What's specific about the nature of mental health difficulties in students and how can this inform treatment?

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Declaration

I, Phoebe Barnett, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

This thesis explores how mental health service provision in university settings could be adapted to better meet the needs of students with mental health disorders. A systematic review and meta-analysis was conducted to assess the effectiveness of psychological interventions in student populations with, or at risk of, mental health disorders. The impact of adapting interventions for the particular needs of university students was also explored. Next, a cross-sectional survey of university students was conducted to explore differences in preferences for sources of support, and consider whether these may differ between international and UK resident students. Qualitative interviews and a confirmatory focus group further explored students' experience of mental health support while at university, and provided preliminary ideas for the types of changes in services that students would hope to see. Finally, analyses were conducted using a large dataset of people who use National Health Service (NHS) psychological therapies: outcomes were compared between students and adults of the same age who were employed using multivariate logistic regression analyses. For the student population only, the association between changes on measures of social functioning and treatment outcomes was also explored using Growth Mixture Model analysis. Together, the research suggests that the adaptation of current service provision to consider a number of additional student-specific factors contributing to mental health difficulties could usefully be applied in both university mental health services and NHS psychological services. Improved integration of support across these two settings could also significantly contribute to improved university student well-being and mental health.

Impact Statement

The findings from this thesis have the potential to inform mental health policy and practice, as well as highlighting areas for further research. These findings could be utilised by university mental health services and NHS and related mental health services. The following considerations may impact directly on university mental health service organisation planning:

1) The finding that students often utilise support from informal contacts along with the finding that social functioning may be related to treatment effectiveness, suggests that provision of evidence based psychological therapy could be enhanced with additional social support including interventions which facilitate students to engage in social aspects of university and thereby support the development of improved social relations with peers.

2) Student reports of 'getting lost in the system' and 'feeling abandoned' by long waiting times, considered with the fact that they are significantly less likely to experience positive treatment outcomes after psychological therapy suggests the benefit of a re-organisation of university services, for example through integration of care pathways with the NHS and provision of needs and evidence-based support in university services. Doing so could support a service-wide adaptation of care for students to account for contextual factors of importance such as disrupted term-time, academic stress and lack of social support. This whole system approach could contribute to improved outcomes in psychological therapy services and streamline pathways into specialised care for those who need it.

The benefits of such service adaptations include improved treatment outcomes, reduced waiting times, and less attrition from mental health treatment and potentially from university for students. Findings particularly from student reports of experiences of care also bring into focus the significant contribution that including service user voices in service planning can make, and this should be common practice in the future design and delivery of student mental health services. Such adaptions could additionally reduce the burden on university mental health centres due to support by a wider network of support options.

Key areas for future research were also identified including the need to explore the causal role of social support in mental health problems and recovery. This could be achieved through cross-lagged panel modelling and the design of randomized controlled trials specifically designed to explore such mechanisms and could also provide further evidence for the need to consider social factors in treatment provision. Furthermore, additional research will also need to explore how best to integrate social support with existing mental health treatment. There may be some utility in modular approaches to additional support for this purpose.

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Chapter 1: General Introduction

1.1   Student mental health: what is the extent of the problem?

Mental health problems are highly prevalent among young people and particularly students (Auerbach et al., 2016; Blanco et al., 2008; Cvetkovski, Jorm, & Mackinnon, 2019; Knapstad et al., 2021), highlighting the importance of improving mental health treatment and support within university settings. Systematic reviews have reported that the prevalence of depression and anxiety disorders is around 25% in students (de Paula, Breguez, Machado, & Meireles, 2020; Ibrahim, Kelly, Adams, & Glazebrook, 2013; Sheldon et al., 2021), which is higher than the prevalence reported in the general population (12.9%; Lim et al. (2018)). Further, the experience of mental health symptoms while at university is not limited to anxiety and depression, with one in five students showing elevated levels of eating disorder symptoms (Lipson & Sonneville, 2020), and reports of high rates of suicidal ideation (Mortier et al., 2018; Rodríguez & Huertas, 2013). Together, this indicates that a substantial number of students are likely to need mental health support and treatment during their time at university.

The peak age for the onset of mental health disorders is late adolescence into early adulthood, with 75% of people who will develop a mental health disorder developing it by the age of 25 (Kessler et al., 2005). As over two thirds of students who enrol in higher education also do so by the age of 25 (HESA, 2021), this means that many are at their highest risk of experiencing either ongoing symptoms of mental health problems or the onset of a disorder. The social and environmental changes which accompany attendance at university may contribute to this increased risk of mental health disorders, in addition to the intellectual challenges. As the number of students increase and the demands associated with attendance at university evolve, the numbers of students reporting mental health problems appears to be increasing, with approximately five times more first year students disclosing a mental health problem between 2015 and 2016 than between 2006 and 2007 (Thorley, 2017). Similarly, results from a US survey (Healthy Minds Network) reported that while 20% of students screened positive for generalized anxiety disorder and 25% screened positive for depression in 2015, 31% and 36% of students screened positive for

generalized anxiety disorder and depression, respectively, in 2019 (Healthy Minds Network; Lipson, Lattie, & Eisenberg, 2019; Morris, Feldpausch, Inga Eshelman, & Bohle-Frankel, 2019). There have also been reports that the severity of mental health problems in students is increasing: between 2007 and 2017, use of psychiatric emergency services by a large sample of US college students increased three-fold from 0.3% to 1% of the total sample (Lipson et al., 2019), mirroring earlier reports of this trend from university treatment providers (Gallagher, 2012). However, this increasing demand for mental health treatment has not been adequately met across the university sector (Auerbach et al., 2016; Jaworska, De Somma, Fonseka, Heck, & MacQueen, 2016), with evidence suggesting that psychological distress in the student body does not fall below pre-entry levels at any point during university, and instead increases as terms progress (Bewick, Koutsopoulou, Miles, Slaa, & Barkham, 2010; Pitt, Oprescu, Tapia, & Gray, 2018).

Given that the experience of symptoms of mental health problems impacts on academic achievement, and is associated with increased risk of dropping out from university (Sheldon et al., 2021), it is paramount that effective treatment and support is provided within university settings.

1.2   Why is mental health a problem for young people and students?

Mental health problems in students are related to a number of different factors, not all of which may be specifically related to university attendance. For example, the prevalence and complexity of mental health disorders also increases during adolescence (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003), suggesting that many students may experience a mental health disorder which develops *before* attending university. It has also been argued that when comparing students to non-students of the same age, few differences exist (Tabor, Patalay, & Bann, 2021). This instead supports arguments that age may be a more important factor than university attendance in the prevalence of mental health disorders in students.

However, it is likely that a number of contextual factors which may be relevant for many young people are particularly so in students. For example, one possible factor related to the increased prevalence of mental health disorders among young adults

could stem from the transitional nature of the time between adolescent and adult life, with a number of changes taking place which can both exacerbate or reverse the influence of more distal childhood experiences (Conley, Kirsch, Dickson, & Bryant, 2014; Curtis & Cicchetti, 2003; Schulenberg, Sameroff, & Cicchetti, 2004). While this transition is not limited to attending university, this could be a particularly salient example of such a change, given the change in geographical location that often is associated with it, and the consequential separation from support and intensifying of existing vulnerabilities to developing mental health disorders. Several models relating to this have been proposed to facilitate understanding of the influence of multiple factors - environmental, social, and developmental - on the risk of developing mental health disorders in students. Schulenberg's (2004) 'systems perspective' argues that changes in a person, their context, or the interaction between the two can result in psychopathology through the stressors resulting from these changes. Emerging adulthood is viewed as a time of heightened risk due to additional social disruption (Conley et al., 2014). Though personal resources such as resilience may have some sway in predicting adjustment levels (Parker, Duffy, Wood, Bond, & Hogan, 2005), these resources can become depleted through shifts in social context such as moving away from friends and family (Conley et al., 2014). This is of particular relevance since young adults are most likely to seek support from their family and friends in the first instance for mental health issues (Quinn, Wilson, MacIntyre, & Tinklin, 2009).

In addition, emerging adults, like youth, are still experiencing neurobiological changes such as synaptic pruning and myelination of intracortical and mesolimbic dopamine systems (Schulenberg et al., 2004; Spear, 2000). These neurobiological factors may also impact on the developmental course of mental health disorders, and in turn impact attendance at university. Wood et al. (2018) therefore argued that a more complex model of mental health disorders at this age is required. The 'Life course health development model' argues that development is influenced by macro (historical and social influence), meso (family support) and micro (cognitive, personality and emotional development) influences, and that these influences are time sensitive and affected by adaptability to environments.

1.2.1 Social Influence

The meso level influences such as family environment described in Wood et al., (2018)'s work have been shown to play an important role in developmental psychopathology. Finan, Ohannessian, & Gordon (2018) conducted a longitudinal study and found that depressive symptom trajectories from adolescence to emerging adulthood were influenced by adolescent communication, peer support and sibling warmth and hostility. These 'social support' systems can alter dramatically when young adults attend university away from home as they attempt to engage in new relationships (or in some instances, fail to form new relationships), in new social settings alongside the physical and cognitive changes that co-occur (Smetana, Campione-Barr, & Metzger, 2006). Support from others is strongly linked to mental health and well-being: a lack of social support was found to more than double the odds of depression in a systematic review, making it the strongest predictor of depression in university students apart from multiple comorbid mental health problems or parental mental health problems (Sheldon et al., 2021).

Social influences which contribute to social support such as peer relationships, parental support and social isolation have also been presented as key factors in determining help-seeking behaviour among university students. Outside the specific student experience, several models have been put forward to explain reasons for not seeking formal mental health support, such as 'The Network Episode Model' (Pescosolido, 1991), which states that an individual understands their mental health problems through their social interactions and cultural routines, and as such seeks help in a process bound by this context and social networks. This model argues against deterministic notions of individual factors being long-term drivers of help-seeking, and instead conceptualises the act of seeking support as a multi-faceted decision which is arrived at through the process of coping with symptoms using the social supports available. Pescosolido, Gardner, & Lubell (1998) further argued that friends and family are key influencers in help-seeking. This may shed light on the lack of help-seeking for mental health symptoms observed in the student population (Ennis et al., 2019). Biddle et al., (2007) posited that in young people, conceptualisation of what should be considered 'worthy' of seeking help forms the foundations of their behaviour. A distinction is made between normal, inevitably

experienced distress and "real" distress which is seen as abnormal and permanent. Only real distress is considered to require help and is characterised by an inability to cope. As such, normal distress becomes seen as coping and real distress only considered once help is sought, and so students continue to avoid help-seeking because examples of managing to cope despite distress serve as evidence that distress is not real. Fear of stigmatisation for seeking help for normal levels of distress also influences decisions- Biddle et al. (2007) provide qualitative data suggesting that students fear overreacting or seeking help for a "false alarm", and have a lack of objective threshold for when distress becomes "real" and in need of treatment. In this manner, Biddle et al. (2007) argue that students shift their conceptual understanding of the severity required to seek help, viewing help-seeking as the gateway to long-term irreversible mental illness. More recent studies have also supported this association between self-identification and actual help-seeking, highlighting the important detrimental effect of a perception of coping as a sign of wellness in prevention of help-seeking (Park, Andalibi, Zou, Ambulkar, & Huh-Yoo, 2020), indicating that despite efforts to improve mental health literacy and reduce stigma within universities in recent years (Reis, Saheb, Moyo, Smith, & Sperandei, 2021), this may still present as a barrier.

1.2.2 Additional risk factors

As with all populations, additional risks can interact with contextual stressors to increase susceptibility to mental illness. Some of these are generic factors, affecting all ages, while others have a heightened impact during emerging adulthood and the transitions accompanying university attendance. Both forms of these factors will be discussed here. One example of a factor which may have a heightened impact during young adulthood in particular is loneliness, which is intrinsically linked with the aforementioned role of social support in mental health and the transition to university. Although other age groups, such as older adults are also at a high risk of experiencing loneliness and the associated impacts on mental health (Cudjoe et al., 2020), young adults remain among the most lonely (Lin & Huang, 2012; S. Williams & Braun, 2019), which may be linked to a perceived lack of social support. Loneliness is also correlated with learning burnout in students (Lin & Huang, 2012) and increased prevalence of a variety mental health disorders, most notably

generalised anxiety disorder, depression, phobias and obsessive compulsive disorder (Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006; Hawkley & Cacioppo, 2010; Meltzer et al., 2013; Sax, Bryant, & Gilmartin, 2004). As such, loneliness can be considered a key risk factor for mental health problems while at university, and something which should be a clear focus for both preventative intervention (particularly for newly arriving students and international students) and possibly for treatment.

Furthermore, resilience, a term used to describe the successful adaption to challenging circumstances (Hartley, 2011; Wood et al., 2018), provides students with the capacity to acclimatise to stressful events such as life transitions, which can generate a buffer from the potentially harmful impacts of the disruption inherent in moving away from home. It therefore follows that poor levels of resilience could contribute to increased risk of mental health problems. Research has shown that resilience boosting behaviours such as exercising (Ekeland, Heian, & Hagen, 2005) and self-compassion (Neff & Lamb, 2009) can protect against mental health problems and contribute to an improvement in wellbeing, as can other flexible and positive coping strategies (DeRosier, Frank, Schwartz, & Leary, 2013). Environmental factors such as supportive family relationships have also been shown to contribute to resilience in young people and therefore likely continue to influence the resilience of university students (Lereya et al., 2016). Moreover, since social connections are positively correlated with resilience (DeRosier et al., 2013), loneliness could influence mental health through reduction in resilience. Furthermore, even when controlling for the levels of stress being experienced by students, resilience still promotes positive mental wellbeing when students move to university (DeRosier et al., 2013). With such clear influence in mental health, student mental health support may be more effective when also considering what can be done to encourage participation in resilience-boosting activities.

Risk of mental health problems is further confounded by the high rates of alcohol, substance misuse and gambling that accompany many students' experiences of higher education (Blanco et al., 2008; Nowak, 2018). University students are significantly more likely to have an alcohol use disorder than same-age peers who do not attend university (Blanco et al., 2008; Prosser, Gee, & Jones, 2018), despite

the fact that one study showed that adolescents on the trajectory to university attendance tend to drink less than their peers who do not go on to attend university (Brown et al., 2008). Though often considered a normal part of university life, and shown not to increase the odds of depression in one meta-analysis of student samples (Sheldon et al., 2021), as with any comorbidity, alcohol, gambling, and drug use while at university adds an additional dimension to consider within prevention policies at universities.

Other risk factors for students are less modifiable, and may also increase risk in the general population as well as in students specifically, such as demographic characteristics. Being from a minoritized ethnic background has frequently been cited in the literature as a risk factor for poor mental health outcomes for adults (Barnett et al., 2019; Miranda, Snowden, & Legha, 2020). Although within the (limited) student literature the relationship is less clear, results from two large cohort studies have found that compared to white students, all ethnic minority groups had an increased risk of depression and all except those from Asian backgrounds had an increased risk of anxiety (Eisenberg, Hunt, & Speer, 2013) and that diagnosis and treatment was lower in ethnic minority students compared to white students, which is consistent with the general population (Lipson, Kern, Eisenberg, & Breland-Noble, 2018), further perpetuating risk for students from ethnic minority backgrounds.

Being female also places students at an increased risk for experiencing mental health problems, such that women are approximately twice as likely to develop symptoms of depression than men (Finan et al., 2018; Lim et al., 2018), a trend also shown specifically during emerging adulthood (Lopez Molina et al., 2014). Although this trend of more depressive symptoms in women becomes less pronounced over time, during emerging adulthood it is particularly prominent (Finan et al., 2018; Girgus & Yang, 2015). In a university-specific context, the disruption in social support experienced during this time (Conley et al., 2014) may also disproportionately affect women, since measures of adjustment to university in females have been found to be more negatively affected by social support than males (Conley et al., 2014; Kendler, Myers, & Prescott, 2005). In addition, female young adults are both more likely to receive mental health treatment services, *and* self-report unmet need for services (Cadigan, Lee, & Larimer, 2019), a pattern also predicted by being from a

sexual minority (Cadigan et al., 2019; Dunbar, Sontag-Padilla, Ramchand, Seelam, & Stein, 2017). However, there are some mental health disorders which males are at a higher risk of experiencing, such as problems with alcohol abuse or externalizing disorders such as conduct disorder (Rosenfield & Smith, 2010). These demographic risk factors highlight the necessity of co-production with diverse users of mental health services when considering how best to improve mental health service provision.

The number of students attending university is increasing, with over 2.4 million students in the UK attending university In 2020/2021 (Universities UK, 2021). Furthermore, entry to university is now available for certain groups who may have previously been excluded from university, which is a positive step towards providing access to education for all (Universities UK, 2018). For example, access to university is no longer saved only for the children of rich, highly educated parents. However, socioeconomic status is also a key indicator of who may be at increased risk of mental health disorders (Pedrelli, Nyer, Yeung, Zulauf, & Wilens, 2015). This means that particularly those students without strong financial support may struggle under the added monetary and social demands that university brings (Hordósy & Clark, 2018). In support of this, undergraduate students with debt and monetary concerns have an increased risk of depression, anxiety and even psychosis (Andrews & Wilding, 2004; McCloud & Bann, 2019; Richardson, Yeebo, Jansen, Elliott, & Roberts, 2018; Sheldon et al., 2021). As previously mentioned, students with pre-existing mental health disorders are now also able to access university (Stein, 2013; Universities UK, 2018), although this also has detrimental impacts on student wellbeing if students are not adequately supported to cope with their diagnosis (Gallagher, 2012).

1.3   What do current university mental health services offer?

University, in principle, provides an ideal setting in which to address mental health (Zivin, Eisenberg, Gollust, & Golberstein, 2009), with the possibility of providing integrated provision of support and early intervention for mental health problems (Auerbach et al., 2016; G. C. Patton et al., 2016). As a result, there is an opportunity to intervene early in the course of the development of mental health disorders for a

large proportion of the population through both prevention and treatment and, in the UK at least, there has been an increasing focus on this issue with pressure on universities to provide evidence that they are providing effective services (Broglia, Millings, & Barkham, 2018; Randall & Bewick, 2016).

Universities are faced with a number of challenges in the development of a more preventative and proactive approach to services. Often short term-times, especially for undergraduates, and long holidays mean that for many students, large parts of the year are spent away from university services to return home to family (Broglia et al., 2018), which can result in many weeks without effective mental health support. Other current challenges include the common practice of limiting provision of psychological interventions to six sessions (Gavin, 2021) as a result of the ongoing rising demand and a lack of resources (Broglia et al., 2018; Gavin, 2021; Mair, 2015), and a limited understanding of national guidance (e.g. guidance for depression; National Institute for Health and Care Excellence (2022)). This combination of increased demand within limited timeframes has also meant that waiting times can be long, despite limits on sessions (Mowbray et al., 2006), with some students entering a "revolving door" situation of multiple short counselling episodes (Gavin, 2021).

Development of student specific models of intervention has progressed slowly compared to other services for adults and children (G. C. Patton et al., 2016). Poor coordination of NHS services for young people and university support is a problem that often results in a lack of continuity in treatment for those who were receiving care prior to attending university (Wood et al., 2018). Similarly, collaboration between staff responsible for student education with staff responsible for student health can be problematic (Wood et al., 2018) and so recovery could be inhibited by a lack of understanding on the part of academic staff.

1.3.1 Models of care provided within the university setting

Within this context, university support has historically been primarily individual short-term interventions provided by mental health counsellors, which can include both low intensity and high intensity support interventions (Broglia et al., 2018; Randall &

Bewick, 2016). In the past ten years there has also been an increasing reliance (and perhaps even more so in the last two years given the COVID-19 pandemic) on self-help, peer support and internet-based cognitive behavioural therapy (iCBT), as these can be provided within a more flexible time-frame, and in the case of self-help and iCBT, outside of usual university counsellor working hours (Hersch et al., 2022; Mair, 2015). However, there is some debate as to how effective such interventions are within university counselling services (Lehtimaki, Martic, Wahl, Foster, & Schwalbe, 2021), despite national guidance indicating that they can be of benefit (National Institute for Health and Care Excellence, 2022). The variation in models of care used by universities, along with inconsistency in routine outcome monitoring also creates a challenge for quality assurance (Downs, Galles, Skehan, & Lipson, 2018; Morris et al., 2019).

Models of service delivery developed specifically for emerging adults and students have generally been extrapolated from the limited evidence base available for young people. There are few models for mental health in young people (Brimblecombe et al., 2017), and as previously outlined, it could be problematic to generalise the broader developmental trajectory of young people's mental health and wellbeing to that of students attending university. However, some examples of models of service delivery which do consider age in their design and implementation have been developed, reporting increases in acceptability and engagement (Balmer & Pleasence, 2012) and even reduced hospital use over prolonged (2-3 years) follow up when provided to young people at high risk of psychosis (Brimblecombe et al., 2017). This lends support to the argument that a re-structuring of treatment and provision of support at university may allow universities to build on the prevention strategies in place through treatment models which will encourage students to start and continue treatment.

1.3.2   *Not all students utilise the help on offer*

Despite the fact that there has been investment in improving accessibility to mental health services, some students continue to have difficulty in seeking help (Ennis et al., 2019). Previous research has shown that less than half of students demonstrating significantly elevated symptoms or a diagnosable disorder receive

treatment (Auerbach et al., 2016; Eisenberg, Hunt, & Speer, 2012). Although recently rates of help-seeking within the student population have increased, so too have rates of mental health diagnosis (Lipson et al., 2019). Furthermore, attrition rates can be as high as 67% for psychological interventions in student samples (Hall, Brown, & Humphries, 2018), compared to 52.9% of general population individuals aged 18-35 who do not finish treatment within NHS psychological services (NHS Digital, 2020), and these interventions form a significant proportion of available support (Mowbray et al., 2006). There have been a number of explanations put forward for this, including stigma and embarrassment (Clement et al., 2015; Gulliver, Griffiths, & Christensen, 2010), concerns about confidentiality (Gulliver et al., 2010) and a lack of understanding or insight of students into the symptoms they experience (Gulliver et al., 2010; Rickwood, Deane, Wilson, & Ciarrochi, 2005). Of particular concern is the aforementioned suggestion of normalisation of distress in the university setting (Biddle et al., 2007; Farrand, Perry, Lee, & Parker, 2006), meaning that students feel their symptoms are insufficiently severe to seek support. Farrand et al., (2006) and Regehr, Glancy, & Pitts, (2013) also discussed the possibility that many students favour self-reliance, suggesting that self-help may be more appealing to those who are wary of seeking help from professionals. Indeed, young people have expressed concerns about professional treatment providers, such as that they will be too judgemental, will lack insight into the experiences of young people or will be too busy to properly listen (Gulliver et al., 2010).

On the other hand, some students who do wish to seek help are unsure of how to begin initial contact or conversely are afraid to do so (Barker, Olukoya, & Aggleton, 2005; Gulliver et al., 2010; Rickwood et al., 2005). In support of this, Rickwood et al (2005) found that young people who have established mental health support relationships in the past are more likely to seek help in the future, suggesting that improved information and guidance to 'demystify' the process of accessing mental health support when students arrive at university may be a simple, universal approach to encouraging help-seeking in those who are experiencing symptoms of mental health disorders for the first time.

1.4 What might need to be considered in university mental health treatment provision?

1.4.1 Universal prevention

Universal prevention programmes target the general population (or a subset of the general population, for example students) who have an average (or variable/unknown) probability of developing a mental health problem (Haggerty & Mrazek, 1994; Springer & Phillips, 2007). University mental well-being policies largely focus on prevention through universal health promotion (Universities UK, 2018). Since young people attending university are at an increased risk of mental disorder compared to other age groups (Cadigan et al., 2019; Westerhof & Keyes, 2010), universal approaches to prevention in student populations could be a useful way of easing the burden on mental health treatment services by targeting more general protective factors for the student population such as promoting environments and behaviours that build resilience (Stefan, Capraru, & Szilagyi, 2018), and have been reported as useful for young people (Fusar-Poli et al., 2021). Such an approach might be considered a "whole person" approach, with more focus on positive mental health (Parcover, Mays, & McCarthy, 2015) rather than compartmentalisation of discrete difficulties which need treatment. For example, social skills training programs could have some effect in the prevention of anxiety and depression (Conley, Durlak, & Kirsch, 2015) and can be administered digitally (Conley, Durlak, Shapiro, Kirsch, & Zahniser, 2016). Transitional disruption in social support may therefore be a useful risk factor to universally target upon starting university (Conley, Travers, & Bryant, 2013; Mattanah et al., 2010).

Universal strategies could also be a particularly valuable means of supporting the uptake of knowledge regarding available services for students. For example, mobile-based interventions have been found to increase student awareness of the resources available at their university, with some additional evidence of utility in prevention of alcohol and nicotine misuse (K. F. Johnson & Kalkbrenner, 2017).

Despite this, other forms of universal prevention were of limited efficacy in Conley et al.'s meta-analysis (2015), and available evidence suggests smaller effect sizes than more targeted approaches (Cook, Mostazir, & Watkins, 2019; Harrod, Goss,

Stallones, & DiGuiseppi, 2014; Stice, Shaw, & Marti, 2007). Prevention is an important facet of what should be involved in a university mental health support system, but cannot be considered adequate without relevant additional treatment interventions. Universal treatment strategies such as wellbeing campaigns might also place additional strain on services, while being of limited use in targeting high risk populations (Arie, 2017; Barkham et al., 2019) and therefore their wider impact on the system may need to be considered.

Furthermore, since each individual's risk is shaped inherently by their specific experience, cognitive maturation, social support and demographic characteristics (Conley et al., 2014; Schulenberg et al., 2004; Wood et al., 2018), it follows that universal approaches should only be considered as part of a wider solution to university mental health provision, as it is unlikely to resolve problems in high risk groups such as people with ongoing mental health difficulties. Tailoring intervention strategies to the challenges faced by each individual, and avoiding the generalisation of assumptions of treatment for children or adults, is necessary to fully combat mental health problems in this population (Wood et al., 2018). Universal strategies cannot take this individualistic stance (and indeed it is not their aim, nor is it of use for them to do so), meaning that supplementation with selective prevention for groups who may be particularly at risk or facing particular stressors, as well as targeted treatment as part of an approach which steps-up treatment intensity for those who need it is necessary to support a fully functioning support model at any given university.

1.4.2   Diagnosis specific and transdiagnostic intervention

Some child and adolescent mental health services have moved towards a more transdiagnostic approach in recent years, due to presentation of symptoms as well as practitioner caseloads preventing specialisations in therapies across multiple diagnoses, and a general mismatch between intervention development studies and the realities of busy services (Weisz, Krumholz, Santucci, Thomassin, & Ng, 2015). For example, youth often present to services with multiple comorbidities, all of which are in need of treatment, which challenges current treatment guidelines (Weisz et al., 2015). Transdiagnostic approaches have also been shown to be as effective as focal

treatments in adults with anxiety (Pearl & Norton, 2017), though this may not be the case for all disorders. For example current approaches for Post-Traumatic Stress Disorder (PTSD) require the specific mechanism of the trauma to be targeted, which can be challenging within a broader transdiagnostic intervention (Marchette & Weisz, 2017). This transdiagnostic approach may though be particularly relevant to student populations, principally in response to the high percentage of students presenting with both anxiety and depression (Auerbach et al., 2019; Jenkins, Ducker, Gooding, James, & Rutter-Eley, 2021). There is at present limited research on the overall efficacy of transdiagnostic approaches compared to more focal interventions in the student population. This approach could also find favour with students through addressing the concerns that they have regarding interventions being inadequate in addressing their needs in totality (Brimblecombe et al., 2017; Gulliver et al., 2010; Rickwood et al., 2005) and may help to reduce attrition rates.

Additional integration of services across external (including NHS) and university services has also been proposed as a necessary component of mental health services for university students (Universities UK, 2018), as this might not only reduce the burden on university counselling services, but also provide improved pathways to support for students in need of referral (Broglia et al., 2022; Office for Students, 2022). Given the rising rates of medication prescription for mental health disorders in students (e.g. in one US sample, From 2007 to 2018–2019, the proportion of students using any psychiatric medications in the last 12 months increased significantly from 13.5% to 23.5%; Morris et al. (2021)), the required additional communication between primary care services and university mental health services should also be considered. This integration would result in a more dedicated university service which also has the support of the larger network of qualified specialists in the NHS which can provide support with clarifying pathways into effective care for more complex cases whom on-campus counselling support is often insufficient (Leach & Hall, 2011; Morris et al., 2019). This could work as a means of providing a stepped-care approach within university campuses, a clinically and cost-effective model of treatment provision in general adult populations with common mental disorders (Clark et al., 2018; National Institute for Health and Care Excellence, 2022). This could allow university services to focus staff training on the lower intensity support which may be sufficient for the majority of students (Cornish

et al., 2017). However, Cuijpers et al (2019) argue that with any stepped care model, care must be taken to ensure that students are not provided with an intervention unlikely to work in their specific care, since treatment failure can lead to reluctance to initiate additional treatment. This further gives weight to the argument for taking a person-centred and stepped care approach to treatment provision which is based on need for university students. Despite this, issues with an approach such as this could remain if students requiring higher-intensity treatments are referred to services outside of the university, as students have expressed concerns regarding confidentiality and over-sharing of information when services outside the university context are enlisted (Leach & Hall, 2011). Downs et al. (2018) likewise reason that staying well-informed of the multiple available external (outside of university-based services) and internal sources of treatment available for students in order to optimise their own treatment teams is a major challenge for universities.

1.5 Research in this thesis

The objective of this thesis is to provide a comprehensive consideration of how treatment provision can be developed to maximise effectiveness and acceptability of mental health support available in a university setting. To achieve this, the following (interrelated) research questions were explored:

1) What do we know of the effectiveness of psychological interventions for students, and how might what is known about the particular difficulties faced by students lead to the development or adaptation of interventions?
2) What is the experience of mental health problems and the process of help-seeking and psychological treatment for students in a university setting and how might this inform the further development or adaption of interventions?
3) How does social support and social functioning impact on the effectiveness of mental health treatment in students and can understanding of this inform adaption of interventions to facilitate recovery?

In answering such questions, it is hoped that new avenues for research into the best way to deliver university mental health care can be identified

1.6 Structure of the thesis

The five empirical chapters that follow address potential avenues for adaptation and re-organisation of student mental health services through a mixture of quantitative and qualitative research. Chapter 2 describes a systematic review and meta-analysis of psychological intervention and prevention trials conducted in student populations, with the goal of exploring whether adaptation of procedures or content according to student-specific factors may contribute to variation in efficacy.

Chapter 3 describes the self-reported mental health support used and acceptability of this support by students in a single-centre cross-sectional observational study, with examination of how this may vary according to whether students are international or home status. Chapter 4 further explores student experiences of mental health support and expectations of what mental health support at university should entail through a qualitative interview study which develops a hierarchy of themes to represent student experience.

Chapter 5 steps away from the campus setting and explores whether general mental health services are as effective in producing positive outcomes in students compared to employed adults who are the same age. This is achieved using a large dataset from Improving Access to Psychological Therapies (IAPT) services and examining the association between student status and outcomes such as reliable recovery to establish whether students are at particular risk of experiencing poor outcomes. Finally, Chapter 6 attempts to examine possible mechanisms of treatment effectiveness, drawing on theories of social support and transition through the use of growth mixture models to identify subgroups of students who experience different trajectories of change in social functioning over the course of treatment in IAPT services. The association of each sub-group with treatment outcomes is then explored to provide a preliminary examination of social functioning and support as potential facilitators in improving mental health treatment outcomes for students.

Chapter 7 draws together the findings from the empirical chapters through summarising the key conclusions and presenting potential adaptations for mental health services in university settings. The implications of the findings will be

considered in terms of policy, practice and future research, and limitations of this thesis will be acknowledged.

