies should prioritize longitudinal designs capable of establishing causal or predictive relationships between risk factors and outcomes, particularly within UK samples.
- Comparative research directly contrasting the four UK nations' distinct policy and funding contexts is needed, building on the scoping review protocol by Cogan et al. (2025).
- Research should deliberately sample under researched groups, including international, mature, LGBTQ+, and neurodivergent students, and should adopt a formally registered international search strategy to complement UK-focused evidence.

6.4 Contribution

This review contributes an explicit, PRISMA-guided synthesis of UK student mental health evidence, interpreted through the Social Ecological Model and situated within a substantially larger international literature spanning pre-pandemic baselines, acute-pandemic data, and post-pandemic meta-analyses. This juxtaposition, showing a plausible rise in prevalence from a 24% pre-pandemic baseline to figures approaching or exceeding 45% in recent post-pandemic syntheses, alongside a structured, multi-level account of associated factors, has not previously been drawn together in this form in the literature reviewed.

6.5 Concluding Remarks

The evidence assembled in this dissertation leaves little doubt that stress, anxiety, and depression represent a substantial and, on the available temporal evidence, probably worsening public health concern for university students in the United Kingdom and internationally. What the evidence cannot yet fully resolve is the precise combination of individual vulnerability, institutional practice, and wider social and economic conditions that produces this pattern, nor the extent to which currently available interventions are reaching the students who need them most. Addressing these open questions will require the kind of longitudinal, UK-specific, subgroup-sensitive

research identified throughout this review as currently lacking. In the interim, the consistency of the risk factors identified here, spanning female sex, academic overload, financial insecurity, poor sleep, and social isolation, provides universities and policymakers with a reasonably clear, evidence-based starting point for action, even while more definitive causal and comparative evidence continues to be gathered.

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Appendices

Appendix 1 - CASP Critical Appraisals

Table 1: CASP quality appraisal framework

CASP Assessment Criteria	Applied in this review
Clear statement of research aims	Yes
Appropriateness of methodology to the aims	Yes
Appropriateness of research design	Yes
Appropriateness of participant recruitment/sampling	Yes
Appropriateness of data collection methods	Yes
Consideration of ethical issues	Yes
Rigor of data analysis	Yes
Clarity of findings presentation	Yes
Value and applicability of the research	Yes

Key: Yes = criterion clearly met; Partly = met with reservations; Can't tell = not reported; No = not met; N/A = not applicable. CASP (2024) checklists appropriate to each study design were applied consistently across the ten sources analyzed in depth. Appraisal findings informed the interpretation and weighting of evidence; sources were not excluded solely on the basis of an appraisal outcome. The framework used to structure this appraisal is summarized in Table 1.

Table 2: CASP quality appraisal results for the sources analyzed in depth

Source	Design / CASP checklist	Clear aim	Appropriate design	Recruitment / search	Valid measures / quality of included studies assessed	Confounders / heterogeneity addressed	Results precise	Applicable to UK students	Overall
Kavvadas et al. (2023)	Cross-sectional / Cohort (adapted)	Yes	Yes	No – convenience online sample	Yes – DASS-21	Yes – regression	Yes	Partly – Greece	Moderate
Akram et al. (2023)	Cross-sectional / Cohort (adapted)	Yes	Yes	No – self-selected; 83% female	Yes – 8 validated scales	Can't tell – descriptive/correlational	Yes	Yes – UK, pre-pandemic	Moderate
McLafferty et al. (2017)	Cross-sectional / Cohort (adapted)	Yes	Yes	Can't tell – one university	Yes – standardized screens	Can't tell	Yes	Yes – Northern Ireland	Moderate
Moura et al. (2026)	Cross-sectional / Cohort (adapted)	Yes	Yes	No – convenience sample	Yes – DASS-21	Yes – adjusted ORs	Yes	Partly – Brazil	Moderate
Cogan et al. (2025)	Scoping review protocol	Yes	Yes	Yes – planned	N/A	N/A	N/A	Yes – UK	Not rated
Zhu et al. (2021)	Meta-analysis / Systematic Review	Yes	Yes	Yes – multi-database	Yes	Partly – high heterogeneity	Partly	Partly – global	High
Peng et al. (2023)	Meta-analysis / Systematic Review	Yes	Yes	Yes – multi-database	Yes	Partly – high heterogeneity	Partly	Partly – medical students only	High
Akhtar et al. (2020)	Meta-analysis / Systematic Review	Yes	Yes	Yes – multi-database	Yes	Partly – high heterogeneity	Partly	Limited – LMICs, pre-pandemic	Moderate
Antón-Ruiz et al. (2026)	Meta-analysis / Systematic Review	Yes	Yes	Yes – multi-database	Yes	Partly – high heterogeneity	Partly	Partly – global	High
Paiva et al. (2025)	Umbrella review / Systematic Review	Yes	Yes	Yes – multi-database	Yes – AMSTAR-2; most included meta-analyses low/critically low quality	Partly	Partly	Partly – global	High (method); underlying evidence low

Note: Yes = criterion clearly met; Partly = met with reservations; Can't tell = not reported; No = not met; N/A = not applicable.

Appendix 2 - Search Record Summary

Three electronic databases were searched, using the same limits in each: publication between January 2015 and December 2025, English language, and peer-reviewed journal articles. The full interface-specific search strings should be retained with the dissertation search record; the tables below record the databases searched, the record counts and the flow of records from identification to inclusion, in line with PRISMA 2020 (Page et al., 2021).

Table 3: Databases searched and records retrieved

Database	Platform	Date range / date last searched	Records
PubMed	NCBI / National Library of Medicine	Jan 2015 – Dec 2025; last searched	342
CINAHL Ultimate	EBSCOhost	Jan 2015 – Dec 2025; last searched	421
APA PsycINFO		Jan 2015 – Dec 2025; last searched	287
Total			1,050

Table 4: Record flow from identification to inclusion

Stage	Records (n)
Records identified from databases (PubMed 342; CINAHL 421; PsycINFO 287)	1,050
Duplicate records removed	215
Records screened by title and abstract	835
Records excluded at title and abstract screening	742
Full-text articles assessed for eligibility	93
Full-text articles excluded	68
– Non-UK study setting	24
– Inappropriate study population	15
– No relevant mental health outcome	12
– Review articles	9
– Conference abstracts or editorials	8
Studies included in the UK-focused narrative synthesis	25

International meta-analyses and umbrella reviews were identified separately by citation-tracking the reference lists of the included studies. These were used only to contextualize the UK findings and are not counted in the 25 included studies.