1.7   Role of the researcher in the thesis

Throughout this thesis, I have had differing roles within the research conducted. Chapters 2 and 4 describe research which I designed and implemented the study. Chapter 3 describes research conducted in collaboration with other PhD students and with input from other researchers, including regarding some survey measures. However, the individual research questions covered in this chapter, that is the questions used to explore help-seeking preferences, and the analyses were conducted by myself. Chapters 5 and 6 used a large dataset of patients who attended IAPT services which are part of the "North Central and East London IAPT Service Improvement and Research Network" (NCEL IAPT SIRN). The measures collected as part of this service are fixed as part of wider IAPT routine outcome monitoring protocols, and were collected prior to the start of this work, although the design and conduct of the analyses using this data were my own.

In addition, it is important to highlight how my role as a researcher may have influenced outcomes and conclusions of this work. As a student, and someone with pre-existing knowledge of mental health disorders, it is possible that prior beliefs influenced the questions I sought to address, as well as the eventual conclusions made. Consideration of such bias may be particularly important when conducting qualitative research such as in Chapter 4 given the realist approach taken, which does not seek to remove all potential biases arising from prior knowledge. However, such biases could also influence decisions and conclusions in quantitative research, for example placing more weight on particular variables within an analysis. Therefore, the work in this thesis and eventual conclusions should be taken within this context; that of a researcher with their own personal experiences to draw upon regarding how experiences of university students may shape their wellbeing.

Chapter 2: The Efficacy of Psychological Interventions for the Prevention and Treatment of Mental Health Disorders in University Students: a Systematic Review and Meta-analysis

Publications relating to this chapter

The work in this chapter can be found in following publication: Barnett, P., Arundell, L. L., Saunders, R., Matthews, H., & Pilling, S. (2021). The efficacy of psychological interventions for the prevention and treatment of mental health disorders in university students: a systematic review and meta-analysis. *Journal of Affective Disorders*, *280*, 381-406.

2.1 Introduction

In Chapter 1 the various reasons for the importance of effective mental health support of students at university were outlined. When considering the best way to provide such services, it is important to first understand what psychological interventions could provide optimum outcomes to support mental health in student populations. While pharmacological interventions can play a role in treating students experiencing depression or anxiety disorders, it is generally recommended that psychological interventions are provided first for both young people and adults (Murphy et al., 2021; National institute for Health and Care Excellence, 2019, 2022). This is in part influenced by patient preference, for example, a meta-analytic review found that adults are three times more likely to prefer psychological to pharmacological treatment (both treatment-seeking and non-treatment seeking samples), and studies with younger participants reported a more pronounced preference compared to studies with older participants (McHugh, Whitton, Peckham, Welge, & Otto, 2013). This suggests that a useful starting point in considering effective mental health support for students is to evaluate the efficacy of psychological and psychosocial interventions in student populations.

2.1.1 Universal, Selective, Indicated and Treatment Interventions

As discussed in Chapter 1, universal prevention interventions constitute an important first step in reducing rates of mental health disorders presenting during university. A number of systematic reviews have sought to establish the benefit of such prevention strategies in students (Conley et al., 2015; Rith-Najarian, Boustani, & Chorpita, 2019), typically finding small to moderate effects on symptoms and emotional distress. However, universal interventions typically have smaller effect sizes than more targeted approaches (Conley et al., 2016; Cook et al., 2019), and are therefore less likely to be of significant benefit for students with identified higher risk (selective prevention) or those with pre-existing disorders or sub-threshold symptoms (treatment and indicated interventions, respectively). The percentage of students who arrive with pre-existing mental health problems is high, with up to 80% of students presenting with a problem at university having already experienced such a disorder (Auerbach et al., 2016).

2.1.2 Student-specific adaptations

To ensure the effectiveness of psychological interventions for students, it has been argued that specific aspects of student lifestyle that differ from other adult populations, and which may limit the potential benefits of generic psychological treatments, should be considered (Gawrysiak, Nicholas, & Hopko, 2009; McIndoo, File, Preddy, Clark, & Hopko, 2016; Michael, Huelsman, Gerard, Gilligan, & Gustafson, 2006). Any such adaptations to existing treatment, for example to address concerns specific to students, or amend intervention delivery to suit student preference, should also consider the problems of uptake and retention in this population. To date few studies have fully addressed the issues of uptake and retention, developmental adaptation of intervention content or mode of delivery. Indeed, many feasibility studies of psychological interventions have been convenience samples (used due to ease of recruitment of participants rather than to specifically establish what works for students rather than other adults) and have not been focused on the specific needs of students within intervention design or conclusions drawn. Previous reviews have also mainly focused on anxiety disorders and depression (Conley, Shapiro, Kirsch, & Durlak, 2017; Cuijpers et al., 2016; Rith-Najarian et al., 2019) with less attention paid to other mental health disorders such

as PTSD (Read, Griffin, Wardell, & Ouimette, 2014) or eating disorders (Eisenberg, Nicklett, Roeder, & Kirz, 2011).

2.1.3 Chapter aims

Provision of effective mental health support for students is a multifaceted problem in which uptake, access, attrition, treatment content and delivery, and effectiveness should be considered. This chapter sought to conduct a systematic review and meta-analysis to expand on previous reviews and examine the efficacy of indicated and selective psychological interventions for university students, specifically considering the evidence for adaptations to psychological interventions that could contribute to improving student mental health.

2.2 Method

Systematic reviews of randomised controlled trials are the preferred method for establishing the benefits of interventions in healthcare, because they set out to systematically reduce the influence of chance and bias in results (Chandler et al., 2019). This systematic review was prospectively registered on PROSPERO (CRD42019124362) and adhered to PRISMA guidelines (Moher, Liberati, Tetzlaff, Altman, & Group, 2009) for the reporting and conduct of systematic reviews. The review followed the registered protocol with the exception of one deviation: alcohol/drug abuse interventions were included only when the student sample were also at risk of other common mental disorders, as the literature on alcohol/drug abuse interventions more generally has been extensively summarised (Appiah-Brempong, Okyere, Owusu-Addo, & Cross, 2014; Bridges & Sharma, 2015; Carey, Scott-Sheldon, Garey, Elliott, & Carey, 2016; Gulliver et al., 2015; Samson & Tanner-Smith, 2015).

2.2.1 Search strategy

The search strategy implemented a combination of keyword and subject heading searches across MEDLINE (January 1st 1946-November 1st 2018), PsycINFO (January 1st 1806-November 1st 2018), CENTRAL (All years- November 2nd 2018), EMBASE (January 1st 1974-November 2nd 2018) and ERIC (January 1st 1981-

November 20th 2018). This search was supplemented with an update search on the 22nd July 2019. The full search strategy is available in Appendix 2.1. The search strategy was accompanied by a reference search of relevant reviews, which retrieved an additional 10 studies.

2.2.2 Selection criteria

Published studies meeting the following criteria were included:

Participants

University students (age range 17-26) who have an established mental health disorder, meet criteria on a validated symptom measure, or are at risk of having a mental health disorder (subthreshold symptoms or belonging to a group considered to have a higher chance of incidence). The decision to exclude studies with populations of a higher mean age was taken due to an interest primarily in interventions which may support those experiencing the developmental challenge of moving environments during a time of heightened risk for developing a mental health disorder, and to ensure the results of trials were applicable to the majority of students (70% of students fall within this range, HESA (2021)) who are most likely to have a more homogenous context, for example mature students may be more likely to live off campus, have a family, or work part time (Van Der Heijde, Douwes, & Vonk, 2019), and may require more individualised consideration within psychological trial designs.

Intervention

Psychological interventions which aim to reduce symptoms of common mental disorders (anxiety disorders, depressive disorders, eating disorders, PTSD) and self-harm (including suicidal behaviour and thoughts).

Control

Consisting of another active intervention, an attentional control, treatment as usual (TAU), waitlist, or no intervention.

Outcomes

Symptom severity measured on a validated scale at a minimum of one time point post-treatment.

Study design

Randomised controlled trials (RCTs)

Non-English language studies, studies with less than ten participants in each arm, dissertations, conference abstracts and study protocols, universal prevention interventions (those not focused on at-risk groups) and interventions to reduce smoking, drug or alcohol consumption were excluded. Interventions to improve assertiveness or body image or stress levels were also excluded, unless this symptom was targeted as a direct means of treating a mental health problem. Exercise or sleep interventions, and interventions for specific phobias or test anxiety (covered in detail elsewhere (Huntley, 2019)) were also excluded.

In line with the Institute of Medicine Framework (Haggerty & Mrazek, 1994), indicated interventions were considered to be those that identify individuals with detectable signs or symptoms of a disorder and selective interventions as those that identify specific sub-populations whose risk of disorder is significantly higher than that of the average for the population of concern. For studies targeting eating disorders, a diagnosis or risk of developing the disorder was required to be obtained using an objective measure, so that body image concerns alone as a trial entry criterion were considered insufficient to warrant inclusion in the review.

All titles and abstracts identified were screened by the author who excluded studies that did not meet inclusion criteria. Full-text articles were subsequently reviewed. A second reviewer (a PhD student in the same department with systematic review experience) independently reviewed 10% of all references at each stage. Disagreement between reviewers was approximately 8%, and all disagreements and unclear cases were resolved through referral to and discussion with a senior reviewer (PhD supervisor).

2.2.3 Data Extraction

The author extracted the data using an Excel-based form and the second reviewer validated 10% for accuracy with a high level of agreement found. Data extracted included: demographic and clinical characteristics of the sample; programme type (selective or indicated); intervention content including category of intervention (attention training, cognitive and behavioural therapies, mindfulness/meditation, positive psychology, psychoeducation, social support, social skills training , relaxation, or other), mode of delivery, transdiagnostic or disorder focused intervention, group or individual format, duration and intensity; intervention provider (professional or paraprofessional); and methodological characteristics which informed the quality assessment. Primary outcomes (symptom severity measured on a validated scale), and any reported secondary outcomes (wellbeing/quality of life measured on a validated scale, academic outcomes, and attrition from trial at end of treatment) were also extracted and where more than one measure of symptom severity was provided, those measures rated by a clinician were favoured over self-rated scales. Due to the strong association between stress and wellbeing (Lee, Goldstein, & Dik, 2018), measures of stress were used as indicators of wellbeing.

Any reported adaptation of the intervention was also reported. Studies were coded into three categories: *convenience sample interventions* were those who did not aim to examine effects specific to students but instead used students as a convenient way of recruiting participants; *student-focused interventions* discussed the problem of the disorder in question within student populations in the abstract or introduction and explicitly aimed to examine the interventions efficacy in this population; *student adapted interventions* were also explicitly aimed at the student population but also adapted the delivery or content with the intention to address student-specific issues regarding efficacy or access to, engagement with or uptake of treatment.

Where insufficient data was reported, study authors were contacted for the required information. Two authors (Haddock, Weiler, Trump, & Henry, 2017; Stallman, Kavanagh, Arklay, & Bennett-Levy, 2016) were contacted with one author (Haddock et al., 2017) providing additional data to allow inclusion. The other paper was

excluded from outcome meta-analysis due to insufficient data, but remained in analyses of attrition, as sufficient data was reported for this.

2.2.4 Quality Assessment

The author assessed the methodological quality of included studies using the Cochrane Risk of Bias tool (Higgins et al., 2011). This was also validated by a second reviewer, with disagreements discussed and consensus reached. Selection, performance, detection, attrition, and reporting bias were considered to be of unclear, low or high risk for each study. Although each study is best contextualised with an understanding of the individual areas of bias it is at risk of (Higgins, 2006), for the purposes of analyses which considered study quality (see "Metaregressions" below) and narrative descriptions of mechanistic studies, we assigned a label of "low risk of bias" to studies which reported low risk of bias in both random allocation and attrition bias, and high risk of bias to studies which reported high or unclear risk of bias for either, or both of these domains, to aid interpretation.

2.2.5 Data analysis

Meta-analysis

Effect size statistics were calculated as the standard mean difference (SMD) using the metafor package in R (Viechtbauer, 2010). The positive bias in the standardized mean difference is automatically corrected for within this package, yielding Hedges g (Hedges, 1981). Hedges g pools variances and standardizes outcomes across studies which allows for comparison among disparate outcome measures. Measures of attrition used dichotomous data and were calculated as odds ratios (OR). Pooled effects were estimated using a random-effects model. This assumes that analysed studies represent a random sample of effect sizes, facilitating generalizability (Borenstein, Hedges, Higgins, & Rothstein, 2009), and was considered appropriate for examining studies from a range of countries with differing inclusion specifications. Heterogeneity in true effects was calculated using I^2. A value of 0% suggests that any differences between studies represent sampling error only, rather than variance in true effect sizes and values of 25%, 50%, or 75% tentatively signify low, moderate, or high proportions of true heterogeneity (out of the total variation seen in study

effect sizes), respectively (Higgins, Thompson, Deeks, & Altman, 2003). Data for each diagnostic group were grouped into selective or indicated interventions, which also included treatment interventions. Indicated and treatment interventions were combined because in most cases the population included looked to be similar: cut off scores for inclusion varied and tended to be comparable to indicated prevention cut offs, and indicated treatment symptom requirements did not always state an upper limit, meaning both sub and above threshold participants were included. Active (active intervention, attentional control, or treatment as usual (TAU)) and waitlist (waitlist or no intervention) controls were also analysed separately. Outcomes were grouped into categories according to the time point post-intervention that they were collected: End of treatment (EOT), 1-3 months, 4-6 months, 7-12 months, and 13-24 months follow-up. Analyses were conducted on any category with at least two interventions contributing data. Where studies did not report outcomes at EOT, but provided a follow-up of 1 month or less from EOT, this was taken as the EOT measure. P-values less than 0.05 were considered to be statistically significant and the conventional values of effect size for SMD (Cohen, 1962) were used to aid interpretation: an effect size of 0.2 signifies a small, 0.5 a moderate, and 0.8 a large effect. Where studies targeted co-existing disorders, measures of each were extracted and analysed within their respective categories.

Meta-regressions

Meta-regressions were conducted on the combined sample of all studies as a preliminary exploration of potential patterns in the data regarding adaptation. In Model 1, the association between adaptation and intervention outcomes was examined. Additional models explored whether adaptation was a significant predictor of treatment outcomes when controlling for diagnosis, control type and programme type (indicated or selective) (Model 2), followed by the further inclusion of other intervention variables (delivery format, transdiagnostic or disorder-specific intervention, individual or group format, number of sessions, treatment provider, study quality) as covariates (Model 3) and then the further inclusion of age and gender as covariates (Model 4). Supplementary analyses also considered whether the other variables included in the models were associated with efficacy. It was not

possible to examine student status (first year undergraduate, general undergraduate, postgraduate) of the sample, as it was poorly reported across studies.

Publication bias

Publication bias refers to the tendency for more statistically significant positive results to be published, and fewer statistically significant negative results to be published, as well as the fact that larger effect sizes are also more likely to be published than smaller effect sizes (Torgerson, 2006). It can have a significant impact on the findings of systematic reviews (Torgerson, 2006). Therefore, the effects for each outcome were assessed for the degree of publication bias by visual examination of the funnel plot (Light & Pillemer, 1984). In a funnel plot, the point estimate of each study included in the review is plotted against either the study sample size or standard error, meaning that studies with high precision (as a result of larger sample sizes) appear near the top of the plot. Where there are no studies plotted on one side of the lower parts of the plot, this indicates that studies demonstrating a particular effect may be missing, indicating publication bias (Light & Pillemer, 1984; Torgerson, 2006), or that the effect size of a meta-analysis may overestimate a treatment effect as a result of over-representation of smaller studies reporting less precise, positive results.

Analysis of Mechanistic trials

Intervention development, or mechanistic trials, defined as trials with the primary purpose of understanding the mechanisms underlying treatment effectiveness but without a primary or explicit aim of treating the identified problem were not included in the main meta-analyses, although studies of this type have been included in similar past reviews (Huang, Nigatu, Smail-Crevier, Zhang, & Wang, 2018). This was because these trials tended to reduce arms of the trial to single component elements of an intervention to examine relative effectiveness of such components. This is important in intervention development to test potentially efficacious additions to treatments and to better understand causal mechanisms (Marchionni & Reijula, 2019). However, these trials would be unlikely to show the full effects of a complete intervention and so could underestimate such effects. The efficacy of these studies should be considered as part of a wider consideration of the mechanisms that may

result in positive outcomes for students, however (Marchionni & Reijula, 2019). Mechanistic and intervention development trials were therefore narratively described separately (see section 2.3.9).

2.3 Results

The search returned 9097 studies from which 423 potentially relevant full-text articles were identified. The update search returned 621 studies from which an additional 28 full-text articles were identified. A further 10 studies were also included from searching the reference lists of relevant systematic reviews. After checking the full texts of all potentially relevant articles, 98 studies in total met inclusion criteria. The full search and screening process is depicted in Figure 2.1 along with reasons for exclusion of full-text articles.

```
┌─────────────────────────────┐
│ 9097 studies identified via │
│ search of PsychINFO (2261), │        ┌──────────────────────────┐
│ MEDLINE (2711), Embase      │───────▶│ 1847 duplicates removed  │
│ (842), CENTRAL (1905) and   │        └──────────────────────────┘
│ ERIC (1378)                 │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐        ┌──────────────────────────┐
│ 7250 studies identified for │───────▶│ 6827 studies excluded at │
│ screening                   │        │ title or abstract        │
└─────────────────────────────┘        └──────────────────────────┘
              │
              ▼
┌─────────────────────────────┐        ┌──────────────────────────┐
│ 423 full-text items screened│◀───────│ 13 studies identified via│
└─────────────────────────────┘        │ forwards and backwards   │
                                       │ citation searches        │
                                       └──────────────────────────┘
```

Update Search conducted
22nd July 2019
513 additional studies retrieved
485 studies excluded at title or abstract
21 studies excluded at full text screen
7 studies included
-Universal sample (K=5)
-Excluded disorder or risk factor or intervention type (K=1)
-Not student-specific sample (K=3)
-Non-random assignment/quasi-experimental (K=2)
-Sample size <10 per arm (K=2)
-non-relevant outcomes (K=3)
-Mean age outside of included range (K=3)
-Not an intervention study/induced symptoms (K=2)

345 studies excluded
-Universal sample (K=103)
-Excluded disorder or risk factor or intervention type (K=90)
-Not student-specific sample (K=35)
-Non-English transcript, unable to translate (K=17)
-Non-random assignment/quasi-experimental (K=19)
-Sample size <10 per arm (K=15)
-non-relevant outcomes (K=13)
-Unable to locate information or full text (K=10)
-Mean age outside of included range (K=9)
-Data included as part of dataset of another included paper (K=7)
-Not an intervention study/induced symptoms (K=9)
-Uses same data as another paper which is already excluded (K=4)
-No comparator (K=7)
-No non-medicated control (K=2)

91 studies included in review

98 studies included in updated review

14 studies excluded from statistical analyses
-Mechanistic/intervention development studies

76 studies included in main analysis
77 studies included in analysis of attrition (unable to acquire necessary data for other analyses in 1 study)
83 studies included in sensitivity-analysis

Figure 2.1: PRISMA diagram

2.3.1 Characteristics of included studies

Overall, 7158 participants were included in the base-case meta-analysis, with an additional 302 participants added in a sensitivity analysis which included studies of poor methodological quality (see section 2.3.3). An additional 857 participants participated in mechanistic/intervention development studies. Within all included studies, 112 interventions were compared to a control. Indicated prevention or treatment interventions made up 86 of the 98 studies: studies targeted anxiety disorders (number of studies (K) =24), depression (K=36), both anxiety disorders and depression (K=9), eating disorders (K=11), and PTSD (K=6). There were 12 selective interventions included: these targeted anxiety disorders (K=4), depression (K=1) and both anxiety disorders and depression (K=7). Studies targeting anxiety included those with a focus on social anxiety (K=14), panic disorder (K=1), Obsessive Compulsive Disorder (OCD; K=1), and generalized or non-specified anxiety (K=26). Studies were from a variety of countries, though most were conducted in the US (K=47). Within studies included in statistical analyses, the average number of sessions offered in the experimental arm was 7.88.

Full interventions (non-mechanistic) were predominantly cognitive and behavioural therapies (K=57). Other interventions were relaxation (K=6), social skills training (K=2), attention training (K=1), social support (K=3), mindfulness and meditation (K=10), psychoeducation (K=7), positive psychology (K=1), multimodal interventions (K=2) and other (poetry therapy, expressive writing, music therapy) (K=5). Mechanistic interventions also tended to use components of interventions generally considered to be part of cognitive and behavioural therapies (K=9) while others trained attention (K=5), provided psychoeducation (K=2) or provided other forms of components (K=2; emotional disclosure and homework related to positive psychology). The majority of full interventions were delivered face-to-face (K=66), while others were via computer (K=23) and reading materials (K=5). An individual format was used by 45 interventions, with 49 interventions using a group format. Twenty-eight interventions involved guided or unguided self-help. The majority of mechanistic studies were also conducted face-to-face (K=10), and 13 were provided individually (the last mechanistic study did not clearly describe the treatment format).

Study characteristics are reported in Table 2.1, and further characteristics and references of all studies are reported in Appendix 2.2.

Table 2.1: Study Characteristics

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Generalised anxiety, selective											
Bowler 2017 ≠	Attention bias modification	Attentional Control	Attention training	Self-help (guided)	8 sessions 4 weeks	Low	Individual, Computer	Convenience sample	Focused	Paraprofessional	N: 34 Symptom severity: *End of treatment:* -0.16 (-0.87, 0.54) Attrition: 2.18 (0.18, 25.77)
	Interpretation bias modification	Attentional Control	Attention training	Self-help (guided)	8 sessions 4 weeks	Low	Individual, Computer	Convenience sample	Focused	Paraprofessional	N: 38 Symptom severity: *End of treatment:* 0.23 (-0.46, 0.91) Attrition: 0.31 (0.01, 7.93)
Grassi 2009	Mobile narrative	No intervention	Relaxation	Self-help (guided)	2 sessions 2 days	Low	Individual, Computer	Convenience sample	Transdiagnostic	Paraprofessional	N: 120 Symptom severity: *End of treatment:* 0.71 (0.18, 1.23)
Kanji 2006	Autogenic training	Active-Laughter therapy	Relaxation		60 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Student focused	Focused	Paraprofessional	N: 93 Symptom severity: *End of treatment:*1.00 (0.47, 1.52) *3 Months:*0.36 (-0.14, 0.86) *6 Months:*0.70 (0.18, 1.21) *12 Months:* 0.48 (-0.03, 0.98) Attrition: 2.10 (0.66, 6.65)
Noormohamadi 2019	Rational emotive behaviour therapy	Waitlist	Cognitive and behavioural therapies		9 sessions 9 weeks	Low	Individual, Face to face	Convenience sample	Focused	NR	N: 30 Symptom severity: *End of treatment:* 3.15 (2.05, 4.25) Attrition: 0.51 (0.01, 27.69)
Generalised/non-specific anxiety, indicated											
Call 2014	Yoga	No intervention	Mindfulness/ meditation		45 minute sessions 3 sessions 3 weeks	Low	Group, Face to face	Student focused	Transdiagnostic	NR	N: 47 Symptom severity: *End of treatment:*0.57 (0.07, 1.08) Wellbeing: *End of treatment:* 0.26 (-0.24, 0.75) Attrition: 3.67 (1.10, 12.27)

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Daley 1983	Small group anxiety management training	Waitlist	Relaxation		60 minute sessions 7 sessions 7 weeks	Low	Group, Face to face	Convenience sample	Focused	Paraprofessional	N: 45 Symptom severity: *End of treatment:* 1.00 (0.38, 1.63) *2 Months:* 0.66 (0.06, 1.27) Academic Outcomes: *2 Months:*-0.25 (-0.84, 0.34)
Delgado 2010	Mindfulness	Active-Relaxation	Mindfulness/ meditation		60 minute sessions 10 sessions 5 weeks	Low	Group, Face to face	Convenience sample	Transdiagnostic	NR	N: 32 Symptom severity: *End of treatment:* 0.05 (-0.64, 0.75)
Hutchings 1980	Anxiety management training	Attentional control	Relaxation		75 minute sessions 6 sessions 6 weeks	Low	Group, Face to face	Convenience sample	Focused	Paraprofessional	N: 24 Symptom severity: *End of treatment:* 0.44 (-0.31, 1.19) Attrition: 1.00 (0.01, 53.89)
Kenardy 2003	Online anxiety prevention	Waitlist	Cognitive and behavioural therapies	Self help (unguided)	5 sessions 1 week	Low	Individual, Computer	Convenience sample	Focused	Paraprofessional	N: 74 Symptom severity: *End of treatment:* 0.30 (-0.16, 0.76) *6 Months:* 0.35 (-0.27, 0.96) Attrition: 3.08 (0.58, 16.26)
LaFreniere 2016	Worry outcome journal	Attentional control	Cognitive and behavioural therapies	Self-help (guided)	10 sessions 1 week	Low	Individual, Journal	Convenience sample	Focused	Paraprofessional	N: 51 Symptom severity: *End of treatment:*0.19 (-0.36, 0.75) Attrition: 2.29 (0.09, 58.86)
Rezvan 2008	Cognitive Behavioural Therapy	No intervention	Cognitive and behavioural therapies		90 minute sessions 8 sessions 8 weeks	High	Group, Face to face	Convenience sample	Transdiagnostic	Professional	N: Symptom severity: *End of treatment:*2.93 (1.56, 4.30) *12 Months:*2.43 (1.17, 3.69) Wellbeing: *End of treatment:* 2.62 (1.32, 3.92) *12 Months:* 2.32 (1.08, 3.56) Attrition: 1.00 (0.02, 54.47)

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
	Cognitive Behavioural Therapy + interpersonal psychotherapy	No intervention	Multimodal		90 minute sessions 8 sessions 8 weeks	High	Group, Face to face	Convenience sample	Transdiagnostic	Professional	N: *Symptom severity:* *End of treatment:* 2.76 (1.43, 4.09) *12 Months:* 3.52 (2.01, 5.03) Wellbeing: *End of treatment:* 2.22 (1.00, 3.44) *12 Months:* 3.30 (1.84, 4.75) Attrition: 1.00 (0.02, 54.47)
Richards 2016	Calming anxiety i-CBT	Waitlist	Cognitive and behavioural therapies	Self help (guided)	6 sessions 6 weeks	Low	Individual, Computer	Student focused	Focused	Paraprofessional	N: 137 Symptom severity: *End of treatment:*0.32 (-0.01, 0.66) Attrition: 0.71 (0.29, 1.69)
Torabizadeh 2016	Muscle relaxation	No intervention	Relaxation		5 sessions 1 week	Low	Group, Face to face	Student focused	Transdiagnostic	Paraprofessional	N: 75 Symptom severity: *End of treatment:*1.49 (0.96, 2.03)
	Group counselling	No intervention	Social support		5 sessions 1 week	Low	Group, Face to face	Student focused	Transdiagnostic	Paraprofessional	N: 75 Symptom severity: *End of treatment:*0.81 (0.31, 1.30)

Social anxiety, indicated

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Akillas 1995	Symptom Prescription and Reframing	Waitlist	Cognitive and behavioural therapies		50 minute sessions 3 sessions 3 weeks	Low	Individual, Face to face	Convenience sample	Transdiagnostic	Paraprofessional	N: 27 Symptom severity: *End of treatment:* 1.23 (0.48, 1.99) *1 Month:* 1.32 (0.55, 2.08)
Beard 2008	Interpretation modification program	Attentional Control	Cognitive and behavioural therapies	Self-help (guided)	8 sessions 4 weeks	Low	Individual, Computer	Convenience sample	Focused	Paraprofessional	N: 27 Symptom severity: *End of treatment:* 0.84 (0.05, 1.63) Attrition: 1.07 (0.02, 58.03)
Bjornsson 2011	Group Cognitive Behavioural Therapy	Active-group psychotherapy	Cognitive and behavioural therapies		120 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Convenience sample	Focused	Professional	N: 41 Symptom severity: *End of treatment:*-0.54 (-1.17, 0.09) Attrition: 6.47 (0.69, 60.68)
Lee 2013	Imagery Rescripting and Cognitive Restructuring	Attentional Control	Cognitive and behavioural therapies		120 minute sessions 3 sessions 3 weeks	High	Individual, Face to face	Convenience sample	Transdiagnostic	Paraprofessional	N: 22 Symptom severity: *End of treatment:* 0.99 (0.10, 1.87) Attrition: 0.78 (0.01, 42.55)

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Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
McCall 2018	Overcome social anxiety	Waitlist	Cognitive and behavioural therapies	Self help (guided)	7 sessions	Low	Individual, Computer	Student focused	Focused	Paraprofessional	N: 101 Symptom Severity: *End of treatment:* 0.84 (0.33, 1.34) Attrition: 1.63 (0.72, 3.72)
Norton 2016 ≠	Imagery rescripting	Attentional Control	Cognitive and behavioural therapies		45 minute sessions 3 sessions 3 weeks	Low	Individual, Face to face	Convenience sample	Transdiag nostic	NR	N: 30 Symptom severity: *End of treatment:* 0.36 (-0.41, 1.12)
	Cognitive restructuring	Attentional Control	Cognitive and behavioural therapies		45 minute sessions 3 sessions 3 weeks	Low	Individual, Face to face	Convenience sample	Transdiag nostic	NR	N: 30 Symptom severity: *End of treatment:* 0.47 (-0.30, 1.23)
Roushani 2016	Unified transdiagnostic intervention	No intervention	Cognitive and behavioural therapies		90 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Convenience sample	Transdiag nostic	Professional	N: 29 Symptom severity: *End of treatment:* 0.81 (0.05, 1.57) Attrition: 2.14 (017, 26.33)
Schelver 1983	Self-administered cognitive therapy	Attentional Control	Cognitive and behavioural therapies	Self help (unguided)	NR	Low	Individual, Reading material	Convenience sample	Transdiag nostic	Paraprofessional	N: 23 Symptom severity: *End of treatment:* 1.02 (0.15, 1.89) Attrition: 1.45 (0.26, 8.01)
Stefan 2018	Mindfulness based stress reduction intervention	Waitlist	Mindfulness/ meditation		6 sessions 6 weeks	Low	Group, Face to face	Student focused	Transdiag nostic	Professional	N: 71 Symptom severity: *End of treatment:* 0.92 (0.32, 1.53) Attrition: 1.39 (0.52, 3.70)
Vestre 1989	Therapist administered rational emotive therapy	No intervention	Cognitive and behavioural therapies		60 minute sessions 5 sessions 5 weeks	Low	Group, Face to face	Convenience sample	Transdiag nostic	Professional	N: 27 Symptom severity: *End of treatment:* 0.76 (-0.05, 1.57) Attrition: 3.35 (0.32, 35.37)
	Self-administered rational emotive therapy	No intervention	Cognitive and behavioural therapies	Self help (unguided)	5 weeks	Low	Individual, Reading material	Convenience sample	Transdiag nostic	Paraprofessional	N: 29 Symptom severity: *End of treatment:* 0.10 (-0.66, 0.87) Attrition: 1.00 (0.06, 17.18)
Yao 2015 ≠	Attention bias modification	Attentional Control	Attention training	Self-help (guided)	1 session	Low	Individual, Computer	Convenience sample	Focused	Paraprofessional	N: 46 Symptom severity: End of treatment: -0.04 (-0.62, 0.54) Attrition: (0.02, 52.54)

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Ye 2017	Mindfulness based stress reduction	Treatment as usual	Mindfulness/ meditation		8 sessions 8 weeks	Low	Group, Face to face	Convenience sample	Transdiag nostic	NR	N: 27 Symptom severity: *End of treatment:* 0.72 (-0.06, 1.50) Attrition: 0.93 (0.02, 50.30)
Anxiety-OCD, indicated											
Timpano 2016 ≠	Anxiety Sensitivity Education and Reduction Training (ASERT) program	Attentional Control	Psychoeducation		50 minute session 1 session	Low	Individual, Face to face	Convenience sample	Transdiag nostic	Paraprofessional	N: 104 Symptom severity: *End of treatment:* 0.40 (0.01, 0.79) *1 Month:* 0.64 (0.25, 1.04) Attrition: 0.33 (0.01, 8.21)
Anxiety- Panic, indicated											
Gardenswartz 2001	Panic prevention workshop	Waitlist	Psychoeducation		300 minute session 1 session	Low	Group, Face to face	Convenience sample	Focused	Paraprofessional	N: 121 Symptom severity: *6 Months:* 0.33 (-0.03, 0.69) Attrition: 16.25 (2.02, 130.41)
Depression, selective											
Gortner 2006	Expressive writing	Attentional Control	Other: Expressive writing	Self Help (guided)	20 minute sessions 3 sessions 1 week	Low	Individual, Face to face	Convenience sample	Focused	Paraprofessional	N: 90 Symptom severity: *End of treatment:* -0.47 (-0.89, -0.04) *6 Months:* -0.08 (-0.50, 0.34) Attrition: 0.24 (0.01, 6.01)
Depression, indicated											
Armento 2012	Behavioural activation and religious behaviours	Active-supportive therapy	Cognitive and behavioural therapies		120 minute session 1 session 3 weeks	Low	Individual, Face to face	Student focused	Focused	Professional	N: 50 Symptom severity: *End of treatment:* 0.33 (-0.23, 0.89) *1 Month:* 0.34 (-0.23, 0.91) Wellbeing: *End of treatment:* 0.25 (-0.30, 0.81) *1 Month:* 0.47 (-0.10, 1.05) Attrition: (0.02, 52.37)

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Chen 2015	Music therapy	No intervention	Other: music therapy		40 minute sessions 20 sessions 10 weeks	Low	Group, Face to face	Convenience sample	Transdiagnostic	NR	N: 71 Symptom severity: *End of treatment*: 1.89 (1.32, 2.45) Attrition: 24.43 (1.37, 435.93)
Clore 2006 ≠	Negative self-thought restructuring	Active-enhancement of positive self-statements	Cognitive and behavioural therapies		60 minute sessions 3 sessions 3 weeks	High	Individual, Face to face	Convenience sample	Focused	Paraprofessional	N: 20 Symptom severity: *End of treatment*: 0.24 (-0.64, 1.12) Wellbeing: *End of treatment*: 0.45 (-0.44, 1.34) Attrition: 1.00 (0.22, 4.56)
Conoley 1985	Reframing	No intervention	Cognitive and behavioural therapies		30 minute sessions 2 sessions 1 week	Low	Group, Face to face	Convenience sample	Transdiagnostic	NR	N: 38 Symptom severity: *End of treatment*: 0.79 (0.13, 1.45) Wellbeing: *End of treatment*: 0.32 (-0.32, 0.96)
Cook 2019	Rumination-focused Cognitive Behavioural Therapy	Treatment as usual	Cognitive and behavioural therapies	Self-help (guided)	60 minute sessions 6 sessions 6 weeks	Low	Individual, Computer	Student adapted-delivery	Focused	Paraprofessional	N: 159 Symptom severity: *End of treatment: -0.02 (-0.29, 0.33) 3 Months*: 0.35 (0.03, 0.66) *12 Months*:0.07 (-0.25, 0.38) Attrition: 2.60 (1.06, 6.36)
Cui 2016	Group Cognitive Behavioural Therapy	Waitlist	Cognitive and behavioural therapies		8 sessions 8 weeks	Low	Group, Face to face	Student focused	Focused	Paraprofessional	N: 90 Symptom severity: *End of treatment:* 0.49 (0.05, 0.94) *6 Months:* 0.60 (0.15, 1.05) Attrition: 1.94 (0.61, 6.18)
	Support group	Waitlist	Social Support		8 sessions 8 weeks	Low	Group, Face to face	Student focused	Focused	Paraprofessional	N: 90 Symptom severity: *End of treatment:* 0.13 (-0.31, 0.57) *6 Months:* 0.55 (0.10, 1.00) Attrition: 1.69 (0.52, 5.51)
Gawrysiak 2009	Behavioural activation	No intervention	Cognitive and behavioural therapies		90 minute session 1 sessions 3 weeks	Low	Individual Face to face	Student focused	Transdiagnostic	Paraprofessional	N: 30 Symptom severity: *End of treatment:* 1.66 (0.83, 2.49)
Geisner 2006	Brief mailed intervention	Attentional Control	Psychoeducation	Self-help (guided)	1 session 4 weeks	Low	Individual, Computer	Student focused	Focused	NR	N: 177 Symptom severity: *End of treatment:* 0.07 (-0.22, 0.36)

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Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Geisner 2015	Brief mailed intervention	Attentional Control	Psychoeducation	Self-help (guided)	1 session 4 weeks	Low	Individual, Computer	Student adapted-content	Focused	NR	N: 169 Symptom severity: *End of treatment:* 0.15 (-0.15, 0.45) Attrition: 3.04 (0.12, 75.58)
Guo 2017	Positive psychotherapy	Attentional Control	Positive psychology		90 minute sessions 8 sessions 10 weeks	Low	Group, Face to face	Student focused	Transdiagnostic	Paraprofessional	N: 76 Symptom severity: *End of treatment:* 2.45 (1.86, 3.05) *3 Months:* 2.33 (1.74, 2.91) *6 Months:* 5.69 (4.68, 6.70) Attrition: 9.88 (1.18, 82.95)
Haddock 2017	Internal family systems therapy	Treatment as usual	Social skills training		50 minute sessions 16 sessions 16 weeks	High	Individual Face to face	Student focused	Focused	Professional	N: 37 Symptom severity: *End of treatment:* 0.42 (-0.24, 1.09) Attrition: 9.74 (0.50, 190.81)
Hamamci 2006	Psychodrama integrated with Cognitive Behaviour Therapy	No intervention	Cognitive and behavioural therapies		180 minute sessions 11 sessions 11 weeks	High	Group, Face to face	Convenience sample	Transdiagnostic	Professional	N: 16 Symptom severity: *End of treatment:* 1.44 (0.31, 2.57) *6 Months:* 0.67 (-0.37, 1.70)
	Group Cognitive Behavioural Therapy	No intervention	Cognitive and behavioural therapies		90 minute sessions 11 sessions 11 weeks	High	Group, Face to face	Convenience sample	Transdiagnostic	Professional	N: 16 Symptom severity: *End of treatment:* 1.42 (0.30, 2.55) *6 Months:* 0.49 (-0.53, 1.52)
Hamdan-Mansour 2009	Modified "Teaching Kids to Cope"	No intervention	Cognitive and behavioural therapies		45 minute sessions 10 sessions 10 weeks	Low	Group, Face to face	Student adapted-content	Transdiagnostic	Professional	N: 84 Symptom severity: *End of treatment:* 0.63 (0.19, 1.07) *3 Months:* 0.52 (0.09, 0.96) Attrition: 0.09 (0.00, 1.75)
Hinton 2010 ≠	Cognitive diffusion	Waitlist	Cognitive and behavioural therapies		60 minute sessions 3 sessions 3 weeks	Low	Individual Face to face	Convenience sample	Transdiagnostic	NR	N: 22 Symptom severity: *End of treatment:* 1.45 (0.50, 2.39) Wellbeing: *End of treatment:* 1.46 (0.51, 2.40) Attrition: 1.25 (0.14, 10.94)
Khumar 1993	Shavsana yoga	Waitlist	Relaxation	Self-help (guided)	30 minute sessions 30	Low	Individual, Face to face	Student focused	Transdiagnostic	Paraprofessional	N: 50 Symptom severity: *End of treatment:* 1.92 (1.25, 2.59)

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Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
					sessions 4 weeks						
Mastikhina 2017 ≠	Attention bias modification	No intervention	Attention training	Self-help (guided)	1 session	Low	Individual, Computer	Convenience sample	Focused	NR	N: 45 Symptom severity: *End of treatment:*-0.32 (-0.90, 0.27) Attrition: 0.86 0.86 (0.11, 6.73)
McIndoo 2016	Behavioural activation	Waitlist	Cognitive and behavioural therapies		60 minute sessions 4 sessions 4 weeks	Low	Individual Face to face	Student adapted-content	Transdiagnostic	Professional	N: 23 Symptom severity: *End of treatment:* 1.05 (0.11, 1.98) 1 *Month:* 0.97 (0.04, 1.90) Attrition: 0.87 (0.05, 15.28)
	Mindfulness	Waitlist	Mindfulness/ meditation		60 minute sessions 4 sessions 4 weeks	Low	Individual Face to face	Student adapted-content	Transdiagnostic	Professional	N: 27 Symptom severity: *End of treatment:* 0.69 (-0.19, 1.57) 1 *Month:* 0.40 (-0.47, 1.26) Attrition: 1.44 (0.12, 17.67)
McMakin 2011 ≠	Positive affect stimulation and sustainment	Attentional Control	Psychoeducation		20 minute sessions 3 sessions 2 weeks	Low	Individual, Face to face	Convenience sample	Transdiagnostic	Paraprofessional	N: 27 Symptom severity: *End of treatment:* 0.51 (-0.26, 1.27) Attrition: 3.48 (0.13, 93.31)
Mohammadian 2011	Poetry therapy	Waitlist	Other: Poetry therapy		90 minute sessions 7 sessions 7 weeks	Low	Group, Face to face	Convenience sample	Transdiagnostic	Professional	N: 28 Symptom severity: *End of treatment:* 1.30 (0.49, 2.12)
Mogoase 2013 ≠	Concreteness training	Waitlist	Cognitive and behavioural therapies		15 minute sessions 5 sessions 5 weeks	Low	Individual, Computer	Convenience sample	Focused	Paraprofessional	N: 41 Symptom severity: *End of treatment:* -0.16 (-0.77, 0.45) Attrition: 3.15 (0.12, 81.74)
Moldovan 2013	Bibliotherapy	No intervention	Cognitive and behavioural therapies	Self help (guided)	4 weeks	Low	Individual, Reading material	Convenience sample	Focused	Paraprofessional	N: 41 Symptom severity: *End of treatment:* 0.59 (-0.03, 1.22) *3 Months:* 0.38 (-0.28, 1.04) Attrition: 0.71 (0.14, 3.60)

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Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Pace 1993	Cognitive Behavioural Therapy	Waitlist	Cognitive and behavioural therapies		45 minute sessions 7 sessions 7 weeks	Low	Individual, Face to face	Convenience sample	Focused	Paraprofessional	N: 74 Symptom severity: *End of treatment:* 0.74 (0.26, 1.22) *1 Month:* 0.43 (-0.04, 0.89) Attrition: 1.39 (0.19, 10.39)
Peden 2000	Group Cognitive Behavioural Therapy	No intervention	Cognitive and behavioural therapies		6 weeks	Low	Group, Face to face	Convenience sample	Focused	NR	N: 92 Symptom severity: *End of treatment:* 0.79 (0.36, 1.21) *18 Months:* 0.67 (0.25, 1.09)
Phimarn 2015	Individual counselling	Active-group counselling	Psychoeducation		60 minute sessions 4 sessions 16 weeks	Low	Individual, Face to face	Student focused	Focused	Paraprofessional	N: 68 Symptom severity: *End of treatment:* 0.0.52 (0.04, 1.00) Wellbeing: *End of treatment:* 0.03 (-0.44, 0.51) Attrition: 1.00 (0.13, 78.54)
Robatmili 2015	Logotherapy	No intervention	Cognitive and behavioural therapies		60 minute sessions 10 sessions 10 weeks	Low	Group, Face to face	Student focused	Transdiagnostic	NR	N: 74 Symptom severity: *End of treatment:* 3.41 (2.04, 4.79) *1 Month:* 4.49 (2.85, 6.14) Wellbeing: *End of treatment:* 1.39 (0.41, 2.36) *1 Month:* 2.23 (1.11, 3.34)
Rohde 2014	Cognitive Behavioural Therapy	Attentional Control	Cognitive and behavioural therapies		60 minute sessions 6 sessions 6 weeks	Low	Group, Face to face	Student focused	Focused	Paraprofessional	N: 44 Symptom severity: *End of treatment:* -0.09 (-0.70, 0.52) *6 Months:* 0.03 (-0.58, 0.64) *12 Months:* -0.27 (-0.88, 0.34) Wellbeing: *End of treatment:* 0.22 (-0.38, 0.83) *6 Months:* 0.40 (-0.21, 1.02) *12 Months:* 0.38 (-0.24, 0.99) Attrition: 0.58 (0.10, 3.44)

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
	Bibliotherapy	Attentional Control	Cognitive and behavioural therapies	Self-help (guided)	6 weeks	Low	Individual, Reading material	Student focused	Focused	Paraprofessional	N: 39 Symptom severity: *End of treatment:* 0.12 (-0.51, 0.76) *6 Months:*-0.08 (-0.71, 0.55) *12 Months:* 0.06 (-0.57, 0.69) Wellbeing: *End of treatment:* 0.61 (-0.04, 1.26) *6 Months:* 0.33 (-0.30, 0.97) *12 Months:* 0.24 (-0.40, 0.87) Attrition: 0.35 (0.04, 3.32)
Rohde 2016	Cognitive Behavioural Therapy + cognitive dissonance	Attentional Control	Cognitive and behavioural therapies		60 minute sessions 6 sessions 6 weeks	Low	Group, Face to face	Student focused	Transdiagnostic	Professional	N: 59 Symptom severity: *End of treatment:* 0.61 (0.09, 1.13) *3 Months:* 0.12 (-0.39, 0.63) Attrition: 5.94 (0.27, 129.33)
Sadeghi 2016	Group Cognitive Behavioural Therapy	Attentional Control	Cognitive and behavioural therapies		12 sessions 9 weeks	Low	Group, Face to face	Convenience sample	Focused	NR	N: 30 Symptom severity: *End of treatment:* 1.37 (0.58, 2.17)
Saravanan 2017	Cognitive Behavioural Therapy	Attentional Control	Cognitive and behavioural therapies		60 minute sessions 7 sessions 8 weeks	Low	Individual, Face to face	Student adapted-delivery	Focused	Professional	N: 41 Symptom severity: *End of treatment:* 4.67 (3.49, 5.86) Attrition: 5.77 (0.26, 127.60)
Seligman 1999	Depression prevention workshop	No intervention	Cognitive and behavioural therapies		120 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Convenience sample	Transdiagnostic	Professional	N: 225 Symptom severity: *End of treatment:* 0.31 (0.04, 0.57) *6 Months:* 0.04 (-0.22, 0.30) *12 Months:* 0.08 (-0.18, 0.34) *18 Months:* 0.14 (-0.13, 0.41) Attrition: 1.12 (0.02, 57.05)
Seligman 2007	Depression prevention workshop	No intervention	Cognitive and behavioural therapies		120 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Convenience sample	Transdiagnostic	Professional	N: 227 Symptom severity: *End of treatment:* 0.65 (0.38, 0.92) *6 Months:* 0.63 (0.35, 0.90) Wellbeing: *End of treatment:* 0.25 (-0.01, 0.51) *6 Months:* 0.31 (0.04, 0.57) Attrition: 6.74 (1.46, 31.10)

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Vasquez 2012	Cognitive Behavioural Therapy	Active-relaxation	Cognitive and behavioural therapies		90 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Student focused	Focused	Paraprofessional	N: 133 Symptom severity: *End of treatment:* 0.54 (0.20, 0.89) *3Months:* 0.02 (-0.32, 0.36) *6 Months:* -0.11 (-0.45, 0.23) Attrition: 2.35 (0.44, 12.55)
Walker 2014 ≠	Cognitive Behavioural Therapy + Interpersonal Psychotherapy homework	Waitlist	Cognitive and behavioural therapies		2 weeks	Low	NR Face to face	Convenience sample	Transdiagnostic	NR	N: 32 Symptom severity: *End of treatment:* 0.79 (0.03, 1.54) Attrition: 2.10 (0.18, 24.87)
	Positive psychology homework	Waitlist	Positive psychology		2 weeks	Low	NR Face to face	Convenience sample	Transdiagnostic	NR	N: 32 Symptom severity: *End of treatment:* 0.51 (-0.23, 1.25) Attrition: 2.10 (0.18, 24.87)
Yang 2015	Attention bias modification	No intervention	Attention training	Self-help (guided)	8 sessions 2 weeks	Low	Individual, Computer	Convenience sample	Focused	Paraprofessional	N: 50 Symptom severity: *End of treatment:* 1.29 (0.68, 1.90) *3 Months:* 0.70 (0.13, 1.27) *7 Months:* 0.26 (-0.30, 0.82) Attrition: 0.85 (0.02, 44.76)
Yang 2018	Comprehensive self-control training	No intervention	Cognitive and behavioural therapies		90 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Convenience sample	Focused	Professional	N: 67 Symptom severity: *End of treatment:* 0.80 (0.30, 1.29) *4 Months:* 0.74 (0.24, 1.24) Attrition: 2.73 (0.50, 15.10)
Zemestani 2016	Metacognitive therapy	No intervention	Mindfulness/ meditation		90 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Convenience sample	Focused	Paraprofessional	N: 23 Symptom severity: *End of treatment:* 5.22 (3.48, 6.95) *3 Months:* 4.28 (2.77, 5.78) Attrition: 1.00 (0.06, 17.62)
	Behavioural activation	No intervention	Cognitive and behavioural therapies		90 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Convenience sample	Focused	Paraprofessional	N: 23 Symptom severity: *End of treatment:* 5.78 (3.90, 7.65) *3 Months:* 4.01 (2.57, 5.45) Attrition: 2.15 (0.17, 26.67)

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Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Anxiety and depression, selective											
Braithwaite 2009	Relationship-focused preventative intervention	Attentional control	Social skills training		7 sessions	Low	Individual, Computer	Convenience sample	Transdiagnostic	Paraprofessional	N: 77 Symptom Severity *End of treatment:* Anxiety: -0.24 (-0.69, 0.21) Depression:0.01 (-0.44, 0.45) *9 Months:* Anxiety: 0.16 (-0.29, 0.61) Depression: 0.21 (-0.24, 0.65) Attrition: 0.33 (0.08, 1.36)
Fitzpatrick 2017	"Woebot" online support	Attentional control	Cognitive and behavioural therapies	Self-help (guided)	14 sessions 2 weeks	Low	Individual, Computer	Student adapted-delivery	Transdiagnostic	Paraprofessional	N: 70 Symptom severity: *End of treatment:* Depression: 0.55 (0.08, 1.03) Anxiety: -0.13 (-0.60, 0.34) Attrition: 4.55 (1.14, 18.09)
Kang 2009	Mindfulness stress coping program	No intervention	Mindfulness/ meditation		120 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Student focused	Transdiagnostic	NR	N: 32 Symptom Severity: *End of treatment:* Anxiety: 0.49 (-0.21, 1.20) Depression: 0.69 (-0.03, 1.40) Wellbeing: *End of treatment:* 0.63 (-0.08, 1.34) Attrition: 0.73 (0.16, 3.45)
Levin 2017	Acceptance and Commitment Therapy	Waitlist	Cognitive and behavioural therapies	Self help (guided)	6 sessions 4 weeks	Low	Individual, Computer	Student adapted-delivery	Transdiagnostic	Paraprofessional	N: 62 Symptom severity: *End of treatment:* Depression: 0.07 (-0.43, 0.57) Anxiety: 0.15 (-0.35, 0.65) Wellbeing: *End of treatment:*-0.01 (-0.51, 0.49) Attrition: 0.83 (0.28, 2.44)

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)

Rasanen 2016	Acceptance and Commitment Therapy	Waitlist	Cognitive and behavioural therapies	Self help (guided)	15 sessions 5 weeks	Low	Individual, Computer	Student adapted-content	Transdiagnostic	Paraprofessional	N: 68
											Symptom severity:
											End of treatment:
											    Depression: 0.68 (0.19, 1.17)
											    Anxiety:-0.01 (-0.49, 0.47)
											Wellbeing:
											End of treatment: 0.22 (-0.26, 0.69)
											Attrition:
											10.83 (0.56, 209.49)

Song 2015	Mindfulness-based stress reduction	Waitlist	Mindfulness/ meditation		120 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Student focused	Transdiagnostic	Professional	N: 50 Symptom Severity: *End of treatment:* Anxiety: 0.50 (-0.10, 1.10) Depression: 0.70 (0.09, 1.31) Wellbeing: *End of treatment:*0.85 (0.23, 1.47) Attrition: 2.19 (0.36, 13.22)
Xu 2019	Wellbeing therapy	Attentional Control	Psychoeducation		120 minute sessions 5 sessions 5 weeks	Low	Group, Face to face	Student focused	Transdiagnostic	Professional	N: 101 Symptom severity: *End of treatment:* Depression: 0.60 (0.17, 1.04) Anxiety: 0.19 (-0.24, 0.61) *3 months:* Depression: 0.81 (0.37, 1.25) Anxiety: 0.45 (0.03, 0.88) Wellbeing: *End of treatment:*0.57 (0.14, 1.00) *3 Months:* 0.67 (0.23, 1.10) Attrition: 4.51 (1.18, 17.32)

Anxiety and depression, indicated

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)

Bentley 2018	Universal transdiagnostic intervention	No intervention	Cognitive and behavioural therapies		120 minute sessions 1 session 1 week	Low	Group, Face to face	Student adapted-delivery	Transdiagnostic	Professional	N: 138
											Symptom severity:
											 End of treatment:
											    Depression: 0.31 (-0.16, 0.78)
											    Anxiety: 0.19 (-0.28, 0.65)
											Wellbeing:
											End of treatment: 0.53 (0.06, 1.01)
											Attrition:
											0.89 (0.46, 1.73)

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Ellis 2011	Online Cognitive Behavioural Therapy	No intervention	Cognitive and behavioural therapies	Self help (unguided)	60 minute sessions 3 sessions 3 weeks	Low	Individual, Computer	Student focused	Transdiagnostic	Paraprofessional	N: 20 Symptom severity: *End of treatment:* Depression: 0.44 (-0.49, 1.37) Anxiety: 0.95 (-0.01, 1.92)
	Online peer support	No intervention	Social Support	Self help (unguided)	60 minute sessions 3 sessions 3 weeks	Low	Group, Computer	Student focused	Transdiagnostic	Paraprofessional	N: 20 Symptom severity: *End of treatment:* Depression: 0.62 (-0.32, 1.56) Anxiety: 0.90 (-0.06, 1.86)
Ezegbe 2019	Cognitive Behavioural Therapy	Waitlist	Cognitive and behavioural therapies		120 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Student focused	Focused	Paraprofessional	N: 55 Symptom severity: *End of treatment:* Depression: 4.08 (3.16, 5.01) Anxiety: 2.27 (1.59, 2.94) Attrition: 0.96 (0.02, 50.36)
Falsafi 2016	Yoga	No intervention	Mindfulness/ meditation		75 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Student focused	Transdiagnostic	Professional	N: 35 Symptom severity: *End of treatment:* Depression: 1.56 (0.77, 2.35) Anxiety: 0.68 (-0.04, 1.40) *3 Months:* Depression: 1.36 (0.59, 2.13) Anxiety: 0.75 (0.03, 1.47) Wellbeing: *End of treatment:* 0.70 (-0.02, 1.41) *3 Months:* 0.79 (0.07, 1.52) Attrition: *:* 1.00 (0.30, 3.31)

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)

	Mindfulness	No intervention	Mindfulness/ meditation		75 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Student focused	Transdiagnostic	Professional	N: 33
											Symptom severity:
											End of treatment:
											  Depression: 0.77 (0.04, 1.50)
											    Anxiety: 0.72 (-0.01, 1.45)
											  3 Months:
											  Depression: 1.24 (0.47, 2.01)
											    Anxiety: 0.90 (0.16, 1.64)
											Wellbeing:
											End of treatment: 0.55 (-0.17, 1.27)
											    3 Months: 0.77 (0.04, 1.50)
											Attrition:
											1.41 (0.45, 4.45)

Fawcett 2019	Individual counselling	Active-group counselling	Multimodal		60 minute sessions 6 sessions 6 weeks	High	Individual, Face to face	Student focused	Transdiagnostic	Professional	N:41 Symptom severity: *End of treatment:* Depression: 0.47 (-0.19, 1.13) Anxiety: 0.28 (-0.38, 0.93) Attrition: 0.09 (0.00, 1.95)

Sethi 2010	Face to face Cognitive Behavioural Therapy	No intervention	Cognitive and behavioural therapies		3 sessions 3 weeks	Low	Individual, Face to face	Student focused	Transdiagnostic	Professional	N: 20
											Symptom Severity
											End of treatment:
											  Depression: 1.94 (0.88, 3.01)
											    Anxiety: 1.58 (0.58, 2.59)

Stallman 2016[a]	Cognitive Behavioural Therapy	No intervention	Cognitive and behavioural therapies		6 sessions	Low	Individual, Face to face	Student focused	Transdiagnostic	Professional	N: 107 Attrition: 1.19 (0.50, 2.85)

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Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Uliaszek 2016	Dialectical Behaviour Therapy	Active-positive psychotherapy	Cognitive and behavioural therapies		120 minute sessions 12 sessions 12 weeks	High	Group, Face to face	Student focused	Transdiagnostic	NR	N: 54 Symptom severity: *End of treatment:* Depression: 0.23 (-0.31, 0.76) Anxiety: 0.03 (-0.51, 0.56) Wellbeing: *End of treatment:* 0.35 (-0.18, 0.89) Attrition: 0.21 (0.06, 0.72)
Wu 2002	Music therapy	No intervention	Other: Music therapy		120 minute sessions 10 sessions 10 weeks	Low	Group, Face to face	Student focused	Transdiagnostic	NR	N: 24 Symptom severity: *End of treatment:* Depression: 0.29 (-0.51, 1.10) Anxiety: 0.95 (0.11, 1.79) *2 Months:* Depression: 0.63 (-0.19, 1.45) Anxiety: 1.09 (0.23, 1.95) Wellbeing: *End of treatment:*-0.23 (-1.03, 0.57) *2 Months:*-0.14 (-0.94, 0.66) Attrition: 1.00 (0.12, 8.31)
Eating disorders, indicated											
Bucchianeri 2012 ≠	Self-affirmation	Attentional Control	Cognitive and behavioural therapies		1 session	Low	Individual, Face to face	Convenience sample	Focused	NR	N: 86 Symptom severity: *End of treatment:* -0.45 (-0.88, -0.02)
Coughlin 2006	Media literacy	Treatment as usual	Psychoeducation		90 minute sessions 2 sessions 4 weeks	Low	Group, Face to face	Student adapted-content	Focused	Paraprofessional	N: 35 Symptom severity: *End of treatment:* -0.20 (-0.87, 0.46) Attrition: 0.87 (0.42, 1.79)
Diaz-Ferrer 2017	Pure exposure	Active-guided exposure	Cognitive and behavioural therapies		45 minute sessions 6 sessions 3 weeks	Low	Individual, Face to face	Convenience sample	Focused	Professional	N: 35 Symptom severity: *End of treatment:* 0.07 (-0.60, 0.73) Attrition: 3.17 (0.12, 83.17)
Franko 2005	Food mood and sttitude prevention program	Attentional Control	Cognitive and behavioural therapies	Self help (guided)	60 minute sessions 2 sessions 2 weeks	Low	Individual, Face to face	Student adapted-delivery, content	Focused	Paraprofessional	N: 112 Symptom severity: *3 Months:* -0.07 (-0.73, 0.60) Attrition: 1.00 (0.14, 7.22)

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Kaminski 1996	Group intervention for bulimia	No intervention	Cognitive and behavioural therapies		90 minute sessions 8 sessions 8 weeks	Low	Group, Face to face	Student focused	Focused	Paraprofessional	N: 25 Symptom severity: *End of treatment:* 1.85 (0.92, 2.79) *3 Months:* 1.56 (0.66, 2.45) Wellbeing: *End of treatment:* 1.57 (0.68, 2.47) *3 Months:* 1.49 (0.60, 2.38) Attrition: 3.25 (0.30, 35.66)
Kass 2014	Student bodies with guided discussion	Active-student bodies without guided discussion	Cognitive and behavioural therapies	Self help (guided)	8 sessions 8 weeks	Low	Group, Computer	Student focused	Focused	Paraprofessional	N: 111 Symptom severity: *End of treatment:* 0.52 (0.19, 0.84) Attrition: 1.39 (0.67, 2.87)
Sanchez-Ortiz 2011	Internet Cognitive Behavioural Therapy	Waitlist	Cognitive and behavioural therapies	Self help (guided)	45 minute sessions 8 sessions 12 weeks	Low	Individual, Computer	Student focused	Focused	Professional	N: 76 Symptom severity: *End of treatment:* 1.22 (0.73, 1.71) Wellbeing: *End of treatment:* 0.89 (0.42, 1.36) Attrition: 0.51 (0.18, 1.43)
Taylor 2006	Internet student bodies	Waitlist	Cognitive and behavioural therapies	Self help (guided)	8 sessions 8 weeks	Low	Individual, Computer	Student focused	Focused	Professional	N: 29 Symptom severity: *End of treatment:* 0.57 (-0.21, 1.35) *12 Months:* 0.47 (-0.30, 1.25) Attrition: 1.89 (1.07, 3.33)
Taylor 2016	Image and Mood	Waitlist	Cognitive and behavioural therapies	Self help (guided)	10 sessions 10 weeks	Low	Individual, Computer	Student adapted-content	Focused	NR	N: 185 Symptom severity: *End of treatment:* 0.52 (0.23, 0.82) *12 Months:* 0.44 (0.15, 0.73) *24 Months:* 0.34 (0.05, 0.63) Attrition: 1.37 (0.63, 2.96)
Zabinski 2001	Student bodies	Waitlist	Cognitive and behavioural therapies	Self help (guided)	8 sessions 8 weeks	Low	Individual, Computer	Student focused	Focused	Paraprofessional	N: 56 Symptom severity: *End of treatment:*-0.20 (-0.72, 0.33) *2.5 Months:*-0.09 (0.61, 0.44) Attrition: 0.32 (0.01, 8.23)

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Zabinski 2004	Synchronous support group	Waitlist	Cognitive and behavioural therapies	Self help (guided)	60 minute sessions	Low	Group, Computer	Student focused	Focused	NR	N: 60 Symptom severity: *End of treatment:*0.24 (-0.26, 0.75) *2.5 Months:*0.36 (-0.15, 0.87) Wellbeing: *End of treatment*: 0.14 (-0.37, 0.65) *2.5 Months:*0.52 (0.00, 1.03) Attrition: 3.10 (0.12, 79.23)

PTSD, indicated

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Allan 2015	Anxiety Sensitivity Education and Reduction Training (ASERT) program	Attentional control	Psychoeducation		50 minute session 1 session	Low	Individual, Face to face	Convenience sample	Focused	Professional	N: 82 Symptom Severity: *End of treatment:* 0.36 (-0.07, 0.80)
Anderson 2010 ≠	Clinician assisted emotional disclosure	No intervention	Other: Emotion focused counselling		30 minute sessions 4 sessions 1.5 weeks	Low	Individual, Face to face	Student focused	Focused	Paraprofessional	N: 28 Symptom Severity: *End of treatment:* 0.26 (-0.48, 1.01)
Callinan 2015 ≠	Attention training	Attentional Control	Attention training		12 minute sessions 2 sessions	Low	Individual, Face to face	Convenience sample	Transdiagnostic	NR	N: 60 Symptom Severity: *End of treatment:* 0.68 (0.16, 1.20)
Lange 2001	Interapy	Waitlist	Cognitive and behavioural therapies		45 minute sessions 10 sessions 5 weeks	Low	Individual, Computer	Convenience sample	Focused	NR	N: 25 Symptom Severity: *End of treatment:* 0.92 (0.09, 1.74) Attrition: 0.62 (0.09, 4.34)
Littleton 2016	Surviver to Thriver online Cognitive Behavioural Therapy	Active-psychoeducational self-help	Cognitive and behavioural therapies		9 sessions 14 weeks	Low	Individual, Computer	Student focused	Focused	Paraprofessional	N: 87 Symptom Severity: *End of treatment:* -0.11 (-0.53, 0.31) *3 Months:* -0.18 (-0.60, 0.24) Attrition: 1.86 (0.76, 4.53)
Sloan 2011	Written emotional disclosure	Attentional control	Other: Expressive writing		20 minute sessions 3 sessions 1 week	Low	Individual, Face to face	Convenience sample	Focused	NR	N: 42 Symptom severity: *End of treatment:* -0.13 (-0.73, 0.48) Attrition: 1.50 (0.23, 9.92)

Suicidal thoughts, indicated

Study ID	Intervention	Comparison	Intervention Strategy	Self Help (guided/ unguided)	Length	Intensity (High/ Low)	Format, Delivery	Student adaption	Disorder adaption	Treatment provider	Study level effect size: Hedges' g/OR (95% CI)
Kovac 2002≠	Cognitive writing intervention	Attention Control	Cognitive and behavioural therapies		4 sessions	Low	Individual, Face to face	Student focused	Transdiagnostic	Paraprofessional	N:37 Symptom Severity: *End of treatment:* 0.10 (-0.59, 0.79) *1.5 months:* -0.23 (-0.92, 0.46) Attrition: 0.18 (0.02, 1.61)
	Exposure writing intervention	Attentional Control	Cognitive and behavioural therapies		4 sessions	Low	Individual, Face to face	Student focused	Transdiagnostic	Paraprofessional	N: 37 Symptom Severity: *End of treatment:* -0.12 (-0.81, 0.56) *1.5 Months:* -0.36 (-1.05, 0.33) Attrition: 0.78 (0.19, 3.14)

Note: Symptom Severity and Wellbeing data presented as Hedges' g, Attrition data presented as Odds Ratio (OR)
For studies with 2 interventions, and one control, N for the control group was halved.
[a]Authors contacted, no data available. Included in attrition analysis only.
≠ Mechanistic studies not included in main meta-analysis

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2.3.2 Risk of Bias and Study Quality

The quality of included studies was generally low and no studies were considered low risk of bias across all domains. Thirty-nine studies reported adequate random sequence generation, and 22 reported allocation concealment. Participant blinding was rarely achieved (K=7 reported some attempt to mask assigned study arm) though in psychological interventions this is very challenging. Most studies reported only self-report outcomes (K=86), which meant few studies reported adequate blinding of outcome assessment. Attrition bias was seen in 14 studies. Selective reporting was difficult to establish in most studies (K=89), since protocols were not published (See Figure 2.2).

Funnel plots were visually examined to explore publication bias in studies contributing to the meta-analysis (See Appendix 2.3) and demonstrated that small studies were unlikely to be contributing to biased estimates. However, heterogeneity across analyses ranged from low to high despite efforts to separate differential designs and populations.
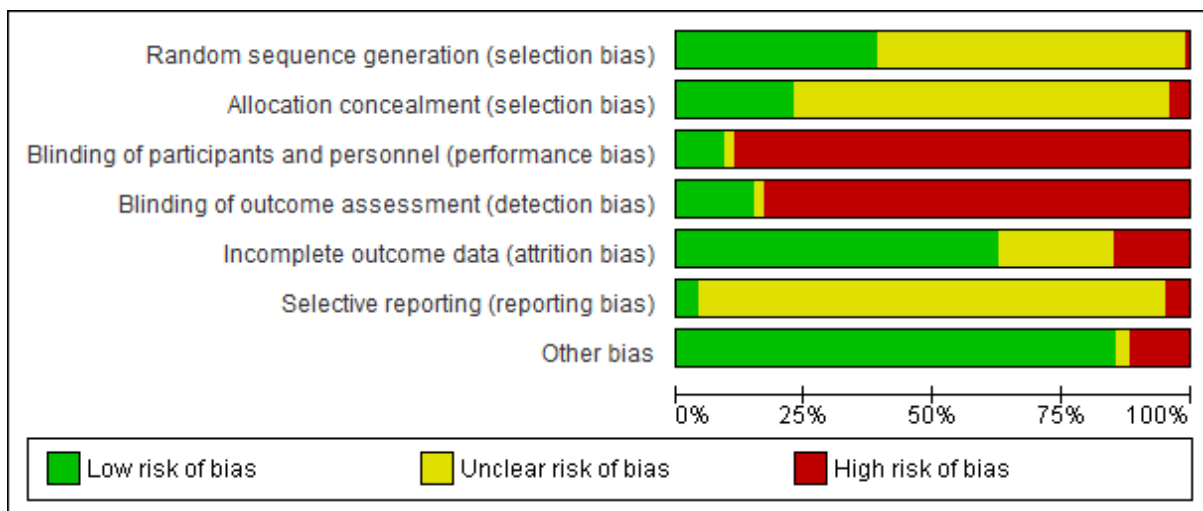
Figure 2.2: Risk of bias graph: judgements about each risk of bias item presented as percentages across all included studies

2.3.3 Sensitivity Analyses.

Seven studies (Ezegbe et al., 2019; Guo et al., 2017; Noormohamadi, Arefi, Afshaini, & Kakabaraee, 2019; Rezvan, Baghban, Bahrami, & Abedi, 2008; Robatmili et al., 2015; Saravanan, Alias, & Mohamad, 2017; Zemestani, Davoodi, Honarmand, Zargar, & Ottaviani, 2016) demonstrated extremely large effect sizes (Hedges' g >2). Upon further examination of their methods and discussion with the review team it was identified that changes in scores on symptom measures were extreme compared to other RCTs (e.g. reporting zero change in control arms, or reporting improvements in symptoms to levels above that of healthy populations) when compared to similar interventions, and so these studies were excluded from the main analysis. A sensitivity analysis was conducted in which these studies were retained. The addition of these studies increased effect sizes from medium to large in some analyses (Appendix 2.4).

2.3.4 Symptom Severity

Table 2.2 presents results of all meta-analyses of included studies for the efficacy of interventions in reducing symptom severity. Table 2.3 displays the results of sub-group analyses by intervention type

Table 2.2: Meta-analysis at all time-points

Disorder	Intervention Type	Control Type	Timepoint	K (Number of comparisons)	Hedges' g (95% CI)	p	I²
All	Indicated	Active	End of treatment	24 (27)	0.26 (0.13, 0.39)	<.001	37.7%
			1-3 month FU	6 (6)	0.16 (-0.01, 0.33)	.063	7.1%
			4-6 month FU	2 (3)	-0.08 (-0.34, 0.19)	.584	0%
			7-12 month FU	2 (3)	0.01 (-0.25, 0.26)	.961	0%
		Waitlist/no intervention	End of treatment	41 (54)	0.78 (0.65, 0.91)	<.001	56.3%
			1-3 month FU	13 (17)	0.64 (0.43, 0.84)	<.001	24.7%
			4-6 month FU	7 (9)	0.44 (0.25, 0.63)	<.001	39.7%
			7-12 month FU	4 (4)	0.27 (0.06, 0.47)	.012	15.8%
	Selective	Active	End of treatment	5 (8)	0.18 (-0.20, 0.56)	.350	70.6%
			1-3 month FU	2 (3)	0.15 (0.18, 0.84)	.002	0%
			4-6 month FU	2 (2)	0.29 (-0.47, 1.06)	.451	81.2%
			7-12 month FU	2 (3)	0.31 (-0.02, 0.64)	.069	0%
		Waitlist/no intervention	End of treatment	5 (9)	0.39 (0.14, 0.65)	.003	0%
Anxiety	Indicated	Active	End of Treatment	8 (8)	0.26 (-0.07, 0.58)	.124	47.0%
		Waitlist/No intervention	End of Treatment	17 (21)	0.73 (0.55, 0.90)	<.001	37.3%
			1-3 month FU	4 (5)	0.90 (0.58, 1.23)	<.001	0%
			4-6 month FU	2 (2)	0.33 (0.02, 0.64)	.037	0%
	Selective	Active	End of Treatment	4 (4)	0.19 (-0.32, 0.70)	.733	78.9%
		Waitlist/No intervention	End of Treatment	5 (5)	0.33 (0.06, 0.61)	.016	19.9%
Depression	Indicated	Active	End of Treatment	12 (13)	0.30 (0.14, 0.47)	<.001	38.2%
			1-3 month FU	4 (4)	0.20 (0.00, 0.40)	.046	0%
			4-6 month FU	2 (3)	-0.08 (-0.34, 0.19)	.584	0%
			7-12 month FU	2 (3)	0.01 (-0.24, 0.26)	.961	0%
		Waitlist/No intervention	End of Treatment	21 (26)	0.87 (0.67, 1.07)	<.001	66.5%
			1-3 month FU	7 (9)	0.66 (0.44, 0.87)	<.001	2.8%
			4-6 month FU	5 (7)	0.49 (0.24, 0.74)	.001	53.7%
			7-12 month FU	2 (2)	0.11 (-0.12, 0.35)	.348	0%
	Selective	Active	End of Treatment	4 (4)	0.17 (-0.33, 0.68)	.509	80.6%
		Waitlist/No intervention	End of Treatment	4 (4)	0.51 (0.18, 0.83)	.003	25.7%
Eating Disorders	Indicated	Active	End of Treatment	3 (3)	0.21 (-0.25, 0.66)	.378	54.2%
		Waitlist/No intervention	End of Treatment	6 (6)	0.64 (0.17, 1.11)	.008	79.1%
			1-3 month FU	3 (3)	0.53 (-0.26, 1.31)	.187	79.2%
			7-12 month FU	2 (2)	0.45 (0.17, 0.72)	.001	0%
PTSD	Indicated	Active	End of Treatment	3 (3)	0.06 (-0.26, 0.39)	.706	29.6%

Table 2.3: Intervention type subgroup analysis

Disorder	Intervention Type	Control Type	Intervention	K (Number of comparisons)	Hedges' g (95% CI)	p	I²
All	Indicated	Active	All interventions	24 (27)	0.26 (0.13, 0.39)	<.001	37.7%
			Cognitive and behavioural	14 (16)	0.28 (0.08, 0.48)	.005	55.0%
			Mindfulness/Meditation	2 (2)	0.36 (-0.29, 1.01)	.276	36.1%
			Psychoeducation	5 (5)	0.18 (-0.00, 0.37)	.050	9.7%
			Multimodal	1 (2)	0.37 (-0.09, 0.84)	.116	0%
		Waitlist/No intervention	All interventions	41 (54)	0.78 (0.65, 0.91)	<.001	56.3%
			Cognitive and behavioural	29 (34)	0.66 (0.53, 0.80)	<.001	45.6%
			Mindfulness/Meditation	4 (7)	0.77 (0.48, 1.06)	<.001	0%
			Relaxation	4 (4)	1.23 (0.66, 1.81)	<.001	69.2%
			Social Support	3 (4)	0.50 (0.08, 0.92)	.020	32.0%
			Other	3 (4)	1.22 (0.53, 1.91)	.001	58.9%
	Selective	Active	All interventions	5 (8)	0.18 (-0.20, 0.56)	.350	70.6%
			Cognitive and behavioural	1 (2)	0.20 (-0.46, 0.87)	.547	49.3%
			Psychoeducation	1 (2)	0.39 (-0.04, 0.81)	.073	0%
			Social skills training	1 (2)	-0.11 (-0.56, 0.33)	.614	0%
		Waitlist/no intervention	All interventions	5 (9)	0.39 (0.14, 0.65)	.003	0%
			Cognitive and behavioural	2 (4)	0.22 (-0.12, 0.56)	.208	0%
			Mindfulness/Meditation	2 (4)	0.58 (0.13, 1.04)	.012	0%
Anxiety	Indicated	Active	All Strategies	8 (8)	0.26 (-0.07, 0.58)	.124	47.0%
			Cognitive and behavioural	5 (5)	0.24 (-0.26, 0.73)	.345	64.4%
			Mindfulness/Meditation	2 (2)	0.36 (-0.29, 1.01)	.276	36.1%
		Waitlist/No intervention	All Strategies	17 (21)	0.73 (0.55, 0.90)	<.001	37.3%
			Cognitive and behavioural	10 (11)	0.62 (0.37, 0.87)	<.001	42.5%
			Relaxation	3 (3)	1.02 (0.44, 1.61)	.001	61.3%
			Social Support	2 (2)	0.83 (0.38, 1.27)	<.001	0%
			Mindfulness/Meditation	3 (4)	0.71 (0.40, 1.02)	<.001	0%
	Selective	Active	All Strategies	4 (4)	0.19 (-0.32, 0.70)	.733	78.9%
		Waitlist/No intervention	All Strategies	5 (5)	0.33 (0.06, 0.61)	.016	19.9%
			Cognitive and behavioural	2 (2)	0.07 (-0.28, 0.41)	.711	0%
			Mindfulness/Meditation	2 (2)	0.50 (0.04, 0.96)	.033	0%
Depression	Indicated	Active	All Strategies	12 (13)	0.30 (0.14, 0.47)	<.001	38.2%
			Cognitive and behavioural	7 (8)	0.35 (0.08, 0.61)	.010	54.1%
			Psychoeducation	3 (3)	0.19 (-0.03, 0.41)	.098	19.5%

				K (n)	Hedges' g (95% CI)	p	I²
		Waitlist/No intervention	All Strategies	21 (26)	0.87 (0.67, 1.07)	<.001	66.5%
			Cognitive and behavioural	15 (16)	0.71 (0.53, 0.88)	<.001	42.1%
			Social Support	2 (2)	0.22 (-0.18, 0.62)	.278	0%
			Mindfulness/Meditation	2 (3)	1.02 (0.47, 1.56)	<.001	28.5%
	Selective	Waitlist/No intervention	All strategies	4 (4)	0.51 (0.18, 0.83)	.003	25.7%
			Cognitive and behavioural	2 (2)	0.38 (-0.22, 0.98)	.213	65.8%
			Mindfulness/Meditation	2 (2)	0.70 (0.23, 1.16)	.003	0%
Eating Disorders	Indicated	Active	All Strategies	3 (3)	0.21 (-0.25, 0.66)	.378	54.2%
			Cognitive and behavioural	2 (2)	0.39 (-0.01, 0.79)	.057	30.6%
		Waitlist/No intervention	All Strategies	6 (6)	0.64 (0.17, 1.11)	.008	79.1%

K: number of studies. CI: Confidence interval. PTSD: Post-traumatic stress disorder.

Anxiety disorders.

Indicated interventions

Indicated interventions with active controls included cognitive and behavioural (K=5), mindfulness/meditation (K=2) and multimodal (K=1, individual counselling) interventions. Indicated interventions for anxiety had no significant effect on symptom severity reduction at EOT (K=8, Hedges' g= 0.26, 95% CI: -0.07, 0.58, p= .124) compared to active controls, and a medium effect (K=21, Hedges' g= 0.73, 95% CI: 0.55, 0.90, p<.001) compared to waitlist/no intervention controls. Sufficient data for follow-up analysis was available only for waitlist/no intervention comparisons. Effects improved at 1-3 months (K=5, Hedges' g= 0.90, 95% CI: 0.58,1.23, p<.001), and a small effect was found at 4-6 months (K=2, Hedges' g= 0.33, 95% CI: 0.02,0.64, p= .037), though the latter analysis had only two interventions. Sub-group analyses found that no individual intervention produced significant improvements in symptoms. Figure 2.3 shows effect sizes for indicated interventions for anxiety disorders at EOT with active controls.

Author	Interventions for anxiety disorders: Active comparisons	Hedges' g [95% CI]

Cognitive and behavioural therapies

Bjornsson 2011	-0.54 [-1.17, 0.09]
Uliaszek 2016	0.03 [-0.51, 0.56]
LaFreniere 2016	0.19 [-0.36, 0.75]
Beard 2008	0.84 [0.05, 1.63]
Lee 2013	0.99 [0.10, 1.87]
RE Model for Cognitive and behavioural therapies (I^2 = 64.35%)	0.24 [-0.26, 0.73]

Mindfulness/Meditation

Delgado 2010	0.05 [-0.64, 0.75]
Ye 2017	0.72 [-0.06, 1.50]
RE Model for Mindfulness/Meditation strategies (I^2 = 36.14%)	0.36 [-0.29, 1.01]

Multimodal

|	
Fawcett 2019	0.28 [-0.38, 0.93]
RE Model (I^2 = 47.0%)	0.26 [-0.07, 0.58]

-2 -1.5 -1 -0.5 0 0.5 1 1.5 2

Hedges' g

Figure 2.3: Forest plot of all indicated interventions for anxiety: active comparisons

Indicated interventions with waitlist/no intervention controls had cognitive and behavioural (K=11), relaxation (K=3), social support (K=2), mindfulness/meditation (K=4) and other interventions (music therapy, K=1). Relaxation (Hedges' g= 1.02, 95% CI: 0.44,1.61, p= .001) and social support (Hedges' g= 0.83, 95% CI: 0.38,1.27, p<.001) showed large effects on symptom severity while cognitive and behavioural (Hedges' g= 0.62, 95% CI: 0.37,0.87, p<.001) and mindfulness/meditation interventions (Hedges' g= 0.71, 95% CI: 0.40, 1.02, p<.001) showed medium effects (Table 2.3). Figure 2.4 displays the effect sizes at EOT for indicated interventions for anxiety with waitlist/no intervention controls/no intervention.

Author	Interventions for anxiety disorders: Waitlist/No intervention comparisons	Hedges' g [95% CI]

Cognitive and behavioural therapies
Vestre 1986.2 — 0.10 [-0.66, 0.87]
Bentley 2018 — 0.19 [-0.28, 0.65]
Kenardy 2003 — 0.30 [-0.16, 0.76]
Richards 2016 — 0.32 [-0.01, 0.66]
Vestre 1986.1 — 0.76 [-0.05, 1.57]
Roushani 2016 — 0.81 [0.05, 1.57]
McCall 2018 — 0.84 [0.33, 1.34]
Ellis 2011.1 — 0.95 [-0.01, 1.92]
Shelver 1983 — 1.02 [0.15, 1.89]
Akillas 1995 — 1.23 [0.48, 1.99]
Sethi 2010 — 1.58 [0.58, 2.59]
RE Model for Cognitive and behavioural therapies (I^2 = 42.50%) — 0.62 [0.37, 0.87]

Mindfulness/meditation
Call 2014 — 0.57 [0.07, 1.08]
Falsafi 2016.2 — 0.68 [-0.04, 1.40]
Falsafi 2016.1 — 0.72 [-0.01, 1.45]
Stefan 2018 — 0.92 [0.32, 1.53]
RE Model for Mindfulness/Meditation strategies (I^2 = 0.00%) — 0.71 [0.40, 1.02]

Other
Wu 2002 — 0.95 [0.11, 1.79]

Relaxation
Hutchings 1980 — 0.44 [-0.31, 1.19]
Daley 1983 — 1.00 [0.38, 1.63]
Torabizadeh 2016.1 — 1.49 [0.96, 2.03]
RE Model for Relaxation (I^2 = 61.28%) — 1.02 [0.44, 1.61]

Social support
Torabizadeh 2016.2 — 0.81 [0.31, 1.30]
Ellis 2011.2 — 0.90 [-0.06, 1.86]
RE Model for Social support (I^2 = 0.00%) — 0.83 [0.38, 1.27]

RE Model (I^2 = 37.3%) — 0.73 [0.55, 0.90]

-1 -0.5 0 0.5 1 1.5 2 2.5 3 3.5 4

Hedges' g

Figure 2.4: Forest plot of all indicated interventions for anxiety: waitlist/no intervention comparisons

Selective Interventions.

Selective interventions with active controls were cognitive and behavioural (K=1), psychoeducation (K=1), social skills training (K=1) and relaxation (K=1). Meta-analysis was not possible, the only intervention producing significant effects was the relaxation intervention (Hedges' g= 1.00, 95% CI: 0.47,1.52; Kanji, White, and Ernst (2006)). Interventions with waitlist/no intervention controls were cognitive and behavioural (K=2), mindfulness/meditation (K=2) and relaxation (K=1). Selective interventions did not show significant improvements compared to active controls (K=3, Hedges' g= -0.05, 95% CI: -0.31,0.21, p= .703) although they did show a small effect compared to waitlist/no intervention controls (K=5, Hedges' g= 0.33, 95% CI: 0.06,0.61, p= .016) (Table 2.2). When analysed separately at EOT,

mindfulness/meditation approaches had significant effects on symptom severity (K=2, Hedges' g= 0.50, 95% CI: 0.04,0.96, p= .033), although cognitive and behavioural approaches did not demonstrate significant treatment effects (K=2, Hedges' g=0.07, 95% CI: -0.28, 0.41, p=.033). The mobile narrative relaxation program also showed significant improvements in symptom severity (Grassi, Gaggioli, & Riva, 2009).

Depression.

Indicated interventions.

Interventions with active controls were cognitive and behavioural (K=8), psychoeducation (K=3), multimodal (K=1, individual counselling) and social skills training (K=1). Indicated interventions for depression had a small effect on symptom severity reduction at EOT (K=13, Hedges' g= 0.30, 95% CI: 0.14,0.47, p<.001) when compared to active controls, and a large effect (K=26, Hedges' g= 0.87, 95% CI: 0.67,1.07, p<.001) when compared to waitlist/no intervention. At follow-up, interventions showed a small effect at 1-3 months compared to active controls (K=4, Hedges' g= 0.2, 95% CI: 0.00,0.40, p= .046), and no significant effect at 4-6 months (K=3, Hedges' g= -0.08, 95% CI: -0.34,0.19, p= .584) or 7-12 months (K=3, Hedges' g= 0.01, 95% CI: -0.24,0.26, p= .961). Compared to waitlist/no intervention, a significant medium effect was retained at 1-3 months (K=9, Hedges' g= 0.66, 95% CI: 0.44,0.87, p<.001), and a small effect was found at 4-6 months (K= 7, Hedges' g= 0.49, 95%CI: 0.24,0.74, p<.001). There was no significant effect on symptom severity at 7-12 months (K=2, Hedges' g= 0.11, 95% CI: -0.12,0.35, p= .348). Sub-group analyses at EOT showed that only cognitive and behavioural therapies had a significant effect on symptom severity (Hedges' g= 0.35, 95% CI: 0.08,0.61, p= .010). Figure 2.5 shows the effect sizes for interventions for depression at end of treatment with active controls.

Author	Interventions for depression: Active comparisons	Hedges' g [95% CI]

Cognitive and behavioural therapies

Rohde 2014.1	-0.09 [-0.70, 0.52]
Cook 2019	0.02 [-0.29, 0.33]
Rohde 2014.2	0.12 [-0.51, 0.76]
Uliaszek 2016	0.23 [-0.31, 0.76]
Armento 2012	0.33 [-0.23, 0.89]
Vasquez 2012	0.54 [0.20, 0.89]
Rohde 2016	0.61 [0.09, 1.13]
Sadeghi 2016	1.37 [0.58, 2.17]
RE Model for Cognitive and behavioural therapies (I^2 = 54.08%)	0.35 [0.08, 0.61]

Multimodal

Fawcett 2019	0.47 [-0.19, 1.13]

Psychoeducation

Geisner 2006	0.07 [-0.22, 0.36]
Geisner 2015	0.15 [-0.15, 0.45]
Phimarn 2015	0.52 [0.04, 1.00]
RE Model for Psychoeducation (I^2 = 19.52%)	0.19 [-0.03, 0.41]

Social skills training

Haddock 2017	0.42 [-0.24, 1.09]
RE Model (I^2 = 38.2%)	0.30 [0.14, 0.47]

Hedges' g scale: -1, -0.5, 0, 0.5, 1, 1.5, 2, 2.5, 3

Figure 2.5: Forest plot for all indicated interventions for depression: active comparisons

Studies with waitlist/no intervention controls were attention training (K=1), cognitive and behavioural (K=16), mindfulness/meditation (K=3), relaxation (K=1), social support (K=2) and other (K=2 music therapy, K=1 poetry therapy). Sub-group analyses showed that cognitive and behavioural therapies (K=16, Hedges' g= 0.71, 95% CI: 0.53,0.88, p<.001) and mindfulness/meditation (K=3, Hedges' g= 1.02, 95% CI: 0.47,1.56, p<.001) significantly improved symptoms of depression. Social support did not produce significant improvements (p= .278). Figure 2.6 shows the effect sizes for interventions for depression at EOT with waitlist/no intervention controls.

Author	Interventions for depression: Waitlist/No intervention comparisons	Hedges' g [95% CI]

Attention training
Yang 2015 — 1.29 [0.68, 1.90]

Cognitive and behavioural strategies
Seligman 1999 — 0.31 [0.04, 0.57]
Bentley 2018 — 0.31 [-0.16, 0.78]
Ellis 2011.1 — 0.44 [-0.49, 1.37]
Cui 2016.1 — 0.49 [0.05, 0.94]
Moldovan 2013 — 0.59 [-0.03, 1.22]
Hamdan-Mansour 2009 — 0.63 [0.19, 1.07]
Seligman 2007 — 0.65 [0.38, 0.92]
Pace 1993 — 0.74 [0.26, 1.22]
Peden 2000 — 0.79 [0.36, 1.21]
Conoley 1985 — 0.79 [0.13, 1.45]
Yang 2018 — 0.80 [0.30, 1.29]
McIndoo 2016.1 — 1.05 [0.11, 1.98]
Hamamci 2006.2 — 1.42 [0.30, 2.55]
Hamamci 2006.1 — 1.44 [0.31, 2.57]
Gawrysiak 2009 — 1.66 [0.83, 2.49]
Sethi 2010 — 1.94 [0.88, 3.01]
RE Model for Cognitive and behavioural therapies (I^2 = 42.08%) — 0.71 [0.53, 0.88]

Mindfulness/Meditation
McIndoo 2016.2 — 0.69 [-0.19, 1.57]
Falsafi 2016.1 — 0.77 [0.04, 1.50]
Falsafi 2016.2 — 1.56 [0.77, 2.35]
RE Model for Mindfulness/Meditation (I^2 = 28.49%) — 1.02 [0.47, 1.56]

Other
Wu 2002 — 0.29 [-0.51, 1.10]
Mohammadi 2011 — 1.30 [0.49, 2.12]
Chen 2015 — 1.89 [1.32, 2.45]
RE Model for Other therapies (I^2 = 80.27%) — 1.19 [0.25, 2.13]

Relaxation
Khumar 1993 — 1.92 [1.25, 2.59]

Social Support
Cui 2016.2 — 0.13 [-0.31, 0.57]
Ellis 2011.2 — 0.62 [-0.32, 1.56]
RE Model for Social support (I^2 = 0.00%) — 0.22 [-0.18, 0.62]

RE Model (I^2 = 66.5%) — 0.87 [0.67, 1.07]

-1 -0.5 0 0.5 1 1.5 2 2.5 3 3.5 4

Hedges' g

Figure 2.6: forest plot for all indicated interventions for depression: waitlist/no intervention comparisons

Selective Interventions.

Selective interventions with active controls were cognitive and behavioural (K=1), psychoeducation (K=1), social skills training (K=1) and other (expressive writing, K=1). Selective interventions did not show improvements when compared to active controls (K=4, Hedges' g= 0.17, 95% CI: -0.33,0.68, p= .509) but showed medium effects when compared to waitlist/no intervention (K=4, Hedges' g= 0.51, 95% CI: 0.18,0.83, p= .003). No subgroup analyses of intervention approach could be conducted, however, no intervention individually produced significant reductions in depressive symptoms. Interventions with waitlist/no intervention controls were cognitive and behavioural (K=2) and mindfulness/meditation (K=2). Mindfulness/meditation showed significant effects on symptom severity (Hedges' g= 0.70, 95% CI: 0.23,1.16, p= .003), although cognitive and behavioural therapies did not.

Eating disorders.

Indicated interventions for eating disorders had no significant effect on symptom severity reduction at end of treatment (K=3, Hedges' g= 0.21, 95% CI: -0.25,0.66, p= .378) compared to active controls. However, when compared to waitlist/no intervention, a medium effect (K=6, Hedges' g= 0.64, 95% CI: 0.17,1.11, p= .008) was demonstrated. At follow-up, waitlist/no intervention comparisons displayed no significant effect at 1-3 months (K=3, Hedges' g= 0.53, 95% CI: -0.26,1.31, p= .187), although had a small effect at 7-12 months (K=2, Hedges' g= 0.45, 95% CI: 0.17,0.72, p= .001). No selective interventions targeting eating disorders met our PICOs criteria for inclusion.

Interventions with active controls used cognitive and behavioural therapies (K=3) and psychoeducation (K=1). Cognitive and behavioural therapies did not produce significant improvements at end of treatment (Hedges' g= 0.39, 95% CI: -0.01,0.79, p= .057). All interventions with waitlist/no intervention comparisons were cognitive and behavioural.

PTSD.

Indicated interventions for PTSD had no significant effect on symptom severity reduction at end of treatment (K=3, Hedges' g= 0.06, 95% CI: -0.26,0.39, p= .706) compared to active controls. One study with waitlist control was included and found a significant large reduction in PTSD symptoms at end of treatment (Hedges' g= 0.92, 95% CI: 0.09,1.74). No follow-up data or selective interventions targeting PTSD were available.

Interventions for PTSD with active comparisons were cognitive and behavioural (K=1), psychoeducation (K=1) and other (expressive writing, K=1). The single waitlist comparison intervention used cognitive and behavioural techniques.

Self-harm and Suicidal ideation

No interventions for suicidal ideation or self-harm met criteria for inclusion in the analysis.

2.3.5 *Meta-regression: Adaptation*

Meta-regression models were run to examine the association of adaptation with efficacy of intervention, unadjusted and adjusted for disorder and intervention factors, as well as for age and gender. Table 2.4 shows the results of all four models.

Table 2.4: Meta-regression of adaptation

Model	K	Variable	Beta	95% CI	p-value
1	98	Adapted intervention	-0.3	-0.56, -0.04	.025*
2	98	Adapted intervention	-0.25	-0.51, -0.00	.046*
		Diagnosis			
		(Anxiety, Depression)	-0.03	-0.32, 0.25	.836
		(Depression)	0.05	-0.19, 0.30	.654
		(ED)	-0.11	-0.44, 0.23	.532
		(PTSD)	-0.21	-0.67, 0.24	.355
		Waitlist/No intervention	0.46	0.28, 0.65	<.001*
		Selective Intervention	-0.19	-0.49, 0.12	.224
3	98	Adapted intervention	-0.3	-0.63, 0.03	.079
		Diagnosis			
		(Anxiety, Depression)	-0.15	-0.56, 0.26	.474
		(Depression)	-0.06	-0.36, 0.23	.679
		(ED)	0.07	-0.33, 0.47	.739
		(PTSD)	-0.1	-0.69, 0.48	.727
		Waitlist/No intervention	0.33	0.10, 0.56	.005*
		Selective Intervention	-0.31	-0.67, 0.05	.092
		Delivered face-to-face	0.29	-0.03, 0.61	.078
		Transdiagnostic	0.42	0.12, 0.73	.007*
		Individual Format	0.15	-0.10, 0.40	.235
		Number of sessions	0.02	-0.00, 0.05	.106
		Treatment provider	-0.2	-0.47, 0.08	.163
		High study quality	0.09	-0.19, 0.37	.519
4	60	Adapted intervention	-0.28	-0.62, 0.06	.103
		Diagnosis			
		(Anxiety, Depression)	-0.13	-0.60, 0.33	.572
		(Depression)	0.2	-0.17, 0.57	.284
		(ED)	0.08	-0.42, 0.58	.749
		(PTSD)	0.02	-0.56, 0.59	.954
		Waitlist/No intervention	0.39	0.16, 0.61	.001*
		Selective Intervention	-0.52	-0.91, -0.13	.010*
		Delivered face-to-face	0.11	-0.26, 0.47	.570
		Transdiagnostic	0.67	0.29, 1.04	.001*
		Individual Format	0.09	-0.18, 0.36	.498
		Number of sessions	0.01	-0.03, 0.05	.715
		Treatment provider	-0.12	-0.46, 0.22	.490
		High study quality	0.09	-0.23, 0.40	.591
		Age	0.01	-0.08, 0.09	.902
		Gender	0	-0.00, 0.01	.422

Note. *=p<.05. Gender variable denotes percentage of white participants
[a] reference category for diagnosis=anxiety
K: number of studies. CI: confidence interval

In Model 1, studies with adapted interventions were significantly associated with less improvement in symptom severity (β= -0.3, 95% CI: -0.56, -0.04, p= .025) compared to studies with non-adapted interventions. This remained a significant predictor of less improvement when controlling for diagnosis, control type and programme type (β= -0.25, 95% CI: -0.51, -0.00, p= .046). In Model 3, when also controlling for intervention characteristics, adaptation retained a coefficient of similar magnitude to the other models but it was no longer significant (β= -0.3, 95% CI: -0.63, 0.03, p= .079). Studies which were transdiagnostic (β= 0.41, 95% CI: 0.12, 0.73, p= .007) were associated with more improvement at EOT. When also controlling for age and gender, adaptation continued to have no significant association with treatment outcome, while transdiagnostic interventions (β= 0.67, 95% CI: 0.29, 1.04, p= .001) remained a significant predictor of improvement. Selective interventions were also associated with significantly smaller effects compared to indicated interventions (β =-0.52, 95% CI: -0.91, -0.13, p= .010) in Model 4 only.

We also examined other potential predictors of intervention efficacy which are presented in full in Table 2.5. Controlling for disorder, control type and risk status of participants, interventions offering more sessions and transdiagnostic interventions were positively associated with improvement.

Table 2.5: Metaregression of additional predictors of intervention effectiveness

K	Variable	Unadjusted			Adjusted for disorder, control type, intervention type		
		Coefficient	95% CI	p-value	Coefficient	95% CI	p-value
80	Age	0.02	-0.04, 0.08	.534	0.05	-0.01. 0.10	.128
93	Gender (% female)	-0.00	-0.01, 0.00	.598	0	-0.00, 0.01	.731
41	Ethnicity (% White) *	0	-0.01, 0.01	.700	0.01	0.00, 0.01	.238
98	Transdiagnostic	0.28	0.10, 0.47	.003	0.35	0.12, 0.58	.003
98	Individual format	-0.19	-0.38, 0.00	.052	-0.06	-0.25, 0.12	.506
92	Number of sessions	0.03	0.01, 0.05	.005	0.03	0.01, 0.05	.004
77	Professional treatment provider	0.14	-0.09, 0.37	.240	0.08	-0.15, 0.32	.492
98	High study quality	0.19	-0.04, 0.43	.104	0.11	-0.11, 0.33	.320

K: number of studies CI: confidence interval
*: Ethnicity was not included in the stepwise multivariate regression (see Table 2.4) because there was a lot of missing data for this variable

2.3.6 Wellbeing Outcomes

Eighteen studies reported wellbeing outcomes (including stress, happiness, self-esteem, meaning in life, quality of life, and wellbeing otherwise undefined). Thirteen studies reported wellbeing outcomes for indicated interventions. Interventions with active controls demonstrated no significant improvement in wellbeing at end of treatment (K=5, Hedges' g= 0.25, 95% CI: -0.01, 0.51, p= .060). There was limited report of follow up wellbeing outcomes, and none remained significant. When analysed separately, cognitive and behavioural interventions (K=4, Hedges' g= 0.35, 95% 95% CI: 0.03, 0.66, p= .031) displayed small effects in improving student wellbeing. Interventions with waitlist/no intervention controls showed a small effect at end of treatment (K=10, Hedges' g= 0.45, 95% CI: 0.21, 0.70, p< .001). Subgroup analyses indicated that cognitive behavioural interventions (K= 6, Hedges' g= 0.53, 95% CI: 0.18, 0.88, p= .003) demonstrated significant medium effects on wellbeing, and mindfulness/meditation interventions (K=3, Hedges' g= 0.37, 95% CI: -0.03, 0.78, p= .073) showed no significant benefit. Four studies (5 interventions) reported 3 months follow up, which retained a medium significant effect on wellbeing outcomes (Hedges' g= 0.69, 95% CI: 0.24, 1.15, p= .003).

Five studies reported wellbeing outcomes for selective interventions. Meta-analysis of the four interventions with waitlist/no intervention controls demonstrated no

significant improvement in wellbeing at the end of treatment (K=4, g=0.33, 95% CI: -0.05, 0.72, p= .092). The fourth study (Xu, Wu, Yu, & Li, 2019) reported a significant medium effect compared to an attentional control (g=0.57, 95% CI: 0.14, 1.00). Table 2.6 shows outcomes results of analyses of wellbeing.

Table 2.6: All meta-analyses across all disorders for the effectiveness of interventions in improving measures of wellbeing at end of treatment

Control Type	Main Strategy	K (Number of interventions)	Hedges' g (95% CI)	p	I^2
Selective: Waitlist/no intervention	All Strategies	4 (4)	0.33 (-0.05, 0.72)	.092	0%
Indicated: Active	All Strategies	4 (5)	0.25 (-0.01, 0.51)	.060	0%
	Cognitive and behavioural	3 (4)	0.35 (0.03, 0.66)	.031	0%
Indicated: Waitlist/no intervention	All Strategies	9 (10)	0.45 (0.21, 0.70)	<.001	40.2%
	Cognitive and behavioural	6 (6)	0.53 (0.18, 0.88)	.003	62.1%
	Mindfulness/Meditation	2 (3)	0.37 (-0.03, 0.78)	.073	0%

K: number of studies.

2.3.7 Attrition

Attrition data was available for 66 interventions. Table 2.7 shows the overall OR of attrition in the treatment compared to the control arm.

Table 2.7: Meta-analyses of attrition

Disorder	Control Type	K	Intervention % attrition	Control % attrition	OR (95% CI)	p	I^2
All	Active	29	14.5%	12.2%	1.26 (0.85, 1.85)	.249	34.9%
	Waitlist/no intervention	37	15.5%	11.2%	1.40 (1.12, 1.74)	.003	0.4%
Anxiety	Active	6	13.7%	6.2%	2.23 (0.91, 5.50)	.080	0%
	Waitlist/no intervention	9	23.7%	15.4%	1.80 (01.08, 3.00)	.024	25.4%
Depression	Active	11	9.2%	3.9%	2.12 (1.19, 3.77)	.011	0.7%
	Waitlist/no intervention	12	8.0%	3.4%	1.89 (1.03, 3.46)	.039	3.5%
Anxiety and Depression	Active	6	16.1%	23%	0.53 (0.19, 1.53)	.243	72.0%
	Waitlist/no intervention	9	23.4%	22.2%	1.02 (0.66, 1.58)	.930	0%
ED	Active	4	19.6%	18.7%	1.09 (0.66, 1.80)	.729	0%
	Waitlist/no intervention	6	14.4%	10/9%	1.31 (0.81, 2.14)	.271	14.3%
PTSD	(All)	3	29.4%	21.5%	1.53 (0.73, 3.22)	.262	0%

K: number of studies CI: confidence interval PTSD: post-traumatic stress disorder

Participants were significantly more likely to drop out of the intervention rather than the waitlist/no intervention arm (15.5% intervention vs 11.2% control, K=37, OR=1.40, 95% CI: 1.12, 1.74, p= .003), but were not significantly more likely to drop out compared to active controls (14.5% intervention arm vs 12.2% control, K=29, OR=1.26, 95% CI: 0.85, 1.85, p= .249). Interventions for students with symptoms of depression were particularly prone to increased rates of drop-out (active: OR=2.12, 95% CI: 1.19, 3.77, p= .011, waitlist/no intervention: OR=1.89, 95% CI: 1.19, 3.77, p= .039).

Post-hoc meta-regression analyses showed that adapting interventions for students did not reach significance in ameliorating drop out. (additional meta-regression analyses are available in Appendix 2.5).

2.3.8 Academic Outcomes

One study (Daley, Bloom, Deffenbacher, & Stewart, 1983) reported the impact of interventions on academic outcomes. This study found no significant effect of small group anxiety management training on improving grade point average.

2.3.9 Mechanistic studies

Fourteen studies were determined to be mechanistic in nature. Thirteen of these studies chose to sample students for convenience, while one study (Kovac & Range, 2002) had a student focus but did not adapt the arms of their trial for students. Of the four studies using samples with symptoms of anxiety, there was one high risk of bias study (Bowler et al., 2017) aimed at improving generalized anxiety symptoms, two (one low risk of bias, (Norton & Abbott, 2016) and one high risk of bias, (Yao, Yu, Qian, & Li, 2015)) aimed at improving social anxiety disorder symptoms, and one low risk of bias study (Timpano, Raines, Shaw, Keough, & Schmidt, 2016) aimed at improving symptoms of OCD. Overall, attention bias modification (K=2, (Bowler et al., 2017; Yao et al., 2015)) and imagery re-scripting and cognitive restructuring (Norton & Abbott, 2016) did not have significant impacts compared to attentional controls. However, Timpano et al. (2016) found that anxiety sensitivity reduction training, involving psychoeducation and exposure to distressing sensations conducted over one 50-minute session reduced symptoms at both end of treatment and 1 month follow up compared to the attentional control.

Of the six studies conducting RCTs in depression, there was one low risk of bias (Clore & Gaynor, 2006) and two high risk of bias cognitive and behavioural interventions (Hinton & Gaynor, 2010; Mogoase, Brailean, & David, 2013), a low risk of bias psychoeducational intervention (McMakin, Siegle, & Shirk, 2011), a high risk of bias attention bias modification intervention (Mastikhina & Dobson, 2017) and one high risk of bias trial that explored the benefit of adding either a positive psychology homework or an interpersonal therapy homework addition to a cognitive and behavioural treatment (Walker & Lampropoulos, 2014). Clore and Gaynor (2006) compared negative self-thought restructuring and enhancement of positive self-statements to each other and reported that neither of these elements were significantly different in their effect on depressive symptoms. Of the remaining cognitive and behavioural interventions, Hinton and Gaynor (2010) reported that cognitive diffusion strategies were beneficial compared to waitlist groups and Mogoase et al. (2013) did not find that only training "concrete thinking" was more beneficial in reducing depressive symptoms compared to waitlist at end of treatment. Neither attention bias modification (Mastikhina & Dobson, 2017) nor

psychoeducational writing about positive experiences (McMakin et al., 2011) were beneficial in reducing depressive symptoms compared to controls. In the trial by Walker and Lampropoulos (2014), interpersonal psychotherapy homework (scheduling social activities with friends and family) resulted in lower depressive symptoms at end of treatment than the waitlist, but the positive psychology homework group did not show these differences.

One low risk of bias study (Bucchianeri & Corning, 2012) tested a single session self-affirmation intervention against an educational newsletter control for eating disorder symptoms in 86 body-dissatisfied students. There was no effect on eating disorder symptoms at end of treatment. Two studies, including a high risk (Anderson, Fende Guajardo, Luthra, & Edwards, 2010) and a low risk of bias study (Callinan, Johnson, & Wells, 2015) conducted RCTs to test emotion-focused counselling and attention training interventions for PTSD, respectively. Although Anderson et al. (2010) found that emotion focused counselling was not superior to control at reducing symptoms of PTSD in students with experience of sexual assault and high psychological distress, Callinan et al. (2015) reported a medium effect on PTSD symptom reduction at end of treatment following the attention bias modification intervention.

Finally, one high risk of bias study (Kovac & Range, 2002) tested cognitive writing and exposure writing (writing about difficult times in detail (exposure) or writing about difficult times with reinterpretation (cognitive)) against an attentional control for reducing suicidal thoughts in 121 students. This was conducted over four sessions and was student focused. There was no significant impact on suicidal thoughts for either the cognitive writing condition or the exposure writing condition. Additional information on study design, included populations and study level effect sizes are provided in Table 2.1 and Appendix 2.2a.

In summary, although evidence was of varying quality, short-term mechanism-targeted components such as attentional bias modification may be unlikely to be effective in the case of students experiencing symptoms of anxiety and depression (Bowler et al., 2017; Bucchianeri & Corning, 2012; Clore & Gaynor, 2006; Mastikhina & Dobson, 2017; McMakin et al., 2011; Mogoase et al., 2013; Norton & Abbott, 2016;

Yao et al., 2015), although evidence from one high-quality study suggests that it may be of use as part of interventions for PTSD (Callinan et al., 2015). Evidence also suggests that interventions which provide add-on additional support to more complete interventions, for example support in social participation (Walker & Lampropoulos, 2014), provision of psychoeducation alongside behavioural exposure interventions (Timpano et al., 2016) or some cognitive training interventions (Hinton & Gaynor, 2010) may show some benefit, although this was usually compared to waitlist or attentional controls, making it difficult to understand the specific impact of the add-on component.

2.3.10 Transdiagnostic studies

Due to metaregressions indicating that studies with a transdiagnostic aspect may result in improved outcomes for students, a post-hoc examination of this subset of studies (K=38) was conducted. These interventions consisted of both interventions provided to a mixed population with either depression or anxiety symptoms (or both) (K=15), and interventions provided with a focus on one mental health disorder, but with an intervention aim to facilitate improvement across a range of mental health disorders (K=23; e.g. improving reactions to stress). Seven self-help interventions were rooted in cognitive and behavioural strategies and had a stated aim to reduce dysfunctional thinking, while another two self-help interventions focused on teaching relaxation techniques. Therapist-administered interventions (K=29, 33 interventions), focused on removal of dysfunctional beliefs (K=11), improved relaxation skills (K=6) or improved ability to cope with stress (K=9) as a disorder non-specific treatment target, while two focused on reducing stimulus avoidance, two facilitated social skill development and two set up non-specific online support groups. Overall, no clear pattern emerged to suggest there was promise in any of these intervention targets and along with the high heterogeneity it precluded any concrete conclusions regarding future directions in transdiagnostic research. While studies discussed potential utility of intervention strategies for other mental health disorders, only two studies (Bentley et al., 2018; Roushani, Arshadi, Bassak Nejad, Mehrabizadeh Honarmand, & Fakhri, 2016) specifically acknowledged that their intervention was transdiagnostic.

2.4 Discussion

This review expands on previous research on the efficacy of psychological interventions for students with or at risk of developing common mental health disorders. We identified important benefits of psychological treatment for depression, anxiety disorders and eating disorders, with some evidence of effects sustained at follow-up. Compared to active controls (alternative interventions, TAU, or attentional controls) the impact of these interventions was reduced, with only depressive symptoms showing small improvements. There were a limited number of interventions for PTSD and only one intervention study on suicidal ideation. This is disappointing, since suicidal ideation and self-harm are becoming increasingly common in student populations (Heath, Toste, Nedecheva, & Charlebois, 2008; Horgan, Kelly, Goodwin, & Behan, 2018; Read et al., 2014). This also aligns with a wider picture with data on effective interventions for suicidal ideation and self-harm being limited across all young people (Hawton et al., 2015; Robinson, Hetrick, & Martin, 2011). Furthermore, as for students, it has been reported that the majority of the suicide and self-harm reduction interventions for children and adolescents were developed for adults with little age-specific adaptation (Hawton et al., 2015). Undertaking more studies of possible interventions targeted at both young people and students in these areas should be considered a research priority.

Selective prevention interventions focused on anxiety and depressive disorders. These showed some benefits against waitlist/no intervention, suggesting potential utility as an option for students (Ryan, Shochet, & Stallman, 2010), possibly as part of a stepped care approach, which appears to be an effective model for the delivery of psychological interventions in general adult populations with common mental health disorders (Clark et al., 2018), but has not been formally evaluated within university settings. Although this review did not consider the broader organisational context in which services are delivered, future research should explore the role of service and organisational changes in improving metal health outcomes for students.

Cognitive and behavioural approaches were the most commonly investigated interventions, and were efficacious across anxiety disorders, depression and eating disorders. Mindfulness and meditation interventions also showed efficacy in treating

symptoms of anxiety and depression in both selective and indicated interventions compared to waitlist/no intervention. In addition, some evidence was found that increasing the number of treatment sessions improved outcomes, again in line with findings in adult populations (Clark et al., 2018).

In the meta-regressions, adopting a transdiagnostic approach was associated with greater symptom improvements. It is noteworthy that transdiagnostic approaches to treatment provision, with 42 interventions, comprised the majority of the studies in this review. However, almost all of the interventions identified as targeting processes which may be common across disorders in this review cannot be considered as fully transdiagnostic approaches. According to Fusar-Poli (2019), transdiagnostic studies should be explicit in stating the specific diagnoses that the intervention applies to, report the definition of the transdiagnostic construct, appraise the effectiveness of the transdiagnostic approach across diagnoses or beyond diagnoses, demonstrate a benefit of the transdiagnostic approach compared to specific diagnostic approaches and demonstrate the generalizability of the transdiagnostic approach. In most cases, studies in this review did not explicitly claim to test a transdiagnostic intervention, but either examined an intervention with a non-specific symptom target in a mixed diagnosis group or suggested that the processes involved in the intervention may show benefits in reducing symptoms of other mental health problems. Similarly, Harvey, Murray, Chandler, and Soehner (2011) described a differentiation between studies targeting "descriptively transdiagnostic" constructs and studies which are "mechanistically transdiagnostic", defined as interventions targeting causal mechanisms for co-occurrence of processes in different disorders (Harvey et al., 2011; Sauer-Zavala et al., 2017). While the latter presents a useful understanding of what an intervention should target, descriptively transdiagnostic studies only highlight that a construct is a symptom of different disorders, and do not provide an explanation of how it may contribute to presentation and maintenance of symptoms. As the majority of studies within this review reflect descriptively transdiagnostic studies at best, while others were simply interventions which the authors suggested may be beneficial to others, it is difficult to unpick the finding of an association between such studies and improved outcomes, particularly in combination with poor reporting quality, a problem which has been outlined across much of the transdiagnostic literature (Fusar-Poli, 2019). Nevertheless, it is possible that studies

which support students in improving one aspect of their experience of mental health symptoms that they can utilise across other aspects of their life- for example the ability to notice dysfunctional beliefs or to cope with higher stress loads-have a greater impact on outcomes because such skills may feel more relevant to everyday life. Furthermore, "universally therapeutic" approaches (Sauer-Zavala et al., 2017) may lend themselves to the university environment, where undisclosed or subthreshold comorbid problems are common (Levin et al., 2014). They may also have other benefits as the training required to develop effective therapists may be reduced (Marchette & Weisz, 2017).

Attrition was not as high as in previous reports of university-based treatments (Swift & Greenberg, 2012; Xiao et al., 2017), but that may be a consequence of the additional support and follow up associated with clinical trials. However, it remains unclear whether the cause of high attrition in student populations lies in poorer motivation, fear of stigma of attending treatment, limited improvement or aspects of the experience of care. Therefore, research should continue to focus efforts on reducing attrition, perhaps with an emphasis on involving students in the design of interventions.

2.4.1 Adaptation

Only 14 of the 94 studies included in the review were specifically adapted for students. However, we found that adapted interventions did not produce superior outcomes (in most cases fairing worse than non-adapted interventions), or reduce attrition. While this seems counter-intuitive, it is possible that current intervention designs are not fully encompassing what students need from mental health interventions. Some interventions adapted their content to suit specific student experiences, for example a higher sociocultural pressure to be thin than other ages, increased co-morbid risky alcohol use, and different treatment delivery preferences (Coughlin & Kalodner, 2006; Franko et al., 2005; Geisner, Varvil-Weld, Mittmann, Mallett, & Turrisi, 2015; Hamdan-Mansour, Puskar, & Bandak, 2009; McIndoo et al., 2016; Räsänen, Lappalainen, Muotka, Tolvanen, & Lappalainen, 2016; Taylor et al., 2016). Of these, efficacy was most common in those basing adaptions on empirical evidence and offering more sessions (Hamdan-Mansour et al., 2009; Taylor et al.,

2016). Some studies altered delivery style (Bentley et al., 2018; Cook et al., 2019; Fitzpatrick, Darcy, & Vierhile, 2017; Franko et al., 2005; Levin, Haeger, Pierce, & Twohig, 2017), often making interventions shorter or web-based (Bentley et al., 2018; Franko et al., 2005; Levin et al., 2017).However, there was no suggestion of greater improvement in those that did reduce treatment length, and in fact interventions with more sessions were associated with better results in meta-regression analyses. Trials to explore mechanisms or develop interventions also tended to be limited in time and sessions provided, with less than 60 minutes of intervention provided in some instances (Mastikhina & Dobson, 2017; McMakin et al., 2011; Timpano et al., 2016). The fidelity of interventions was rarely considered, making it difficult to establish whether all aspects of adaptation were utilised and it was not possible to ascertain whether shortening intervention protocols resulted in removal of key contributing therapeutic elements. Individual studies that directly address student motivation may be better placed to prevent drop-out, leading in turn to greater benefits (Gulliver et al., 2010; Quinn et al., 2009).

2.4.2   Effective components of mechanistic/intervention development studies

While results were mixed and therefore difficult to interpret, the results of those studies testing components of interventions or mechanisms highlighted what appears not to work in reducing mental health symptoms in students: short-term interventions which may not have sufficient contextual background and support such as short-term attentional bias modification were not effective in almost all of the studies testing them. What did appear to be of more benefit were those interventions which provided additional support or contextual learning. This lends weight to the argument that in order to feel that all of their difficulties are being addressed, students may require mental health support to be more relatable to their current experiences, potentially with adaptation and additional support focused on these issues.

2.4.3   Limitations

The review is limited by its inclusion only of published data and English language studies, meaning that some important emerging data could have been ignored. Studies included in this review also presented a number of limitations. Many were

characterised by a high risk of bias, possibly reflecting the use of students as an easily accessible sample for preliminary studies. As such, the analyses took an exploratory approach, with inferences for our findings remaining tentative. Furthermore, studies did not stratify results by ethnicity and few stratified by gender, which prevents an understanding of the potential role of these variables on intervention efficacy. Since university is now attended by a large proportion of students of minoritized ethnicities, consideration of individual groups and their needs warrants further investigation, particularly given continuing disparities in attainment (Amos & Doku, 2019; Office for Students, 2018). It is also possible that specific groups of students are more likely to benefit from particular treatments, and future research should explore avenues for personalising treatment based on patient characteristics and the student environment. For example, although many studies required participants to not be taking concurrent medication, this was not reported in all studies, and this can significantly impact psychological intervention effectiveness (e.g. Breedvelt et al. (2021); Haslam et al. (2019)). The lack of explicit descriptions of the interventions also hindered a thorough exploration of intervention adaptation. This makes it difficult to explain results suggesting that some adaptation negatively impacted outcomes. Furthermore, only one study considered mental health problems alongside comorbid alcohol problems (Geisner et al., 2015) which is of concern given the increased alcohol and drug consumption reported in this population (Prosser et al., 2018). Finally, given the prevalence of self-harm and suicidal attempts (Taub & Thompson, 2013), the lack of available studies is this area is also a limitation.

2.4.4 Conclusions

This review demonstrated that outcomes for students offered indicated psychological intervention may well be as efficacious as interventions provided for adults, although the treatments are not being fully optimised for the student population. Selective prevention interventions also show some benefit in reducing sub-threshold symptoms of anxiety disorders and depression compared to waitlist or no intervention controls, suggesting potential for the development of a stepped care approach involving selective intervention as a preliminary approach. At present, the evidence is strongest for cognitive and behavioural therapies although research into

other therapeutic strategies is limited. Considerable uncertainty about the best way to provide interventions for students remains. Adaptation of interventions based on a better understanding of the mechanism underlying students' mental health problems, perhaps using transdiagnostic approaches and consideration of student-specific contexts (for example reported sources of stress) is a potentially promising avenue.

Chapter 3: Self-reported mental health needs and use of mental health support by students: a cross-sectional observation study

Collaboration involved in this chapter

This chapter uses data from a survey developed in collaboration with two other doctoral students and a working group of academics who fed into the design of the survey. The ethics application was conducted collaboratively. Specific questions used in this analysis were written independently, and the analysis of data relevant to this chapter was also conducted independently.

3.1 Introduction

In Chapter 2, the efficacy of a range of psychosocial interventions for student populations was established, alongside the recognition that interventions adapted for student populations are under-researched. Although adaptation of interventions for students is important, so too are the sources of support used when experiencing mental health problems, and the barriers experienced when accessing this support. Differences in the experience of and barriers to mental health support may be the result of variables such as ethnicity, cultural beliefs, gender or age (Sonik et al., 2020), as well as personal beliefs about the aetiology of symptoms experienced (Dunlop et al., 2012). As students attending university are becoming more diverse in terms of the nature of their problems, their socio-economic status and available familial support (Pedrelli et al., 2015), it is necessary to consider these factors to promote equality of access to mental health support for all (Auerbach et al., 2016; Brittian et al., 2013; Ibaraki & Hall, 2014).

3.1.1 Preference and psychological treatment outcomes

Providing individuals with their preferred treatment has been associated with improved mental health treatment outcomes (Delevry & Le, 2019), although there is inconsistencies in this finding as preference does not guarantee better outcomes in all scenarios (Swift & Callahan, 2009). Uptake may also be higher and attrition lower when individuals are matched to preferred treatments (Windle et al., 2020), and improvements in therapeutic alliance (the collaborative relationship between

therapist and patient) are also reported in these instances (Baier, Kline, & Feeny, 2020; Windle et al., 2020). Given the increased demand for mental health services by students (Thorley, 2017), it is imperative that all methods which might promote better treatment outcome and reduced attrition are considered, which may include preference.

3.1.2 Sources of mental health support

D'Avanzo et al. (2012) describe different sources of mental health support for students. These include formal and informal support, with informal support options including both 'close' informal support and 'broad' informal support. The types of mental health support relevant to each of these categorisations are described below.

Formal support options for students and potential barriers

For students experiencing mental health problems, university-based mental health services such as student wellbeing and counselling services provide a range of available formal support. However, despite multiple reports of such services experiencing increasing demand (Pedrelli et al., 2015; Thorley, 2017; Universities UK, 2020), there remains a large percentage of the student population who do not contact them, even when experiencing debilitating levels of distress or mental health symptomatology. This issue of access also extends outside of university services into primary and secondary mental health services, which also provide support to students (D'Avanzo et al., 2012). For example, Bruffaerts et al. (2019) suggested that only 36% of students with any lifetime mental disorder or suicidal behaviours received any treatment (university-based or external) within the last year. One potential issue is that both forms of 'formal' mental health support may be associated with stigma and a lack of trust in the strangers who provide the support (Ebert et al., 2019; Velasco, Santa Cruz, Billings, Jimenez, & Rowe, 2020), suggesting that a lack of resources is not the only barrier to supporting all students with mental health problems (Ebert et al., 2019).

Gaining an understanding of what barriers such students at university face when deciding whether to seek help from formal support options will help focus efforts to improve accessibility of services. However, the extent to which each barrier may

impact in any one individual university will likely vary with the nature of a student's need, their understanding of their problem, and the mental health support available.

Informal sources of support

Informal sources of support include those sources which give help and advice but are not health professionals. Studies suggest that students may be more likely to choose informal sources of support over mental health professionals (D'Avanzo et al., 2012; Nguyen, Serik, Vuong, & Ho, 2019). Information from and support provided by informal sources may positively contribute to mental wellbeing (Nguyen et al., 2019) and be experienced as a more accessible form of support by some students. As discussed further below, informal sources of support may include both close forms of support and broader forms of support, which in a university context may encompass support from academic staff.

Close informal sources

Parents, other family members, and friends can often be the first port of call for young people experiencing distress or other symptoms of mental health problems (Rickwood, Deane, & Wilson, 2007). Social support may directly protect mental health through improved social relationships and also act as a buffer when experiencing stressful events (Gariepy, Honkaniemi, & Quesnel-Vallee, 2016). Utilising social support can be particularly important for students who experience a rapid shift in their social circles when attending university. Studies have shown that a lack of social support may increase distress particularly in first year students, who must establish themselves within new social groups in order to re-form social support networks, alongside an increased academic workload (Conley et al., 2014). This may be further exacerbated in international students, whose family and friends may reside in a different country.

Broader informal sources

Other sources of informal support, such as the internet, or contact with academic (non-clinical) university staff members can also form preferred sources of support for some people (Horgan & Sweeney, 2010; McAllister et al., 2014). For example, many students decide to use the internet before considering other support options, as they

may be seen as less stigmatising (Horgan & Sweeney, 2010). The internet also supports access to a number of self-help resources, which students again may prefer to use, particularly when they believe that their symptoms may not warrant more intensive support (Ebert et al., 2019).

Academic staff also play a role in supporting student mental health, and it has been suggested that this is an important element of a "whole university approach" (Hughes & Byrom, 2019; Universities UK, 2020). Informal support from academic staff could supplement formal university services, for example by signposting students in need or facilitating the identification of students who need but are not seeking support (McAllister et al., 2014). It could also help address barriers to formal support (Hughes & Byrom 2019). However, concerns have been expressed about the impact of this expectation on academic staff (Hughes & Byrom 2019, McAllister et al., 2014), including the emotional impact of support provision alongside academic duties and issues with confidentiality.

3.1.3 Cross-cultural factors

With an increasing number of young people choosing to study abroad for their tertiary education (Minutillo, Cleary, Hills, & Visentin, 2020; Studying in UK, 2021), mental health support must account for the cultural differences and associated challenges faced by international students (E. Jung, Hecht, & Wadsworth, 2007; Minutillo et al., 2020). Alongside adapting to the demands of higher education, international students must also adjust to new cultural environments, and for many, in a 'new' language (G. Williams, Case, & Roberts, 2018). For some international students, informal sources of support such as parents may be less accessible due to time zone differences as well as distance, while aforementioned language barriers (G. Williams et al., 2018) or adjustment difficulties (Minutillo et al., 2020) may also make the formation of a new social support network more challenging. Furthermore, some evidence suggests that international students may be less likely to access formal treatment (Liu, Wong, Mitts, Li, & Cheng, 2020; Nilsson, Berkel, Flores, & Lucas, 2004) and be at a higher risk of dropping out of treatment (Nilsson et al., 2004). As such, an understanding of whether preferences among international students differ to those of students attending university in their home country may

help to develop a culturally inclusive approach to service delivery for universities (Minutillo et al., 2020).

3.1.4 Chapter aims

The primary aim of this chapter was to explore, within a single university, what proportion of students in need of mental health support accessed formal and informal support services while at university. A secondary aim was to describe differences in the utilised support between students attending university from non-UK countries and the UK. Preferences and barriers for particular support options were also explored.

3.2 Method

3.2.1 Study design and context

This study used data from a cross-sectional survey completed by university students attending University College London in October 2019 ("SENSE Survey," 2020), developed in collaboration with two other doctoral students and a working group of UCL academics who fed into the design of the survey. The survey was approved by the UCL research ethics committee (ref: 8227/002).

3.2.2 Participants

Participation in the survey was voluntary. Students participated if they responded to a link in an email sent to all students at the university in October 2019, and provided informed consent to participate and for the use of the data they provided. The survey was completed on Qualtrics software.

Survey respondents were included in the current analysis if they were aged between 17 and 25. Included participants were also required to have moderate levels of anxiety or depression symptom severity, or self-harm resulting in the need for medical attention in the past 12 months (see section 3.2.3 for symptom measure cut offs). Participants reporting symptoms of psychosis at least monthly which were rated as at least "a bit distressing" were also included. This meant that included participants encompassed students considered 'in need' of mental health support.

3.2.3 Measures

Demographic factors.

Alongside consent to participate, students were also asked to give their consent for data they provided upon registering at university ('registry data') to be linked with their survey responses. Alternatively, students could decline for this data to be linked to their survey response, and instead self-report their demographic data. Reported demographics in this chapter used registry data when consent was given, with gaps filled in by self-reported answers for those students who declined to have their data linked. Data linkage was conducted automatically using student ID number. After completion of the survey, data was anonymised with all identifiable information used to link information removed.

Age (calculated using date of birth and date of last survey activity), sex, gender identity, sexual orientation, ethnicity (according to Office for National Statistics recommended categories (Office for National Statistics)), religious beliefs, nationality, fee status (UK, European Union (EU), overseas), mode of study (full or part time/flexi), level of study (undergraduate, postgraduate taught, postgraduate research), current year of study (1-'6 or above'), learning location (campus or distance) and any current diagnoses of mental health disorders were additionally available characteristics.

Mental health symptoms.

Depression.

The Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, and Williams (2001)) was used to measure symptoms of depression. The PHQ-9 asks the participant to rate how often in the last two weeks they have been bothered by problems associated with depression, such as "feeling down, depressed or hopeless", or "feeling tired or having little energy". Scores for each of the nine items range from 0 ("not at all") to 3 ("nearly every day") resulting in a maximum possible score of 27. In line with recommended cut-offs, students with scores of ten or more on the PHQ-9 were considered as 'cases' of depression (Kroenke & Spitzer, 2002) .

Anxiety

The Generalized Anxiety Disorder Scale (GAD-7; Spitzer, Kroenke, Williams, and Löwe (2006)) was used to measure symptoms of anxiety. Similarly to the PHQ-9, the GAD-7 asks the participant to report how often in the last two weeks they have been bothered by problems associated with anxiety, such as "not being able to stop or control worrying", or "trouble relaxing". Scores also range from 0 ("not at all") to 3 ("nearly every day"), resulting in a maximum possible score of 21. In line with recommended cut-offs, students with scores of ten or more on the GAD-7 were considered as 'cases' of anxiety (Spitzer et al., 2006).

Psychosis and schizophrenia

The psychosis scale from the Composite International Diagnosis Interview (CIDI; Smeets and Dingemans (1993)) was used to measure symptoms of psychosis. Participants were asked if they had experienced a number of symptoms of psychosis: seeing something that was not really there or that others could not see, hearing things that others said did not exist, believing a strange force was trying to communicate with them, or believing an unjust plot was going on to harm them. Of those responding positively to one of these questions, students were asked how often these experiences had happened in the past year. Response options ranged from not at all to nearly every day or daily.

Self-harm and suicide attempts within the last 12 months

Participants were asked if they had deliberately hurt themselves in any way in the past 12 months, and if they had made a suicide attempt in the past 12 months. For both, response options were either yes or no.

Help-seeking

Participants were asked "Which of the following have you <u>ever</u> sought help from for mental health or an emotional problem <u>since you started university</u>? Please tick all that apply." Checking boxes for multiple support options was allowed. Options for response to this question included the following, alongside an "other (please specify)" option:

Informal support options

- Partner/significant other (e.g. boyfriend, girlfriend)
- Friend (not related to you)
- Parent/carer
- Other relative/ family member
- The internet/ other online support
- Religious leader

Informal university staff support options

- Personal tutor/academic mentor
- Other member of academic staff within university (e.g. lecturer)

Formal mental health support options

- Peer supporter or peer mentor
- General practitioner (GP) or doctor
- Mental health professional (psychiatrist or psychologist, councillor or social worker)
- Member of university support staff (e.g. student wellbeing advisor)
- Telephone-based support options (e.g. Nightline, Samaritans)

No support

- None of the above

Usefulness of sources of support

For any sources of support which they reported using, participants were asked to indicate how useful this source of support was. The five options for response to this question ranged from "not at all useful" to "extremely useful" and were associated with a numerical score ranging from 1 for not at all useful to five for extremely useful. Scores were averaged to provide an average usefulness rating for each source of support.

Barriers to use of university mental health support services

Participants were asked "if you have had an emotional or mental health problem, and have not used the university's support services, please indicate what the main barriers were." Multiple answers were allowed. Options for response to this question included the following, alongside an "other (please specify)" option:

- I have not had a problem
- Lack of time
- Lack of confidentiality
- Concern that no one will understand my problems
- I didn't know where to find help
- Stigma of mental health care
- Fear of unwanted intervention
- Fear of documentation on academic record
- Difficulty with access to care
- Lack of available services

3.2.4 Data analysis

Sources of mental health support used were summarised using number of participants and percentage of total sample. Ratings of usefulness provided only by those students reporting use of a support source were reported as the mean score. Students reporting any symptoms of psychosis (N=13) were included in the main group frequencies because they all also endorsed significantly raised levels of anxiety, depression or self-harm. Finally, the numbers of students endorsing a range of pre-specified barriers were reported as the number of students and the percentage of all students in the sample who endorsed the barrier. Other barriers reported using the "other" free text entry were also reported. Exploratory differences between international (Overseas and EU) and home resident students were conducted using Chi-square tests for count data, and adjusted residuals with Bonferroni-adjusted p-values (Auerbach et al., 2016; Beasley & Schumacker, 1995) reported for significant associations. The Kruskal-Wallace rank sum test (Kruskal & Wallis, 1952) was used for mean ratings.

3.3 Results

3.3.1 Survey completion

The survey was sent out to 43,836 students, of which 3272 (7.5%) started the survey. Of these, 2687 (82.1%) completed the full survey. After excluding participants who were outside the specified age range and who were not either above the threshold for anxiety or depression, or reporting self-harm, 1,128 respondents were included, of which 1076 had fully completed the required questions in the survey. The flow of participants is represented in Figure 3.1.
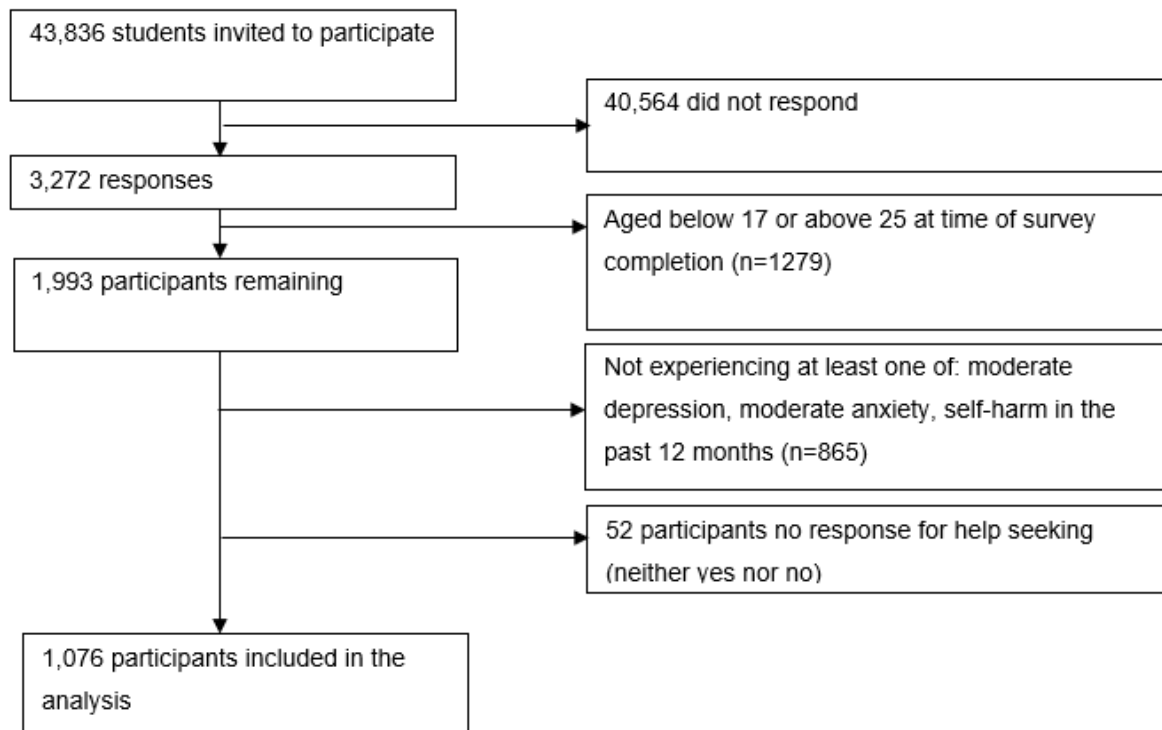
Figure 3.1: Flow diagram of participant inclusion

3.3.2 Participant Characteristics

Table 3.1 shows the characteristics of the survey respondents. Data from the university registry was linked for 846 students while 249 students declined to have their registry data linked. These students self-reported their demographic data. The sample was heavily weighted towards females (77%), and people from a white ethnic background (59.1%), although over 10% of the sample were Chinese. Compared to the total university population for 2019-2020, when the survey was

completed, this represents a slight overrepresentation of females (55% in the total university undergraduate population) and people from a white background (41% in the total university undergraduate population). The sample also underrepresented Chinese students despite the large relative percentage (25% in the total university undergraduate population). Most Asian and Arab ethnic groups were also underrepresented within the sample, as were Black African students, however there were similar proportions of Black Caribbean and mixed-race students within the sample compared to the total university population (although the proportion of these remained small). Thirteen students (1.2%) reported experiencing symptoms of psychosis. All of these also met the threshold for inclusion based on symptoms of anxiety or depression, or self-harm or suicidal ideation. Only 11.8% of the sample had no current official mental health disorder diagnosis, although of these 70% met the criteria for being a 'case' for depression on the PHQ-9, 61.4% met the criteria for being a 'case' for anxiety on the GAD-7 and 22.8% reported self-harm or suicide.

Table 3.1: Characteristics of participants

Item		Count	%
Sex	Male	241	22.4
	Female	829	77.0
	Other	1	0.1
	Missing	5	0.5
Gender identity	Matching sex assigned at birth	1025	95.3
	Not matching sex assigned at birth	12	1.1
	Missing	39	3.6
Sexual orientation	Bisexual	160	14.9
	Homosexual	47	4.4
	Heterosexual	672	62.5
	Other	27	2.5
	Missing	170	15.8
Ethnicity	White	636	59.1
	Black or Black British- Caribbean	5	0.5
	Black of Black British-African	18	1.7
	Asian or Asian British-Indian	54	5.0
	Asian or Asian British-Pakistani	23	2.1
	Asian or Asian British-Bangladeshi	18	1.7
	Chinese	125	11.6
	Other Asian background	50	4.6
	Mixed-White and Black Caribbean	10	0.9
	Mixed-White and Black African	8	0.7
	Mixed-White and Asian	4.3	4.0
	Other mixed background	28	2.6
	Arab	15	1.4
	Other ethnic background	25	2.3
	Missing	18	1.7
Religious beliefs	No religion	598	55.6
	Buddhist	16	1.5
	Christian	175	16.3

	Hindu	18	1.7
	Jewish	12	1.1
	Muslim	70	6.5
	Sikh	6	0.6
	Spiritual	36	3.3
	Any other religion or belief	20	1.9
	Missing	125	11.6
Fee Status	UK	583	54.2
	EU	251	23.3
	Overseas	242	22.5
Mode of study	Full-time	1052	97.8
	Part-time	24	2.2
Level of study	Undergraduate	746	69.3
	Postgraduate taught	242	22.5
	Postgraduate research	88	8.2
Year of study	1st	478	44.4
	2nd	264	24.5
	3rd	235	21.8
	4th	70	6.5
	5th	15	1.4
	6th	14	1.3
Learning location	Campus	1069	99.3
	Distance	7	0.7
Report of a MH disorder diagnosis at present	Attention Deficit Hyperactivity Disorder (ADHD)	26	2.4
	Autism or autism spectrum disorder	22	2.0
	Anxiety disorder (e.g. generalised anxiety disorder, social anxiety, panic attacks)	482	44.8
	Obsessive Compulsive Disorder (OCD)	57	5.3
	Post-traumatic Stress Disorder (PTSD)	29	2.7
	Depression	415	38.6
	Eating disorder (e.g. anorexia, bulimia)	95	8.8
	Bipolar disorder, schizophrenia or psychosis	11	1.0
	Personality disorder	20	1.9
	Other	29	2.7
	None	127	11.8
Age	Mean: 21.18, SD:1.96		

3.3.3 Sources of support used and rated usefulness

Number of sources utilised

Students reported the sources of support they had accessed for experiences of mental health problems while at university. In total, 939 (87.3%) students reported using at least one source of support, while the mean number of sources of support utilised was 2.8. Only 137 (12.7%) of students had not used any source of support. The number of sources of support used by students is summarised in Table 3.2.

Table 3.2: Number of sources of support used by students

Number of sources used	Number of students	%
0	137	12.7
1	194	18.0
2	218	20.3
3	183	17.0
4	121	11.2
5	85	7.9
6	62	5.8
7	37	3.4
8	23	2.1
9	10	0.9
10	6	0.6
Total	1076	100

Favoured sources of support

The popularity of each source of support, including the average rating of usefulness is presented in Table 3.3. The most commonly used source of support while at university was a friend (60.7%), while the least frequently used source of support was "other" (0.6%). Of formal mental health support options students were most likely to go to mental health professionals (33.5%). Almost all sources of support were rated as moderately useful on average with the exception of the internet, members of the university support staff, telephone-based support, and 'other' support options, which were rated below this on average.

Table 3.3: Number of students using support options and average rating of usefulness

	Number endorsing use	%	Number giving usefulness rating	Average usefulness rating (range: 1-5)	SD
Close informal support options					
Partner/significant other (e.g. boyfriend, girlfriend)	438	40.7	435	3.70	1.17
Friend (not related)	653	60.7	650	3.68	1.00
Parent/carer	425	39.5	423	3.69	1.11
Other relative/family member	180	16.7	179	3.72	1.07
Broader informal support options					
Personal tutor/academic mentor	170	15.8	168	3.11	1.13
other member of academic staff within university	50	4.6	49	3.24	1.20
The internet/other online support	205	19.1	202	2.77	0.96
Religious leader	24	2.2	24	3.33	1.49
Formal mental health support options					

Peer supporter or peer mentor	19	1.8	19	3.21	1.08
General practitioner (GP) or doctor	288	26.8	286	3.04	1.22
Mental health professional (psychiatrist or psychologist, counsellor or social worker)	360	33.5	357	3.69	1.18
Member of university support staff (e/g/ student wellbeing advisor)	175	16.3	172	2.80	1.26
Telephone based support options (e.g. Nightline, Samaritans)	60	5.6	59	2.71	1.25
Other	6	0.6	6	2.83	1.33

Other sources of support which students reported using were: calling the NHS non-emergency help-line (111) (N=1), Student disability service-assigned mentor and text support via a phone app (N=1), self (N=1), book (N=1), no elaboration/unclear (N=2).

When considering differences in support options used between students with home (N=583), EU (N=251) and overseas statuses (N=242), similar sources of support were favoured, such that friends were the most commonly used source of support for home, EU and overseas students (59.5%, 63.7% and 60.3% reporting use, respectively; chi-squared= 1.33, df=2, p=.514). Similarly, the most favoured formal support option was mental health professionals in all three groups (35.5%, 33.9% and 28.1% reporting use in home, EU and overseas students, respectively; chi-squared=4.24, df=2, p=.120). However, there was a significant difference in the proportion of students stating they had used personal tutors (20.1%, 13.1% and 8.3% for home, EU and overseas students, respectively; chi-squared=19.64, df=2, p<.001). Post-hoc examination of adjusted residuals indicated that home students were significantly more likely to ask tutors for help (p<.001), while overseas students were significantly less likely (p=.002). There was a significant difference in students who reported asking other members of academic staff (5.3%, 6% and 1.7% for home, EU and overseas students respectively; chi-squared=6.49, df=2, p=.039), post-hoc examination of residuals indicated that overseas students were less likely to ask academic members of staff for help, however, Bonferroni-correction meant that this difference was no longer significant. There was a significant difference in the proportion of students asking a religious leader for help (1.4%, 1.6% and 5% for home, EU and overseas students, respectively; chi-squared=10.70, df=2, p=.005), with overseas students significantly more likely to use this source of support (p=.007), although overall numbers reporting using this source were small. There was a significant difference in the proportion of students asking GPs for support

(34.1%, 20.3% and 15.7%, respectively; chi-squared=36.58, df=2, p<.001). While home students were significantly more likely to ask GPs for support (p<.001), overseas students were significantly less likely (p<.001). There was also a significant difference in the proportion of students asking university support staff for support (20.8%, 11.2% and 10.7% for home, EU and overseas students, respectively; chi-squared=18.86, df=2, p<.001). Home students were significantly more likely to use this source of support (p<.001). Figure 3.2 shows the proportions of students endorsing each support type, by fee status. Ratings of usefulness were similar to those reported in the total group, and did not differ between home, EU and overseas students, except for ratings of usefulness for other family members (Kruskal Wallace test=6.40, df=2, p=.040). Post-hoc pairwise comparisons showed that only home and overseas students gave significantly different ratings of usefulness, with overseas students rating relatives as more useful (z=2.36, p=.018). Table 3.4 shows the breakdown of reported sources of support and Table 3.5 shows the average usefulness ratings across home, EU and overseas students.

Table 3.4: Number of students using support options by home, EU or overseas status

	HOME N(%) endorsing Use (N=583 responses)	EU N(%) endorsing Use (N=251 responses)	OVERSEAS N(%) endorsing use (N=242 responses)	Chi-squared (X^2 (p-value)), df=2	Standardized Residual (Bonferroni-corrected p-values)*
Close informal support options					
Partner/significant other (e.g. boyfriend, girlfriend)	239 (41%)	110 (43.8%)	89 (36.8%)	2.58 (0.275)	-
Friend (not related)	347 (59.5%)	160 (63.7%)	146 (60.3%)	1.33 (0.514)	-
Parent/carer	236 (40.5%)	106 (42.2%)	83 (34.3%)	3.76 (0.153)	-
Other relative/family member	98 (16.8%)	48 (19.1%)	34 (14.0%)	2.28 (0.319)	-
Broader informal support options					
Personal tutor/academic mentor	117 (20.1%)	33 (13.1%)	20 (8.3%)	19.64 (<0.001)	Home: 4.18 (<.001) EU: -1.32 (1.000) Overseas: -3.65 (.002)

other member of academic staff within university	31 (5.3%)	15 (6%)	4 (1.7%)	6.49 (0.039)	Home: 1.14 (1.000) EU: -.14 (1.000) Overseas: -2.51 (.072)
The internet/other online support	104 (17.8%)	56 (22.3%)	45 (18.6%)	2.32 (0.314)	-
Religious leader	8 (1.4%)	4 (1.6%)	12 (5.0%)	10.70 (0.005)	Home: -2.07 (.229) EU: -0.78 (1.000) Overseas: 3.26 (.007)
Formal mental health support options					
Peer supporter or peer mentor	10 (1.7%)	3 (1.2%)	6 (2.5%)	1.19 (0.552)	-
General practitioner (GP) or doctor	199 (34.1%)	51 (20.3%)	38 (15.7%)	36.58 (<0.001)	Home: 5.94 (<.001) EU: -2.63 (.051) Overseas: -4.14 (<.001)
Mental health professional (psychiatrist or psychologist, counsellor or social worker)	207 (35.5%)	85 (33.9%)	68 (28.1%)	4.24 (0.120)	-
Member of university support staff (e.g. student wellbeing advisor)	121 (20.8%)	28 (11.2%)	26 (10.7%)	18.86 (<0.001)	Home: 4.34 (<.001) EU: -2.50 (.074) Overseas: -2.64 (.049)
Telephone based support options (e.g. Nightline, Samaritans)	37 (6.3%)	9 (3.6%)	14 (5.8%)	2.57 (0.277)	-
Other	3 (0.5%)	2 (0.8%)	1 (0.4%)	0.37 (0.831)	-

EU: European union
* Reported only for significant Chi square tests

Table 3.5: Average usefulness ratings by home, EU or overseas status

	HOME N giving usefulness rating	HOME M(SD) usefulness rating	EU N giving usefulness rating	EU M(SD) usefulness rating	OVERSEAS N giving usefulness rating	OVERSEAS M(SD) usefulness rating	Kruskal-Wallace test (p-value), df=2
Close informal support options							
Partner/significant other (e.g. boyfriend, girlfriend)	238	3.74 (1.16)	109	3.58 (1.20)	88	3.77 (1.18)	1.86 (0.395)
Friend (not related)	345	3.65 (0.99)	160	3.69 (1.01)	145	3.71 (1.02)	0.56 (0.754)
Parent/carer	234	3.70 (1.11)	106	3.64 (1.06)	83	3.72 (1.20)	0.56 (0.755)
Other relative/family member	98	3.56 (1.06)	48	3.83 (1.04)	33	4.0 (1.12)	6.40 (0.040)
Broader informal support options							
Personal tutor/academic mentor	116	3.11 (1.17)	33	3.09 (0.95)	19	3.16 (1.26)	0.10 (0.952)
other member of academic staff within university	30	3.07 (1.23)	15	3.53 (1.13)	4	3.5 (1.29)	1.92 (0.383)
The internet/other online support	102	2.80 (0.98)	56	2.68 (0.88)	44	2.80 (1.02)	0.65 (0.722)
Religious leader	8	3.63 (1.51)	4	3.5 (1.29)	12	3.08 (1.62)	0.64 (0.728)
Formal mental health support options							
Peer supporter or peer mentor	10	3.3 (1.25)	3	3.33 (0.58)	6	3.0 (1.20)	0.18 (0.915)
General practitioner (GP) or doctor	198	3.12 (1.22)	51	2.78 (1.21)	37	2.97 (1.19)	2.53 (0.282)

Mental health professional (psychiatrist or psychologist, counsellor or social worker)	207	3.68 (1.20)	83	3.83 (1.07)	67	3.54 (1.23)	1.84 (0.399)
Member of university support staff (e/g/ student wellbeing advisor)	120	2.78 (1.24)	27	2.89 (1.28)	25	2.8 (1.35)	0.16 (0.921)
Telephone based support options (e.g. Nightline, Samaritans)	37	(2.49 (1.19)	9	2.78 (1.30)	13	3.31 (1.25)	3.87 (0.144)
Other	3	2.33 (1.15)	2	4.0 (1.41)	1	2 (NA)	2.42 (0.298)

EU: European Union
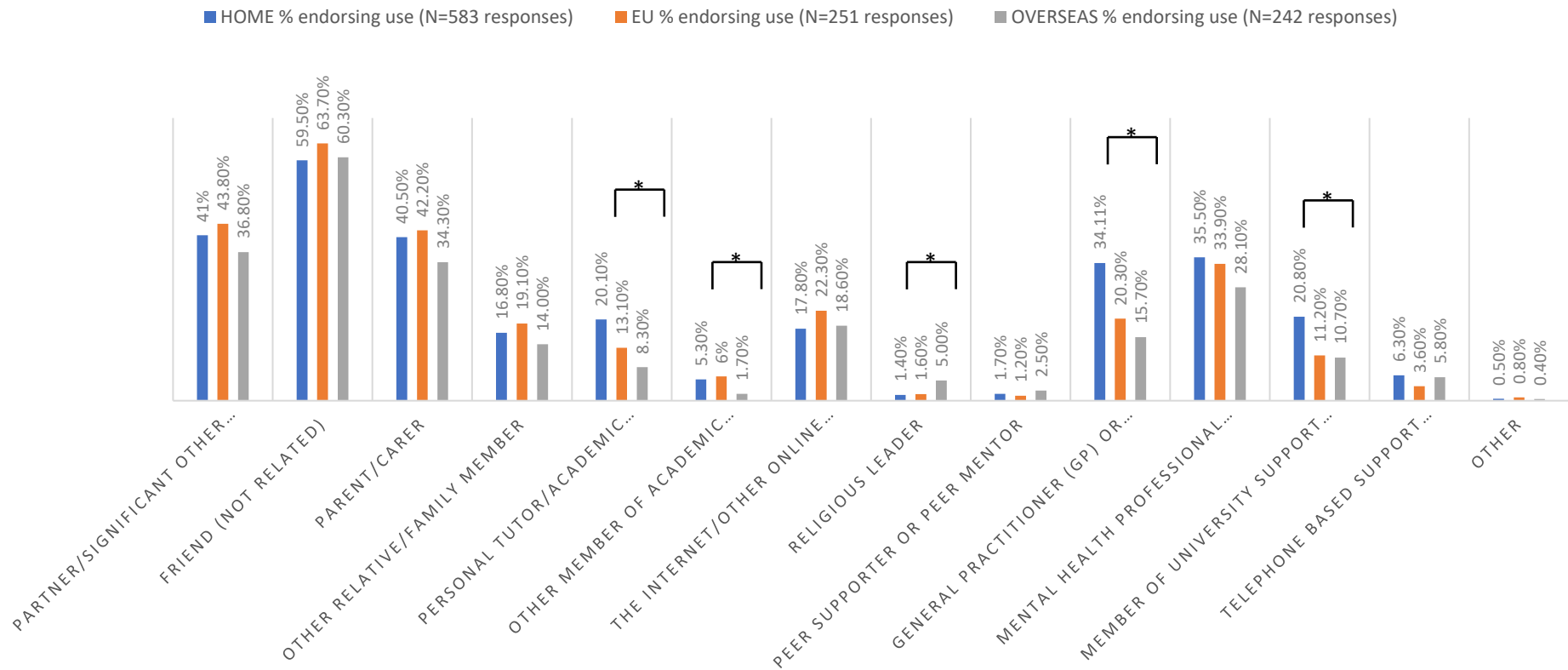
Note: * indicates significant differences (p<.05)

Figure 3.2: Percentage of home, EU and overseas students endorsing use of mental health support options

Barriers to access

Experiencing at least one barrier to access was reported by 859 (79.8%) of students. Of these, 703 (81.8%) had accessed close informal support, 267 (31.1%) had accessed broader informal support, and 384 (44.7%) had accessed formal mental health support options. It was not possible to ascertain for what form of support options the barriers were experienced, although the survey question indicated that barriers reported should refer to mental health support options *available at university*. Table 3.6 summarises the number of students endorsing each potential barrier to access. The most commonly reported barriers were "lack of time" (27.8%), "concern that no one will understand my problems" (26.7%) and "fear of documentation on academic record" (24.7%).

Table 3.6: Endorsements of barriers to access

Barrier	Number of students endorsing barrier	% of total sample (N=1076) experiencing barrier
Lack of time	299	27.8
Concern that no one will understand my problems	287	26.7
Fear of documentation on academic record	266	24.7
Lack of available services	236	21.9
Fear of unwanted intervention	224	20.8
I didn't know where to find help	221	20.5
Difficulty with access to care	193	17.9
Other (please specify)	179	16.6
Stigma of mental health care	151	14.0
Lack of confidentiality	121	11.2

The following barriers were also reported in free-text response by students who responded with "Other (please specify)":

- Assumption that services wouldn't help/negative experiences reported by other students (N=17)
- Better alternatives sought/prefer to re-contact therapist utilised prior to starting at university (N=13)
- Case was too complex for the services (N=5)
- Information on services too confusing (N=2)
- Desire to keep personal and academic problems separate (N=3)

- Dislike of modality of therapy prescribed (N=1)

- Lack of motivation (N=7)

- Fear of academic, career, visa repercussions (N=3)

- Fear of disclosing to a stranger/mistrust of mental health professionals (N=13)

- Concern that information would be shared with parents (N=1)

- Fear support may exacerbate symptoms (N=1)

- Feeling problems are not severe enough/fear of not being taken seriously (N=36)

- Lack of BME therapists (N=2)

- Life events got in the way (N=1)

- Long/difficult application process (N=5)

- Negative previous experience (N=12)

- Nobody to speak to in first language (N=2)

- Not wanting to admit there is a problem (N=4)

- Prefer to deal with problems alone (N=7)

- Fear (N=4)

- Shame (N=4)

- Waiting list too long (N=31)

- No reason given (N=5)

When considering differences in barriers experienced by students with home, EU or overseas statuses, the proportions of students reporting each barrier were similar except in the following instances: "lack of time" (28.3%, 20.7% and 33.9% in home, EU and overseas students, respectively; chi-squared=12.21, df=2, p= .002), with significantly less EU students reporting this barrier (Bonferroni-corrected p=.026), and "fear of documentation on academic record" (27.8%, 17.1% and 25.2% in home, EU and overseas students, respectively; chi-squared=14.71, df=2, p< .001), with significantly less EU students reporting this barrier (Bonferroni-corrected p=.009). Although the highest proportion of home and overseas students reported "lack of time" as a barrier to access (28.3% and 33.9%, respectively), the most commonly reported barrier for students from the EU was "lack of available services" (27.1%). The least commonly reported barrier was "stigma" for overseas students (9.5%), while concerns about "lack of confidentiality" was the least commonly reported

barrier for home and EU students (9.5% and 10.8%, respectively) Table 3.7 and
Figure 3.3 show the full numbers and percentages of students reporting each barrier
by home, EU or overseas status.

Table 3.7: Barriers and facilitators in Home, EU, and Overseas students

Barriers	HOME status students endorsing barrier N(%)	EU status students endorsing barrier N(%)	OVERSEAS status students endorsing barrier N(%)	Chi squared (X2 (p-value)), df=2	Standardized Residual (Bonferroni-corrected P-Values)*
Lack of time	165 (28.3)	52 (20.7)	82 (33.9)	10.81 (.004)	Home: 0.41 (1.000) EU: -2.86 (.026) Overseas: 2.40 (.097)
Concern that no one will understand my problems	155 (26.6)	62 (24.7)	70 (28.9)	1.13 (.589)	-
Fear of documentation on academic record	162 (27.8)	43 (17.1)	61 (25.2)	10.75 (.005)	Home 2.54 (.067) EU:-.18 (.009) Overseas: 0.199 (1.000)
Lack of available services	118 (20.2)	68 (27.1)	50 (20.7)	5.11 (.078)	-
Fear of unwanted intervention	129 (22.1)	43 (17.1)	52 (21.5)	2.74 (.254)	-
I didn't know where to find help	122 (20.9)	48 (19.1)	51 (21.1)	0.40 (.817)	-
Difficulty with access to care	95 (16.3)	53 (21.1)	45 (18.6)	2.86 (.239)	-
Stigma of mental health care	92 (15.8)	36 (14.3)	23 (9.5)	5.61 (.061)	-
Lack of confidentiality	58 (9.5)	27 (10.8)	36 (14.9)	4.24 (.120)	-
Other	100 (17.2)	55 (21.9)	37 (15.3)	4.10 (.129)	-

* Reported only for significant Chi square tests
EU: European Union N: number
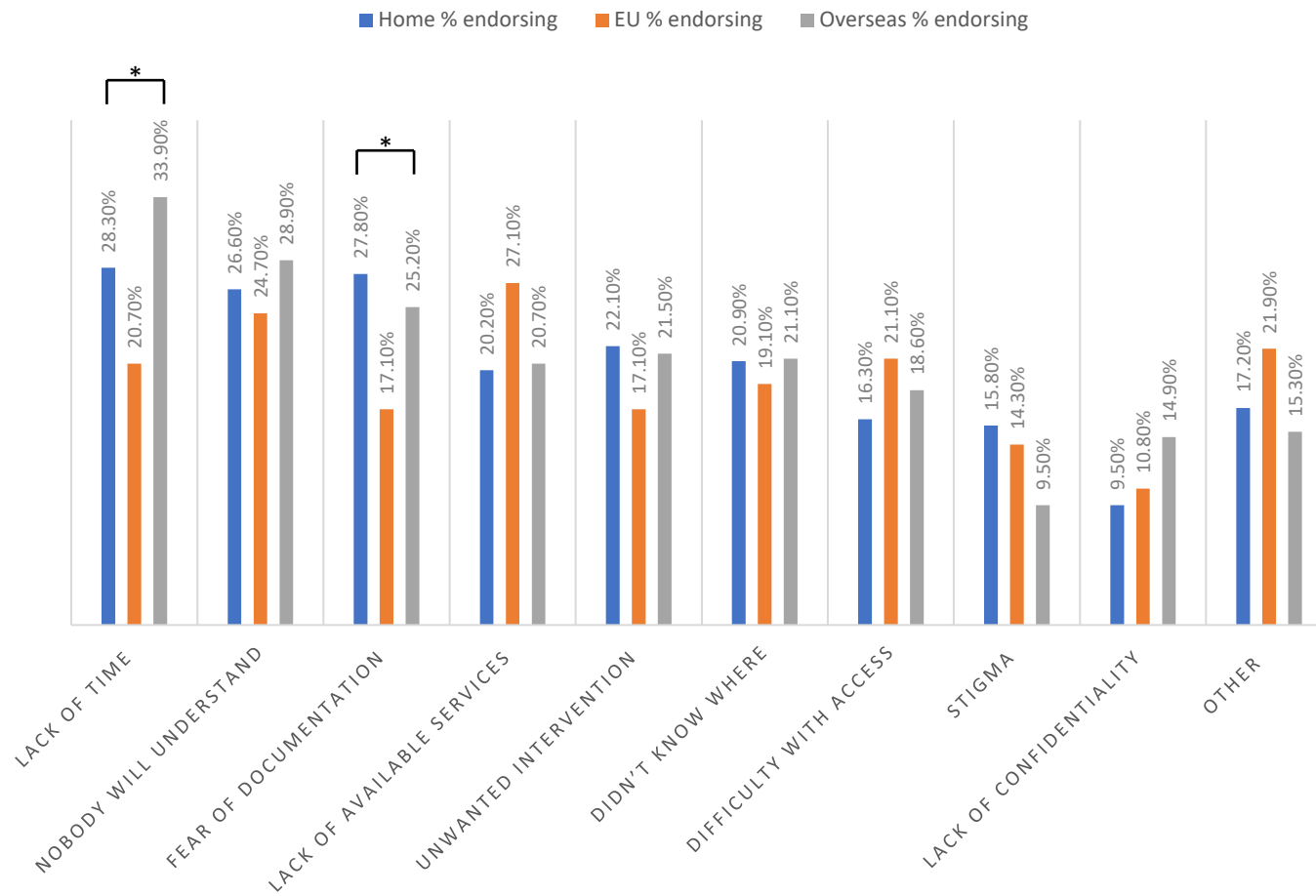
Note: * indicates significant differences (p<.05)

Figure 3.3: Proportions of students experiencing each barrier

3.4 Discussion

This cross-sectional survey found that most students utilise more than one source of support for their mental health symptoms, with less than a third of the sample reporting use of one or less sources. In line with previous literature (D'Avanzo et al., 2012; Nguyen et al., 2019), it was also found that more students utilise informal sources of support, such as partners, friends and family members, which may be indicative of the ease of access and reduced barriers for these sources of support (D'Avanzo et al., 2012; Nguyen et al., 2019). Of those reporting use of formal sources of support, mental health professionals were the most commonly utilised, suggesting that primary care services may have made direct access through self-referral an easier avenue for mental health support over university wellbeing services, which fewer students reported using. This pattern generally remained when examining home, EU and overseas student subgroups.

Despite general preferences remaining broadly similar across home, EU and overseas student subgroups, particularly in the proportions of students using informal sources of support, there were some differences between groups in the proportion of students reporting use of different broad informal and formal sources of support. More home students sought support from personal tutors, GPs and university support staff, with differences being particularly prominent compared to overseas students. Although the reasons for this are unclear (there were few differences in reported barriers and usefulness ratings), the tendency for home students to be more likely to report using mental health support options which are historically associated with being more difficult to access could suggest that some EU and overseas students may benefit from additional help with, for example, registering with a GP in the UK or understanding the additional pastoral role of most personal tutors.

In all students, the most commonly reported sources of support were friends, partners and parents. Although some have argued that international students may have difficulties in accessing such sources of support when away from home (G. Williams et al., 2018), this survey suggests that at least in those responding to the current survey, friends, family and partners (among other informal sources) were still

able to provide mental health support to this group. However, it is unclear whether such interactions are in-person via new friends/partners at university or contact with friends and family back home. Future research could explore whether students who have moved to the UK for university rely more heavily on informal support from old or new social networks, and differences between this in subsequent wellbeing. Furthermore, in general a preference for informal support could suggest that people do not know about or are frightened of accessing services, or that people are less comfortable talking to less familiar people about mental health symptoms, which in turn could impact preference for formal support, as has been suggested in previous research (Ebert et al., 2019; Gulliver et al., 2010; Rickwood et al., 2007; Velasco et al., 2020). This was also reflected in the barriers reported in this study as over a quarter of respondents reported a fear that their problems would not be understood, and 13 students reported fear of disclosing to a stranger explicitly in free-text responses. This suggests that more work should be done to ensure that students feel comfortable talking with formal mental health support providers, for example through additional time provided for an introductory session, and the opportunity to develop a therapeutic alliance, which can be difficult when session limits are imposed (Gavin, 2021). It is however of note that few students reported use of peer support, a form of mental health support which is available from people who are relatable and who can understand fellow student experiences, although this may also be due to more limited availability of this form of support. A potential risk factor for a lack of formal help-seeking may also be a lack of availability of supportive friends, family and partners, as informal support from these sources may facilitate future help-seeking with formal support options (Rickwood et al., 2007; Stunden et al., 2020), and, as outlined in the network episode model (Pescosolido, 1991; see Chapter 1) also act as a contextual cue in which students understand and act upon their experiences of mental health symptoms.

The most commonly reported barrier to seeking support was a lack of available time, although EU students were less likely to report this barrier. This barrier is difficult to address, since as shown in Chapter 2, research suggests that provision of more sessions in treatment (and therefore spending more time in treatment) produces larger treatment benefits. Previous research has also reported that many students who do contact their GP, for example, do not feel they are given adequate time to

discuss their symptoms or treatment (Batchelor, Pitman, Sharpington, Stock, & Cage, 2020), highlighting that making a clear plan for making treatment fit with increasing time demands of students is challenging.

It was also interesting to note that ratings of usefulness tended to centre on "moderately useful", with little variability between support 'types'. While not necessarily negative, no source of support was rated as "extremely" or "very" useful, indicating room for improvement and corroborating previous research indicating some discontent with available support (Quinn et al., 2009). Difficulty here lies in how best to improve sources of support- many informal sources of support are as such because they are outside the confines of university policy on mental health treatment. However, education for students and families in how best to support loved ones is one possible solution. Efforts to adapt formal sources of mental health support may have wider implication, and such efforts may lead to more students endorsing their use. Improvements may be gained through adaptation of support services in collaboration with students to make them more relevant to the difficulties being faced, facilitate routes to care and advertisement of support staff to improve the sense of familiarity students feel, and remove barriers experienced. Additional support for this need comes from the number of students reporting that they did not use formal support within university because they felt alternatives outside of university would be better or because of reports from others of negative experiences of university support- a comparatively large number of responses were along these lines, given that it was not an option given in the survey and therefore was reported in free text.

3.4.1 Limitations

This study also poses some limitations. Primarily, survey designs are often sensitive to self-selecting bias (Wykes, Sweeney, & Guha, 2019) and as this survey was optional, and only completed by 7% of the student population, which is at the lower end of response rates seen in other student mental health surveys (Auerbach et al., 2016), it is possible that these responses cannot be generalised to all student groups. Future efforts to capture the experiences of student populations may benefit from additional targeted recruitment strategies, for example enlisting the support of

student unions or engaging with student representatives. Additional consideration should be given to reaching those who are less likely to respond to mental health surveys, for example males and ethnic minority groups. A further limitation is that participants were sampled from only one university; it is unknown whether these findings reflect student bodies of other institutions. However, the current findings follow trends reported in previous research, in particular preference for informal support options. Nevertheless, these results should be interpreted within their context.

Additionally, responses regarding barriers to treatment provide only a surface level examination of the experiences of students who may wish to access formal support options. For example, further information on the reasons why students felt they did not have time (perception that treatment is extremely long, or competing academic demands, or other such reasons) would facilitate proactive measures to counteract such barriers. Differences in barriers experienced by those accessing informal compared to formal support were also not available. Future research should seek to gain a deeper understanding through in-depth qualitative research with students using mental health services, who could also advise on avenues for improvement based on direct experience. Longitudinal research may also provide a more complete picture of changes in student preferences for particular forms of support over the course of their time at university.

3.4.2 Conclusions

Overall, there are some differences in preferred sources of mental health support and experienced barriers between home, EU and overseas students. Notably home students are more likely to utilise GPs when seeking formal support and to make use of personal tutors compared to other students, while fewer EU students report lack of time and fear of documentation as barriers to help-seeking compared to home or overseas students. However, the majority of students prefer to rely on informal support for mental health symptoms. Although difficult to generalise to other universities, these results give some evidence for the importance of social support when attending higher education, and suggests a need to provide information on all available avenues of support to international students.

Chapter 4: "Five hours to sort out your life": A qualitative study of university students' experience of mental health support

Publications relating to this chapter

The work in this chapter can be found in the following publication: Barnett, P., Arundell, L. L., Matthews, H., Saunders, R., & Pilling, S. (2021). 'Five hours to sort out your life': qualitative study of the experiences of university students who access mental health support. BJPsych Open, 7(4).

4.1   Introduction

Chapter 3 suggested that students may favour informal sources of support over more formal mental health treatment, due to range of barriers that prevent use of university-based and other formal support. However, the cross-sectional survey design was not able to facilitate an understanding of reasons for these barriers or how they can be addressed, thereby allowing adaptation of services to address student concerns. This necessitates additional in-depth follow-up research.

Current support systems in universities may need to be re-structured to better identify, assess and respond to the needs of students. This may help to encourage uptake of services, thus maximising on an opportunity to foster better mental health and wellbeing in young people at a crucial point in their lives. Previous research has noted that students report dissatisfaction with available services, citing an over-reliance on medication and insufficient continuity of care as reasons for this (O'Keeffe et al., 2018). Involving students in service design could also positively influence aspects of treatment provision currently concerning students, such as lack of choice regarding treatment options (Farrer, Gulliver, Chan, Bennett, & Griffiths, 2015; Quinn et al., 2009) or time available alongside studies or academic considerations (Czyz, Horwitz, Eisenberg, Kramer, & King, 2013). Participatory design methods have proven effective in cultural adaptation of support for young people (Ospina-Pinillos et al., 2019), suggesting that similar methods could be usefully integrated into design of services for all university students. Though previous efforts to make interventions more 'student friendly' have failed to demonstrate

improved outcomes (Barnett, Arundell, Saunders, Matthews, & Pilling, 2021), a service delivery model which takes the opinions and experiences of students into account may fair better than adaptations to interventions developed solely by professionals. Such an approach to restructuring current support systems, drawing on student experiences and expectations, may better identify, assess and respond to student needs.

4.1.1 The importance of qualitative research

To better understand how service provision could be improved, a qualitative approach to exploring experience can be helpful. Previous qualitative research has explored the perceptions of young adults of GPs as a potential source of help for mental health problems (Biddle, Donovan, Gunnell, & Sharp, 2006), finding that GPs tend to be seen as potentially dismissive of patients seeking help for mental health problems and lacking in experience for a "non-physical" illness. Other work has explored how being diagnosed with a mental health disorder can impact on experiences during university (Demery, Thirlaway, & Mercer, 2012; Kain, Chin-Newman, & Smith, 2019), highlighting the multiple obstacles in terms of seeking treatment, navigating a new social environment and disclosure of diagnosis to peers and staff as well as difficulty keeping up with academic goals. Finally, an exploration of the experiences of students who have accessed campus-based mental health support was conducted by Quinn et al. (2009), who highlighted the impact of stigma in help-seeking and problems with communication between NHS and university-based mental health services in continuity of care. However, over ten years after the publication of Quinn and colleagues' findings, it is important to re-visit how the needs of students at university are reflected in and responded to in the services available there. Furthermore, an understanding of how experience of care compares to the expectations of students, and what students would want to change could promote additional engagement of students experiencing mental health problems.

In depth, qualitative interviewing techniques can facilitate this goal, as they generate rich data which can highlight nuances in experiences which may be missed using other quantitative techniques. Such studies also allow a complex phenomenon to be understood within a specific context (R. B. Johnson & Onwuegbuzie, 2004), which is

likely to be of use in generating implications for policy and practice, particularly in healthcare. Therefore, qualitative research embedded within a broader research program of both quantitative and qualitative exploration (such as the exploration of student service use through both quantitative surveys (Chapter 3) and qualitative interviews (this chapter) can provide a fuller understanding of the difficulties faced by students.

4.1.2   Chapter aims

The aim of this chapter was therefore to conduct in-depth interviews with students from a variety of backgrounds to gain an understanding of 1) how students experience the process of accessing and using in-house mental health support services at a specific institution 2) the barriers and facilitators to treatment, and reasons behind negative or positive experiences and 3) student recommendations for further service development.

4.2   Method

4.2.1   Study Design and Theoretical Perspective

An individual semi-structured interview method was employed, taking an exploratory approach to student experiences of support received for mental health problems at university. A further, confirmatory focus group was also undertaken to validate themes, and confirm that they accurately reflected participant experience. This research took a realist approach to research design and interpretation, with specific interest in experiences as reported by participants in the context of a single UK university. As a result, conceptualisations of experience remained close to the data rather than focusing on higher order notions of semantic meaning.

4.2.2   Ethical Approval and Informed Consent

The study was approved by the University Ethics Committee (14643/001) prior to commencement of the study. Informed written consent was obtained from each subject prior to participation in the semi-structured interview. Further consent was sought if participants agreed to participate in the focus group.

4.2.3 Participants

University students (N=16) who had accessed any of the mental health support services at the university (including university-provided wellbeing, counselling and psychiatric services) were recruited. An aim of sampling was to recruit a diverse range of participants in terms of age, gender, ethnic group, student status (undergraduate/postgraduate), subject studied, and reported mental health problems, in order to provide a range of background experiences which may impact access to and experience of treatment (M. Q. Patton, 2014). Participants responding to a university-wide mental health survey ("SENSE Survey," 2020), which is described in Chapter 3, stating they had used the university mental health services, studied full time, and who consented to contact regarding further research participation opportunities were eligible for participation. A purposive sample was contacted via email with an invitation to participate, however, due to lack of response from participants who identified as male or non-binary, the final sample was limited in its over-representation of female students. Participant characteristics are displayed in Table 4.1. Focus group participation was open to all participants from the interview stage who all agreed to further contact regarding a follow-up focus group. They were emailed with an invitation to participate and five of the 16 participants responded and participated in the focus group. These five participants consisted of 3 females and 2 males. Four were undergraduate students and one was a post-graduate student. Three were white British while one was from an "other Asian" background and one reported being of mixed ethnicity. All focus group participants were from the UK.

Table 4.1: Interview participant characteristics

Variable		N=16	%		N=16	%
Gender	Female	13	81.0	Male	3	19
Age	20 - 24	9	56.3	25 - 27	7	43.8
Ethnicity	White British	5	31.3	White Non-British	5	31.3
	Mixed White	1	6.3	Chinese	1	6.3
	Other Asian	3	18.8	Other mixed background	1	6.3
Sexual Orientation	Heterosexual	8	50.0	Homosexual	1	6.3
	Bisexual	2	12.5	Other	1	6.3
	Prefer not to say	4	25.0			
Religious belief	No religion	9	56.3	Muslim	1	6.3
	Christian	2	12.5	Spiritual	1	6.3

	Buddhist	1	6.3	Prefer not to say	2	12.5
Relationship status	Relationship: not cohabiting	3	18.8	Single	10	62.0
	Cohabiting	3	18.8			
Fee status	Home	7	43.8	EU	5	31.3
	Overseas	4	25.0			
Degree Level	Undergraduate	10	62.5	Post-Graduate Taught	3	18.8
	Post-Graduate Research	3	18.8			
Degree subject	English literature	2	12.5	Language and international studies	2	12.5
	Psychological sciences and related disciplines	2	12.5	Bioscience	2	12.5
	Medicine	2	12.5	Computer science	1	6.3
	History	1	6.3	Philosophy	1	6.3
	Information studies	1	6.3	Combined arts and science degree	1	6.3
	Prefer not to say	1	6.3			
Year of study	First	6	37.5	Second	5	31.3
	Third	3	18.8	Fourth	1	6.3
	Fifth	1	6.3			
Accommodation type	Private sector halls	1	6.3	Parental Home	2	12.5
	Other rented accommodation	8	50.0	Prefer not to say	5	31.3
Year started degree	2013	1	6.3	2015	2	12.5
	2017	4	25.0	2018	4	25
	2019	5	31.3			
Mental health disorders reported	Generalized Anxiety Disorder	8	50.0	Depression	6	37.5
	Bipolar Disorder	2	12.5	Eating Disorder	3	18.8
	Panic Disorder	4	25.0	Obsessive Compulsive Disorder	2	12.5
	Post-traumatic Stress Disorder	1	6.3	Social Anxiety Disorder	1	6.3
	Borderline Personality Disorder	1	6.3	Autism Spectrum Disorder	3	18.8
Treatment(s) utilised currently	Therapy, Counselling or coaching	16	100	Medication	8	50
Support providers in contact with	GP	9	56.3	Mental health professional	16	100
	University Wellbeing services	16	100	Telephone support	5	31.3

4.2.4 Setting

This study was conducted at an inner-city UK university with a highly diverse student population of undergraduate and post-graduate students, and a large proportion of international as well as UK-based students.

4.2.5 Materials

Semi-structured interviews provided the opportunity for students to freely express themselves and for new ideas to emerge, while facilitating a conversational focus on experiences of specific aspects of treatment, to best allow for comparison across participants. The interview schedule was developed based on previous research (Mowbray et al., 2006; Quinn et al., 2009) into potential areas of difficulty in university mental health support delivery and aimed to gain a sense of experiences of mental health support, prior expectations of what support would be available at university and how this compared with reality, and recommendations for improvement. The semi-structured interview schedule was piloted with five students (who did not participate in the main interview study) with experience of mental health problems to ensure the correct language and topics were covered, in order to minimise distress and maximise relevance. Details of the interview schedule, and resulting adaptations from the piloting process are available in Appendix 4.1.

4.2.6 Procedure

Qualitative information was gathered in a two-step process.

Interview

Firstly, semi-structured, individual telephone interviews were conducted with participants. Interviews were conducted via telephone due to the COVID-19 pandemic and lockdown restrictions which prevented face-to face interviews. Interviews were ongoing until the point of data saturation (when additional interviews did not elicit additional new information and further coding was no longer feasible (Guest, Bunce, & Johnson, 2006)). Interviews were audio recorded and transcribed verbatim and lasted 36 minutes on average. Participants were paid £15 for their time. Prior to the commencement of the telephone interview, all participants signed a consent form electronically and provided optional demographic details (See Table 4.1).

Focus Group

During the second stage, a video-conference focus group with five students (who had also participated in the interview stage) allowed theme structures established through thematic analysis of interview transcripts to be discussed. Visual presentations of each theme (and relevant sub-themes) were presented to the group in a secure videoconferencing program, and time was given to provide suggestions for modifications or additional information. Facilitation ensured that all participants had an opportunity to speak, and additional communication via email was encouraged for any further thoughts that participants may not have felt comfortable to discuss in a group context. However, no additional comments were received after the focus group. This focus group lasted 46 minutes and participants were compensated £10 each for their time. The use of individual interviews followed by a focus group allowed for triangulation of the data through 'member checking' (Carter, Bryant-Lukosius, DiCenso, Blythe, & Neville, 2014), the provision of different perspectives which complement each other (Carter et al., 2014; Kaplowitz & Hoehn, 2001). The focus group was also conducted electronically to adhere to social-distancing guidelines imposed during the COVID-19 pandemic. Both the interviews and the focus group were kept informal to maximise the feeling of alliance between the researcher and the participants.

4.2.7 Data Analysis

A thematic analysis was conducted of interview transcripts (Braun & Clarke, 2006). Thematic analysis was deemed the most appropriate method due to its flexibility in theoretical stance (Braun & Clarke, 2006; Terry, Hayfield, Clarke, & Braun, 2017). NVivo 12 software was used to facilitate this process (QSR International Pty Ltd, 2018). The study took an exploratory, inductive approach to analysis in order to capture emergent experiences from the process of seeking mental health support at the university. However, it is important to highlight that interview questions were research-based, and piloted prior to the start of the study, and therefore the analysis was likely impacted both by researcher theory and epistemological position (Terry et al., 2017). One researcher first read each transcript independently and highlighted initial themes emerging from the data. Next, codes were organised into higher-order themes which represented important aspects of experience (Braun & Clarke, 2006).

Themes were then reviewed by a second researcher separately, and differences in conceptualisation of a sample of the data and the themes identified were discussed, leading to developments to the original codes. A hierarchical thematic framework emerged as data analysis progressed. Analysis of the focus group, which was conducted after the first review of themes, provided additional context and validation of the generated themes, allowing the resulting framework to stay firmly grounded in the experiences of participants. The final coding structure was discussed and agreed upon by all authors. Transcripts were then re-coded according to the finalised framework.

4.3   Results

Five main overarching themes were identified and are represented in Figure 4.1: *Personalisation and informed choice* (subthemes: 1. Services for all disorders and levels of severity 2. Taking preferences into account), *Simplifying the process* (subthemes: 1. Importance of collaboration across services and staff 2. Uncertainty 3. The need for clear simple information on accessing support), *Feeling abandoned, ignored or invisible* (subthemes: 1. Faceless and lost in the crowd 2. Feeling let down 3. Abandoned) *Stigma* (subthemes: 1. Dismissing symptoms as stress, 2. Raising awareness and normalising mental health problems 3. Shame or embarrassment 4. Doing better than most), and *Superiority of private and external services* (subthemes: 1. Student support advice not being helpful 2. Having to pay for good treatment 3. Student support functioning as just the start of the journey).
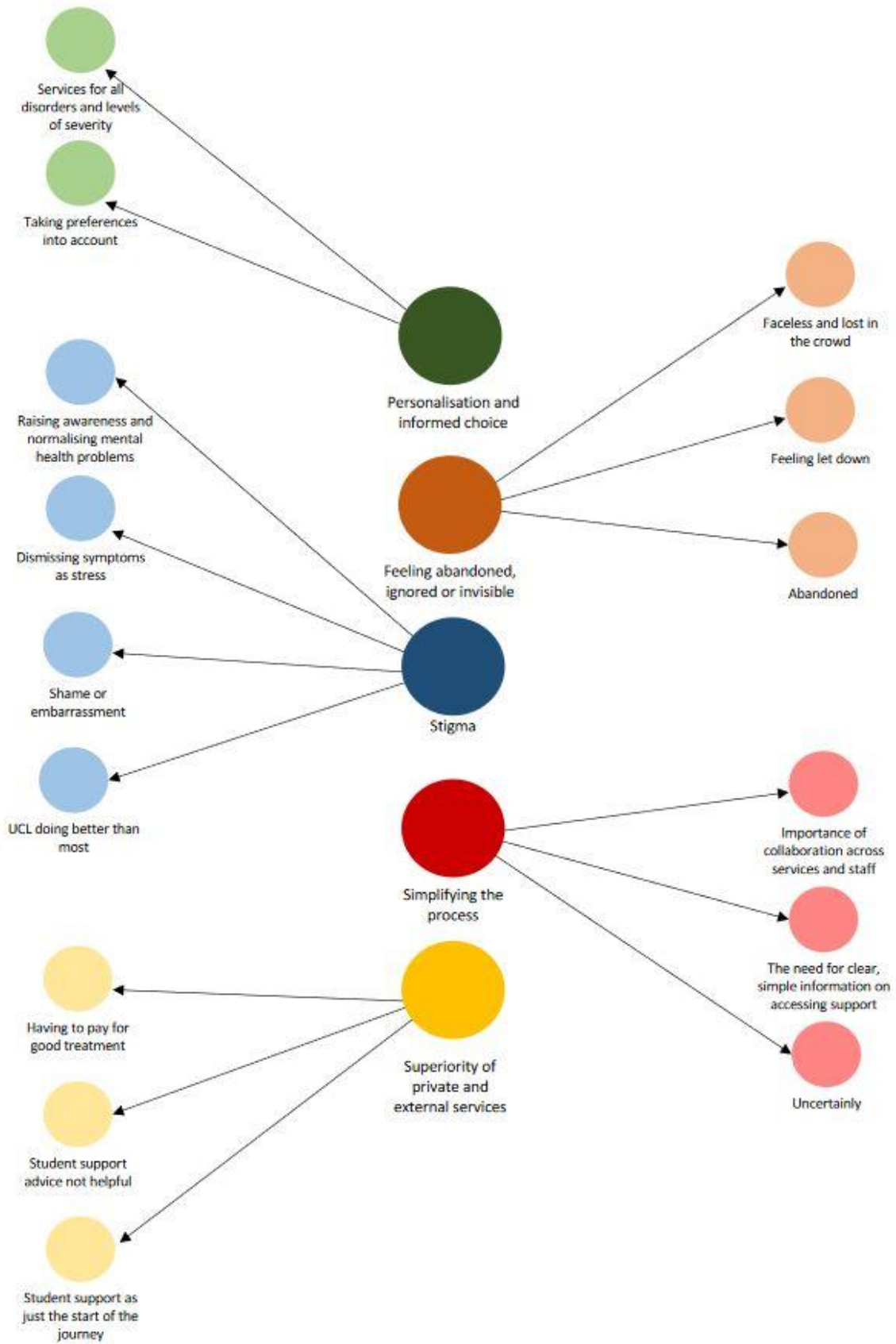
Figure 4.1: First and second order themes

4.3.1 Personalisation and informed choice

Personalisation and informed choice was highlighted as an important aspect of mental health support by all of the 16 interviewees. Students spoke of wanting support that was appropriate for all students in need of help, regardless of the complexity or severity of their symptoms or diagnosis. The importance of preventing any student from feeling excluded from support was emphasised.

"it comes across as psychological services for people with diagnosed conditions or specific mental health conditions. So maybe just having more like clarity in the sense that like it can be about anything, even if it's just like a difficult time." [Participant (P) 8]

"I find that it revolves a lot around anxiety, depression and that but they don't really talk about eating disorders, for example, which are really present in [the city] and our age … in the myriad of fliers that I got in my first year, I wish I'd gotten one on that too" [P13]

Topics covered when discussing choice included choice of treatment, treatment provider and appointment time.

"I kind of asked to see a CBT … but the admin say [sic] … that whether I get referred to have CBT is up to my psychiatrist." [P14]

The feeling that sometimes change, personalisation or choice couldn't be requested owing to a sense that "anything is better than nothing" was also frequently mentioned.

"for me, it was like a pressure to feel like I should be grateful for it. Like, given the state of the NHS, the underfunding of mental health services and a long waiting list with those, then just the fact that my university was offering something. I felt like, even though it was only six x 15-minute sessions, which is like five hours to sort out your life, I still felt like I had to be grateful that I'd been seen" [Focus group (FG)]

A more detailed description of subthemes and example quotes is available in Appendix 4.2.

4.3.2 Simplifying the process

Despite a wish for more within-service variety of care, the need for simplification of the process of first accessing support was often described. It was frequently mentioned that more collaboration, both between mental health support and academic staff, as well as between different support services, may help to reduce the confusion around the journey to accessing help. In particular, students were keen for additional training for academic staff so that they were better equipped to help students navigate the complexities of the support system:

> *"I think it's [training] really important because … they might be the only contacts that a student is actually having with staff … it's not an easy thing to be like 'Oh I'm struggling and I need some help'"[P9]*

> *"But I feel like the tutors should at least know where to signpost and have the support and all of that practice just integrated into how they teach."*
> *[FG]*

Furthermore, collaboration within available mental health support services (including the student wellbeing service, counselling services, and disability services) was felt to be necessary, due to the current disjointed and confusing framework for care. Clearer, less overwhelming information and a single route for accessing mental health support were deemed important priorities for services. Though students also discussed the importance of continuing support throughout referral for those who need it.

> *"they really need to like make a service that's support for everyone under one roof. Because right now, there's like student counselling services, which is different to student psychological and that's really confusing. Because surely they should be under one umbrella and then you can just*

send them to different people. Why are they two separate names? It just doesn't make sense."[FG]

Many students felt "lucky" to have experienced mental health problems prior to university, as the lessons learnt through this experience, rather than university-based information, had given them the knowledge and skills needed to access support. Students with less experience described the uncertainty they felt over what to expect from university support.

"I have a privilege in that I know how to advocate for myself because I've done it before and I know how to be pushy and I don't feel like embarrassed about doing that" [P9]

"I had no idea who this person was and what I was supposed to speak about with them, if it was coursework, anxiety or personal issues." [P10]

A more detailed description of subthemes and example quotes is available in Appendix 4.3.

4.3.3 Feeling abandoned, ignored or invisible

Students frequently alluded to feeling insignificant among such a large student body. It was felt that efforts to make aspects of the experience more personal may encourage students to come forward and ask for help, instead of going unnoticed:

"a lot of people sort of slip through the net. … I was sort of within halls last year and I think that was probably the main sort of place that felt any kind of community, really. So yeah, particularly if someone wasn't … it'd be very easy for these things to kind of get missed." [P4]

Extensive bureaucratic tasks before being able to speak to someone exacerbated this, and was highlighted as particularly difficult when students sought help with significant levels of debilitating symptoms. Descriptions of the benefits of a more

welcoming environment and how influential this can be in alleviating feelings of invisibility and promoting positive experiences were given by a few students:

"But I felt that before I could actually speak to like a real person, I had to go through so much, filling in forms and sending emails and yeah, like months, I'm talking about months and months."[P11]

"the lady who was on the front desk at SPS, she's lovely, she's really friendly and very helpful, really approachable and like very kind and understanding, I found anyway when I spoke to her, she was lovely."[P9]

However, stories of being 'let down' and abandoned by services, either through getting lost in the system, being left waiting when in crisis, or having sessions stopped were frequent:

"I feel like she [the therapist] just didn't manage to keep her promise."[P1]

Despite this, students presented thoughtful and understanding emotions surrounding the difficulties in provision of support for such a large student body, and were often understanding of the logistics, particularly those with previous experiences of NHS waiting lists:

"I don't know if it could be better … because I know that in general waiting lists for counselling or psychological service is quite long …, so I don't know if one month is good. But to me I think it's really good … I thought it was going to be like a year or something." [P14]

A more detailed description of subthemes and supporting quotes is available in Appendix 4.4

4.3.4 Stigma

Stigma was a topic brought forward by the interviewer. In response, students spoke of it as a multi-faceted problem which they agreed was difficult to address. For

example, many felt that stigma led to students dismissing their own symptoms of mental health problems as "just stress." This undermining of difficulties faced by the self was seen as a key barrier in seeking support:

> *"I think actually recognising it in yourself can be a difficult thing and just you can convince yourself that it is just stress and it is just normal, when in fact, it might require more extensive support ... ." [FG]*

This dismissal extended beyond self-dismissal to dismissal by peers and even by support providers, making students regret reaching out:

> *"in first year I was a lot misunderstood [sic] by my group of friends. So they thought I was, like, bluffing or I was just stressed."[P2]*

> *I'm not quite sure what she [the therapist] was sort of aiming for but she kept saying that she didn't think I seemed very anxious as a person and she wasn't sure that I really had a problem with anxiety. I felt quite undermined by that" [P5]*

As a solution, the importance of encouraging more discussion of mental health problems was considered as a means of "normalising" the experience and encouraging students to reach out. This was deemed particularly important among fellow students so that mental health problems can become less stigmatised, and students felt less alone in their difficulties. Similarly, it was felt that investing in more peer support may allow reduction of stigma due to the ability to engage with people who understand and can help navigate the system.

> *"If it's normal that sometimes people struggle and sometimes they need help from a therapist, then people are more inclined to do it."[P16]*

More generally, students described the shame and embarrassment associated with having a mental health problem, when students felt that they were not able to cope as others seemingly could:

"even though UCL tries to deconstruct it a lot, there is quite a bit of stigma around it and I think it's difficult for some students to admit that they need some support … And also amongst friends, so we can all talk about how nervous we are for exams or for whatever it is, but then really talking about the deeper personal issues that wouldn't be appropriate in that context or with new friends in your first year or something like that, I think it's difficult to kind of overcome like that sense of being alone in it…."
[P13]

However students did highlight that the university was doing better than other universities and countries in its focus on the reduction of stigma, indicating that efforts had not gone un-noticed.

"I come from a very small university where mental health problems are simply not discussed. But they certainly exist, and I found UCL's approach actually quite refreshing ... UCL are doing certainly a better job than most institutions, which to be honest could not have been hard, but they're good." [P16]

A more detailed description of subthemes and example supporting quotations is available in Appendix 4.5

4.3.5   Superiority of private or external services

Although many students were extremely grateful for the support provision at the university, and the time and effort put in by staff to allow for such an extensive service, some discussed decisions to seek support outside of university, giving a number of reasons for this. A desire to understand the deeper causes of problems was often alluded to, something students felt was limited in university support options, though they acknowledged this was due in part to limitation on treatment sessions:

"sometimes it just felt like … I could just open up about my past and everything, but then it's going to kind of wind up back to … 'How can we

help you cope now rather than deal with the underlying issues.' …

because that takes time and that's what they didn't have." [P3]

Professionalism was also mentioned by some students, who felt that seeking external support would allow them to speak about their mental health symptoms with a more qualified professional, something they did not feel they had experienced as part of the university services. This likely stemmed from a confusion regarding available services, and which services were best suited to particular mental health problems. This meant that students in need of professional support were not able to access it due to their point of access being to more generic support services:

" I think I was expecting a more legitimate psychiatry form of diagnosis

and it turned out there would be no diagnosis but only sort of chatting

about the problem and giving some CBT." [P15]

As a result, many reported that while not ideal, paying for services would gain you better support with less wait, though others felt that university services were an excellent starting point for informing further support choices:

"that's mainly why this entire thing worked out because my parents were

able to pay for that."[P12]

"it was quite helpful for me because I don't think I would have thought

about seeing somebody privately otherwise." [P5]

A more detailed description of subthemes and example supporting quotations is available in Appendix 4.6.

4.4   Discussion

This study describes the experiences of university students in accessing and receiving help for mental health problems. It is intended to inform the development and adaptation of services for mental health support to students. Despite the single centre approach to this study, findings resonate with existing literature in a number of

areas. Students hoped for better integration across services to streamline the process of accessing support (Wood et al., 2018), and reduce or remove the negative experiences of dismissal or abandonment which seemed to hinder intentions to seek further help (Crumb, Crowe, Averett, Harris, & Dart, 2019; Gulliver et al., 2010). Interviewees expressed concern for the many students who may not seek help due to stigma, uncertainty over how to initiate contact with services or feeling that the problems they experienced were not severe enough (or too severe). This corroborates with previous research where students felt there needed to be more clarity on what was encompassed by the term "mental health difficulties" (Quinn et al., 2009), so that students would not wonder if their personal experiences "fitted" the requirements of services, or fear over-reacting or seeking help for a "false alarm" (Biddle et al., 2007). Students also reported feeling that having experience of accessing services before arriving at university was an advantage, highlighting the importance of ensuring that students are fully aware of the routes to support and how to access services before arriving, and to be able to do so before reaching the point of crisis. However, although entering university may be a challenging time for the mental health of all students (Cleary, Walter, & Jackson, 2011), it is not currently clear how best to engage those without previous experience of, or treatment for, a mental health disorder. Discontent with the choice of available treatment, reflected in this study, has also been raised in previous research (Farrer et al., 2015; Quinn et al., 2009). This suggests a need for the student voice to be at the heart of service design (Hughes & Spanner, 2019; Piper & Emmanuel, 2019) to inform the implementation of evidence based practice.

Students were also not always clear about the qualifications and experience of the treatment provider they were seeing. While in many instances this resulted from a lack of clarity over the correct route of access to see particular mental health professionals, it also indicated that providing clear information to reassure students that all therapists, counsellors and psychiatrists are trained and competent to support their needs could be beneficial. This may also help to ensure that disparities in wellbeing at university are not based on differences in abilities to pay for treatment from external private providers.

The findings also raise a number of questions of how best to respond to these emerging recommendations. A tension emerged between simplicity and complexity. Hopes for a simplified route to access, with straightforward information, were coupled with discussion of the need to extend choices of treatment, provider and levels of support. Similarly, while many students fear seeking support may result in stigmatising diagnoses (Gulliver et al., 2010), some students reported accessing services particularly to obtain clarity on a possible diagnosis in this study. These contrasting needs are challenging to resolve, but recent work (Vallianatos et al., 2019) has found that combining a range of on and off campus support services within a single "network" of support, which involves regular discussion between participating organisations to support the referral process would be beneficial. This fits with students' expressed desires to be supported through referral processes rather than feeling "abandoned" to seek alternative support. Such a network could also aid in expansion of services to widen relevance to a broader range of mental health disorders, for example eating disorders- the recently published UK policy document "University Mental Health Charter" (Hughes & Spanner, 2019) proposes that complex problems will be more efficiently addressed through combining expertise and resource, including NHS and other external services. This aligns with experiences noted both by students (Quinn et al., 2009) and researchers into university mental health services (Bani, Zorzi, Corrias, & Strepparava, 2020; Batchelor et al., 2020).

The current study also suggests that more could be done to combat feelings of invisibility. A more proactive approach to ensuring that students feel part of the student community and that there is a wider system in place to support them in their academic studies appears important. For example, some students reported that having a personal tutor who took a more active role in checking in on their wellbeing alongside academic duties positively contributed to their experiences. Students also expressed a desire for more integrated peer support and a university-wide conversation surrounding mental health. This may also contribute to combatting stigma, an ongoing negative effect of the experience of mental health problems at university. Although few students reported using peer support services in Chapter 3, additional efforts to connect students to peers with experience of mental health problems and also to the wider community may prevent isolation and instil a sense of

community (Batchelor et al., 2020). This may also reduce feelings of invisibility and, as also recognised in both Chapter 3 and other models of help-seeking (Biddle et al., 2007; Pescosolido, 1991), facilitate a culture of seeking support where problems are shared rather than borne alone (Pernice, Biegel, Kim, & Conrad-Garrisi, 2017). Peer and social support may be particularly important for international students or those from ethnic minority backgrounds (Thomas & Brausch, 2020), including international students, particularly given that they may be less inclined to seek mental health support via tutors or GPs (Chapter 3).

Despite these calls for change, students expressed gratitude towards those academic and mental health service staff who made a positive difference to their experiences. While this study places its focus on how best to improve service delivery within universities, participant experiences were often contextualised with an understanding of the difficulties faced by universities, particularly those with large student bodies, in providing adequate mental health support for all in need.

4.4.1 Limitations

This study has a number of limitations which should be noted. First, the sample size of this study was limited to16 participants, and weighted heavily towards females (13/16). While this warrants caution in the generalisability of experiences, it is important to highlight the diversity of the sample in terms of ethnicity, home or international student status, and degree level. The broad consensus across students in their opinions, despite different experiences in mental health problems, the experience of care and study commitments supports the generalisability of conclusions. Furthermore, the recurrent emergence of themes suggested that data saturation had been achieved, although it is possible that additional male participants may have presented additional views. A second potential limitation is that interviews were conducted via telephone rather than face-to-face due to COVID-19 restrictions. Whilst interviewees may have been more willing to talk freely and disclose more sensitive information when speaking over the telephone (Novick, 2008), the possibility of yielding different findings through face-to-face interviews should be acknowledged. Finally, transcripts were not double coded in their entirety, although themes and subthemes were discussed with other members of the research team,

and validated using a proportion of the data. Furthermore, a key goal of the research was to interpret student perspectives. Within this epistemology, a quantification of inter-coder-reliability becomes counter-intuitive (Braun & Clarke, 2013; O'Connor & Joffe, 2020). However, conclusions should be interpreted within the perspective of the author, a PhD student with interests in, and personal knowledge of people experiencing mental health problems. Being a PhD student may however have positively contributed to limiting the potential negative impacts of power dynamics on discussions, through encouraging a more open and frank discussion with students compared to that which might have been achieved with a more senior staff member. The conduct of a confirmatory focus group with participants to discuss interpretations acted as a further means of triangulation alongside discussion with co-authors to check potential biases and reasoning (Berger, 2015).

4.4.2 Conclusions

This study contributes to the existing evidence indicating the need for simple and clear access routes to mental health support for students, and an approach to treatment provision which incorporates collaboration across university and external mental health services to ensure support is available to all who need it. Themes suggest that current experiences of care can contribute to feelings of isolation and abandonment, and additional efforts to establish support networks, potentially through peer-support, may be beneficial and provide a platform to normalise mental health problems. In line with recent recommendations, student voices must be an integral part of service design.

Chapter 5: Are students less likely to respond to routinely delivered psychological treatment? A retrospective cohort analysis.

Publications relating to this chapter

The work in this chapter can be found in the following publication: Barnett, P., Saunders, R., Buckman, J. E., Cardoso, A., Cirkovic, M., Leibowitz, J., ... & Pilling, S. (2022). Are students less likely to respond to routinely delivered psychological treatment? A retrospective cohort analysis. Comprehensive Psychiatry, 119, 152348.

5.1   Introduction

There are mixed findings around whether students have more severe mental health problems than their age matched peers (Tabor et al., 2021), and as described in Chapter 1, many of the demands of young adulthood, regardless of student status may contribute to an increased risk of mental health problems (Duffy et al., 2019; Kessler et al., 2005). However many of the other demands typically placed on students, for example separation from support networks as a result of moving away from home, additional financial burden, potentially increased alcohol and drug use, and academic stress may contribute to heightened risk of these disorders compared to non-students (Blanco et al., 2008; Conley et al., 2014; McCloud & Bann, 2019; Pitt et al., 2018; Prosser et al., 2018; Sheldon et al., 2021). Given that these stressors are also associated with poorer mental health treatment engagement and outcomes (Buckman et al., 2018; Buckman, Saunders, O'Driscoll, et al., 2021; Cruwys et al., 2013), it is unsurprising that psychological distress remains high throughout time in higher education (Bewick et al., 2010).

5.1.1   *The importance of mental health services external to university campuses*

There have been efforts to improve university campus-based mental health services in recent years (Priestley, Broglia, Hughes, & Spanner, 2022; Vallianatos et al., 2019), however, as Chapter 4 demonstrated, a large number of students are seen in psychological therapy services external to student campuses and sometimes consider them as a better option when experiencing crisis (Barnett, Arundell,

Matthews, Saunders, & Pilling, 2021; Eisenberg, Lipson, Ceglarek, Kern, & Phillips, 2018). Use of such services by students is likely to continue given university service waiting times can frequently exceed NHS psychological therapy waiting times, and that there is a limited choice of treatment provided in some campus-based services (Barnett, Arundell, Matthews, et al., 2021; Priestley, Broglia, et al., 2022). Further, it is possible that universities may consider general student wellbeing as their responsibility and as such tailor campus based services to meet this need (GUILDHE, 2018; National Academies of Sciences Engineering and Medicine, 2021), but consider healthcare and illness (including the experience of mental health problems) as the responsibility of external medical services. Consequently, those students experiencing the most severe symptoms may be seen outside of campus-based support. However, it is not clear how well such services meet the needs of students in particular and there has been limited explicit comparison of treatment outcomes in external mental health services between students and non-students. This contrasts with research with explicit focus on the services provided within universities, which have received significantly more scrutiny in recent years (Barnett, Arundell, Matthews, et al., 2021; Priestley, Broglia, et al., 2022), although by their nature the outcomes of university services cannot be compared to non-students. Comparisons within external services may also help to inform service design and provision to make it better tailored to student needs. This is important as students may be more likely to disengage from treatment (Hall et al., 2018), and there are a number of contextual issues specific to the student population such as changes to residence and term-time only availability which may result in poorer outcomes (Broglia et al., 2018).

Within non-campus-based services, similarly-aged adults who are in employment constitute a suitable group to compare to students, as people who are neither in education or employment (those who are NEET) have particularly poor outcomes from treatment services (Buckman, Stott, et al., 2021; O'Dea et al., 2014). For example, findings from previous research which suggest that students may fair better than age-matched peers (Tabor et al., 2021) have not differentiated between employed and unemployed controls, making it hard to establish where on the spectrum of vulnerability university students may sit.

5.1.2 Moderators and predictors of positive outcomes for students

In Chapter 2, the number of sessions provided were predictors of better treatment outcomes in students. External mental health services can vary in the number of sessions provided, unlike campus-based services which are often confined by resource limitations (Gavin, 2021). Such treatment specific variables can have an impact on treatment effectiveness (Saunders, Cape, et al., 2020), but it is also not clear whether students, who may miss some sessions due to aforementioned between-term residence changes are able to attend as many sessions as other young adults, or whether their sessions are provided with less "intensity" (i.e. there are larger waits between sessions) as a result. Waiting time may also impact treatment outcomes (Clark et al., 2018) and for some, preference for either face to face or alternative treatment formats (e.g. telephone or online) can also influence outcomes (Hadler, Bu, Winkler, & Alexander, 2021). Both of these variables may have a particular impact on students when treatment is provided outside the context of a university, for example, waiting time may be longer if a student is referred via their GP, as these primary care services sometimes remain at home rather than in the place of a student's university attendance. It may also be that exam scheduling influences time between referral to treatment and attendance at first assessment. Although format of treatment (online/telephone compared to face-to-face) was not found to predict outcomes in Chapter 2 (see section 2.3.5), outside of the context of a RCT, this is an important moderator to consider, as many NHS psychological services are provided via online/telephone formats (Drew et al., 2021), particularly for low-intensity treatment sessions (Turner, Brown, & Carpenter, 2018), such as those provided to people experiencing mild to moderate symptoms of depression or some anxiety disorders (Clark, 2011).

Other considerations for treatment effectiveness overlap considerably with risk factors for poor mental health generally, and include demographic factors such as those mentioned as risk factors for poor student mental health in Chapter 1 (see section 1.2). Age, socio-economic status and gender have all been shown to predict the efficacy of psychological interventions in adults in some reviews, for example, Cuijpers et al. (2020) reported that interventions for depression may be less effective in children and adolescents than in adults, Haug, Nordgreen, Öst, and Havik (2012)

reported that that being female was negatively associated with the effectiveness of low intensity self-help interventions for anxiety disorders, (although Cuijpers et al. (2014) did not find an association between treatment effectiveness and gender in people with depression), and socio-economic status is also associated with outcomes in NHS psychological services (Clark, 2018). Although these variables are not specific to students, they require careful consideration when investigating how effective a treatment is in a population.

5.1.3 Chapter aims

The aims of this chapter were therefore to 1) explore whether there are differences in characteristics of students and same-age employed adults who were treated in psychological treatment services (i.e. not campus-based care), 2) explore whether there were differences in treatment outcomes between students and same-age employed adults, and 3) to examine potential treatment moderators of outcome.

5.2 Materials and Methods

5.2.1 Services

Patients who attended IAPT services that are part of the "North Central and East London IAPT Service Improvement and Research Network" (NCEL IAPT SIRN) (Saunders, Cape, et al., 2020) formed the dataset for this analysis. IAPT services are part of the NHS and include both primary care and community-based routine mental health services operating across England with over 1.8million referrals annually (NHS Digital, 2022). They deliver evidence-based psychological therapies primarily for depression and anxiety disorders within a stepped-care model, in line with UK national guidelines (Clark, 2018). Within IAPT services, sessional outcome measurement is mandated, which means that pre- and post- intervention data are available for more than 98% of episodes (Clark et al., 2018).

5.2.2 Participants

The initial sample consisted of 483,683 participants who were referred to NCEL services from August 2008 to August 2020. Participants meeting the following criteria were included in the analysis: aged between 17-25 at time of referral, as 70% of

students who enrol in higher education are within this age bracket (HESA, 2021), better allowing for age-matched pairing; had completed treatment, at assessment met the clinical criteria for "caseness" (See Table 5.1) on any depression or anxiety symptom measures used by the services, and reported being either a) a student undertaking full or part-time study who are not working or currently seeking work or b) employed at their initial assessment. Participants were also required to have attended at least two treatment sessions and completed outcome measures at those sessions in order to calculate study outcomes. Two sessions of treatment are considered to be the minimum number for an episode of care to be defined as a 'course of treatment' in these psychological therapy settings (NHS Digital, 2019).

5.2.3 Measures

The measures collected within IAPT services relevant to this study along with relevant thresholds are reported in Table 5.1.

Table 5.1: Measures collected within IAPT services used in this study

Item	Questionnaire	Additional Information/thresholds
Baseline mental health symptoms		
Depressive symptoms	Patient Health Questionnaire 9-item version (PHQ-9; Kroenke, Spitzer, and Williams (2001, 2003))	Scores of 10 or above on the PhQ-9 indicate cases of depression, while a change of 6 or more indicates reliable change.
Anxiety symptoms	The Generalized Anxiety Disorder Scale 7-item version (GAD-7; Spitzer, Kroenke, and Williams (2006)) "Anxiety disorder specific measures" (ADSMs)	Scores of 8 or above on the GAD-7 indicate cases of generalized anxiety while a change of 4 or more indicates reliable change. ADSMs are suggested to be used in place of the GAD-7 if a specific anxiety disorder is identified as the main problem.
	1. *Agoraphobia: Mobility inventory (Chambless, Caputo, Jasin, Gracely, & Williams, 1985)*	Scores of 2.3 and above indicate cases for agoraphobia, while a change of 0.73 indicates reliable change
	2. *Health Anxiety: Health Anxiety inventory (Salkovskis, Rimes, Warwick, & Clark, 2002)*	Scores of 18 and above indicate cases of health anxiety, while a change of 4 indicates reliable change
	3. *Obsessive Compulsive Disorder (OCD): Obsessive Compulsive inventory (Foa, Kozak,*	Scores of 40 and above indicate cases of OCD, while a change of 32 indicates reliable change

	Salkovskis, Coles, & Amir, 1998)	
	4. *Panic Disorder: Panic Disorder Severity Scale (PDSS; Shear et al. (2001))*	There is no threshold for indicating cases or reliable change for the PDSS. Therefore IAPT outcomes for individuals with Panic Disorder are calculated using the GAD-7.
	5. *Post-Traumatic Stress Disorder (PTSD): Impact of events Scale (IES-R; Creamer, Bell, and Failla (2003))*	Scores of 33 and above indicate caseness for PTSD, while a change of 9 indicates reliable change
	6. *Social Anxiety Disorder: Social Phobia Inventory (Connor et al., 2000)*	Scores of 19 and above indicate caseness for social anxiety disorder, while a change of 10 indicates reliable change
Phobic anxiety	IAPT Phobia scales (IAPT, 2011; NHS Digital, 2017))	The phobia scales are three questions which assess the extent that a person avoids situations related to agoraphobia, social phobia and specific phobia.
"Problem descriptor"	Probable or confirmed diagnosis using ICD-10 codes	Used to match participants based on presentation symptoms to evidence-based treatment protocols. Categorised following previous studies (Buckman et al., 2018; Saunders et al., 2021) as depression; mixed anxiety and depression; generalized anxiety disorder; OCD; PTSD; and phobic anxiety or panic.
Functional and Social impairment		
Personal functioning	The Work and Social Adjustment Scale (WSAS; Mundt, Marks, Shear, and Greist (2002))	Measures of functional and social impairment were measured using items 2, 3, 4 and 5 ('home management', 'social activities', 'private leisure activities' and 'close relationships', respectively) of the WSAS. Item 1 ('Ability to work') was not considered in the current analysis as it is routinely scored "N/A" for those not in employment, hence It would have introduced additional bias as many students would likely consider themselves to not currently be in employment/would not be employed outside their studies.
Demographics and other baseline variables		
Demographics	-	The dataset also included gender and age when referred, index of multiple deprivation decile, sexual orientation and ethnicity (using the UK census codes 'White', 'Mixed', 'Asian', 'Black', 'Chinese' and 'other'), all of which were self-reported.

Long-term health conditions	-	Participants also reported whether they had long-term physical health conditions, although the specific nature of reported conditions were not available.
Medication	-	Psychotropic medication use, recorded as prescribed but not taking, prescribed and taking, or not prescribed.
Employment status	-	All participants are asked to report their current employment status. Possible responses included 'Employed', 'Unemployed', 'Student', 'Long-term sick', 'Homemaker', 'Not seeking work', 'Volunteer', 'Retired'. In the current analysis responses of "student" and "employed" only were considered.
Treatment factors		
Number of low and high intensity sessions	-	The number of sessions of each type (High intensity: face-to-face, mainly one-to-one (with some group work) sessions with a suitably trained therapist; low intensity: treatments with less intensive therapist input, e.g. guided self-help or computer-based CBT) received during the course of treatment were recorded
Time to assessment	-	Weeks between referral and first assessment*
Time to treatment	-	Weeks between assessment and the first treatment session*
Length of episode	-	Weeks between assessment and the final treatment session*
Service	-	The mental health service the patient was seen at

* converted to weeks from days and winsorized at the top 99% due to a small number of extreme values

5.2.4 Outcomes

One primary and three secondary dichotomous outcomes were included in the analysis and were defined as follows (Saunders et al., 2021; Saunders, Cape, et al., 2020):

Primary Outcome: Reliable Recovery.

Reliable recovery is used for national evaluations and monitoring of IAPT services (Clark et al., 2018; NHS Digital, 2019) and is defined as transitioning from 'caseness' to 'non-caseness' following treatment, and reporting reliable improvement, as defined below (see Table 5.1 for detail on measures and thresholds).

Secondary Outcomes.

Reliable Improvement.

Reporting a reduction in symptom scores which is more than the reliable change threshold for either the PHQ-9 or GAD-7 (or appropriate anxiety disorder specific measures [ADSM]).

Deterioration.

Reporting an increase in symptom scores which is more than the reliable change threshold for either the PHQ-9 or GAD-7, (or appropriate anxiety disorder specific measures [ADSM]).

Attrition.

Reported as having "dropped out" of the episode of care before completing the agreed number of treatment sessions. Only participants who received at least 3 treatment sessions and were not referred on for further care were included for this outcome (9.6% excluded).

5.2.5 Data Analysis

Sample characteristics and group differences

Students and same-age employed adults meeting inclusion criteria were first compared on baseline and treatment characteristics to establish what differences existed between students and same-age employed adults attending the services. Independent t-tests were conducted to compare differences in means for continuous variables and chi-square tests were conducted to compare categorical variables.

Associations of student status with outcomes

Next, logistic regression models were built to explore the association between student status and outcomes, while controlling for confounders available within the dataset.

For each of the four outcomes listed above, the following models were constructed:

Model 1: The association of student status ("student" vs "employed") with outcomes without additional confounders (i.e. unadjusted)

Model 2: As in Model 1, additionally controlling for treatment-related variables (number of low intensity sessions, number of high intensity sessions, weeks between referral and assessment, weeks between assessment and treatment, and service.)

Model 3: As in Model 2, additionally controlling for baseline symptom and social functioning questionnaire scores (PHQ-9, GAD-7, WSAS2, WSAS3, WSAS4, WSAS5, the three IAPT phobia scale items).

Model 4: As in Model 3, additionally controlling for other demographic and clinical factors (IMD decile, age, gender, sexual orientation, ethnicity, problem descriptor, presence of long-term health conditions, medication prescription).

Missing data.

Missing data on all included continuous variables were imputed using multiple imputations with chained equations (MICE) in Stata 16 (StataCorp, 2019). This method was chosen because it is flexible in handling different types of variables and performs well with large datasets (Azur, Stuart, Frangakis, & Leaf, 2011). Missing categorical variables were not imputed- these were given a "missing" code to allow participants with missing information on these variables to be included in analyses without removal by list-wise deletion, as has been done in previous analyses (Buckman, Stott, et al., 2021; Saunders et al., 2021). Fifty imputed datasets were created and imputed data were used for all regression analyses. Sensitivity analyses were run including only complete data.

Propensity score matching

Propensity score matching (Austin, 2011) was conducted to identify matched students to employed younger adults to establish whether student outcomes differed when individuals were similar on all available confounding variables. Propensity scores can be understood as the probability of being assigned to a given group taking into account baseline characteristics (Austin, 2011). Model 4 was then

replicated using this sample for each outcome. Matching was performed on all variables planned to be entered into the regression models, using "psmatch2" (Leuven & Sianesi, 2003) in Stata. Only cases which had complete data for continuous variables were included, however missing categorical data was coded as "missing" as described above. The caliper (a control on the quality of matches- the propensity score between the student and their matching control must be less than or equal to the specified caliper (Sianesi, 2001)) was set at 0.001 as in previous analyses of this dataset as this has been established as an acceptable level for matching (Saunders et al., 2021). The first nearest neighbour was identified for each student, meaning the same control case could be identified as the best match for two different student cases, also following previous methods using these types of data (Saunders, Buckman, & Pilling, 2020; Saunders et al., 2021). Cases were weighted according to the number of matches in the analysis.

Treatment moderators

The following moderators were examined:

Main treatment intensity.

IAPT services provide both high intensity and low intensity treatments (Clark, 2018). Patients with mild to moderate depression and some anxiety disorders receive low intensity treatment, such as guided self-help and computerized CBT) while patients with moderate to severe depression or other anxiety disorders, as well as those not responding to low intensity treatments are offered high intensity therapy (face-to-face CBT or interpersonal therapy). As a result, it was important to explore whether students may be more likely to be provided with mainly low or high intensity sessions than other age-matched adults, as this could be a moderator of any identified association with treatment outcomes. In the analysis, main treatment intensity was defined as "high intensity" for individuals where the number of high intensity sessions were more than two and the number of low intensity sessions was less than two, and defined as "low intensity" when the number of low intensity sessions were more than two and the number of high intensity sessions were less than two. Participants whose sessions did not meet either of these criteria were excluded from the moderation analysis, as these individuals may have received a range of treatments.

Main treatment medium.

Similarly, treatment medium was explored as a moderator to identify if associations may be moderated by tendencies for students to opt for specific formats over others. Treatment medium was defined as "face to face" if more than half of the total treatment sessions were provided face to face, and "other" if more than half of the total treatment sessions were provided via other formats (this was usually via telephone but in some instances, particularly for those that received high intensity therapy in 2020, was via video–call (Buckman, Saunders, Leibowitz, & Minton, 2021)).

Treatment rate.

Treatment rate was calculated as the average number of sessions per week. This was calculated by dividing the number of treatment sessions by the length of the treatment episode in weeks.

Interaction terms were fitted in fully adjusted models (Model 4) to explore the effects of moderators. Imputed data were used, and sensitivity analyses were also conducted including only complete data. Models exploring the interaction of main treatment intensity and student status were adjusted for the number of sessions in total (instead of the number of high intensity and low intensity sessions separately). Since treatment rate is likely to differ significantly between those who received mainly high intensity sessions and those who received mainly low intensity sessions, analyses were conducted separately for these two groups, and participants whose sessions did not meet criteria for either mainly high intensity or mainly low intensity (29.6%) were excluded from the analysis. In this analysis, students who received less than 4 sessions were also excluded (a further 9.6% of those remaining) in order to create a treatment rate variable that accurately reflected frequency of sessions without being skewed by those who were assessed and subsequently dropped out.

5.3 Results

5.3.1 Baseline differences between students and same-age employed adults

Of 19,707 participants meeting inclusion criteria, 6,969 (35.4%) were students aged between 17-25 years old. A participant flow diagram is presented in Figure 5.1. Table 5.2 presents comparisons of baseline and treatment characteristics.
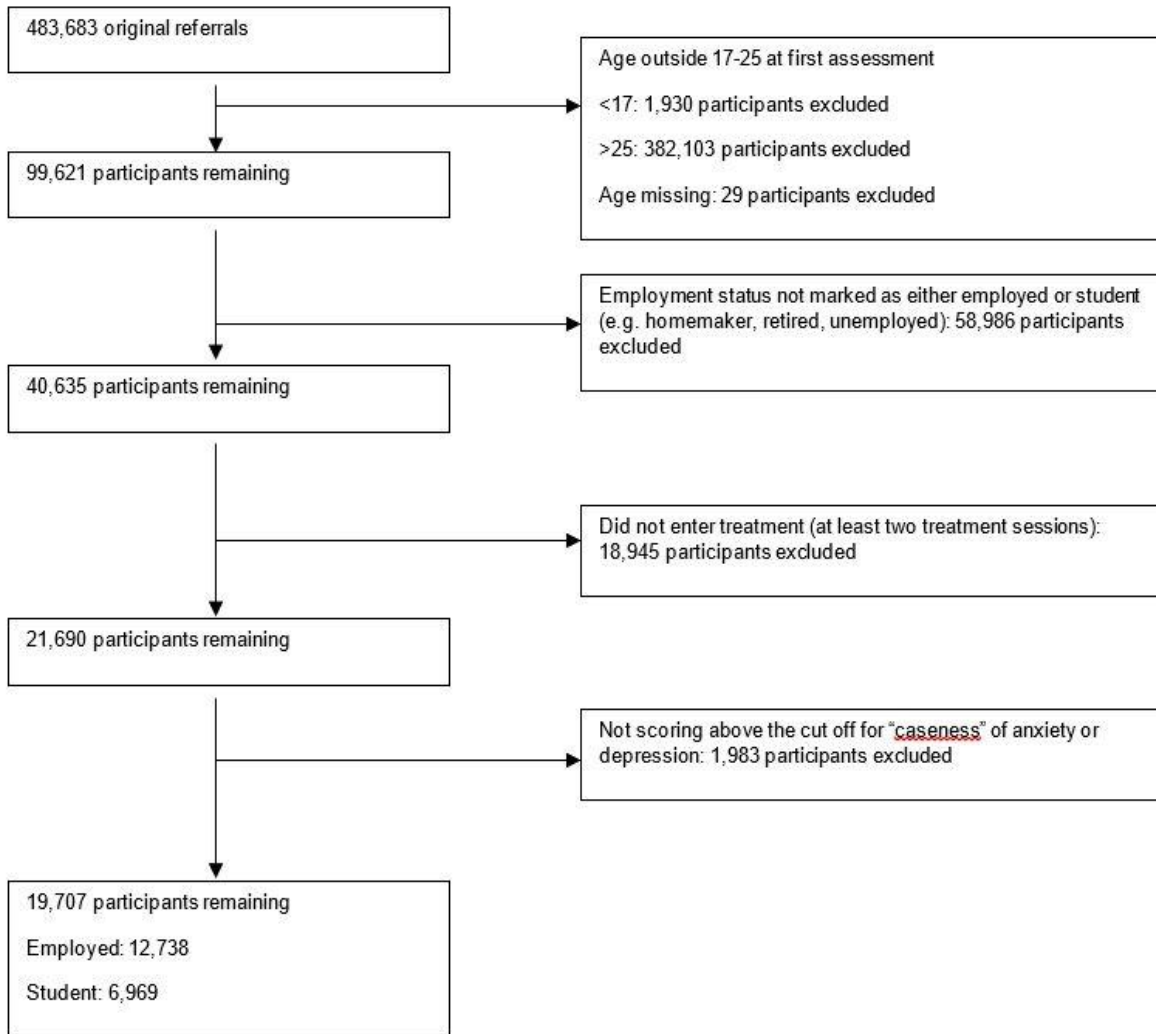
Figure 5.1: Participant flow diagram

Table 5.2: Baseline differences between students and employed adults aged 17-25

		Students			Employed			
		n	M	SD	n	M	SD	t	p
PHQ-9		6,968	15.11	5.25	12,738	14.49	5.35	7.87	<.001
GAD-7		6,967	13.61	4.27	12,736	13.86	4.24	-3.95	<.001
WSAS-item 2		5,785	3.38	2.32	10,999	3.44	2.32	1.06	.291
WSAS-item 3		5,785	4.38	2.62	10,999	4.24	2.25	3.84	<.001
WSAS-item 4		5,783	3.55	2.42	10,996	3.48	2.46	1.79	.074
WSAS-item 5		5,785	4.15	2.36	10,995	4.16	2.38	-0.10	.919
Agoraphobia item		6,873	2.85	2.59	12,548	2.63	2.57	5.57	<.001
Social phobia item		6,872	3.44	2.42	12,557	3.07	2.39	10.22	<.001
Specific phobia item		6,872	2.29	2.55	12,551	2.03	2.50	6.80	<.001
Number LI sessions		6,969	2.70	2.63	12,738	2.80	2.62	-2.66	.008
Number HI sessions		6,969	4.56	5.31	12,738	4.75	5.49	-2.32	.020
Weeks - referral to assessment		6,964	3.46	3.36	12,734	3.35	3.48	2.04	.041
Weeks - assessment to treatment		6,540	7.94	7.83	11,963	8.63	8.30	-5.65	<.001
Age		6,969	20.72	2.21	12,738	22.98	1.91	-71.75	<.001

		Students		Employed			
		N	%	N	%	X²	p
Gender	Male	1,818	26.1	3,433	27.0	1.73	.192
	Female	5,102	73.2	9,218	72.4		
	Missing	49	0.7	87	0.7		
Ethnicity	White	3,577	51.3	8,317	65.3	489.73	<.001
	Mixed	587	8.4	950	7.5		
	Asian	1,127	16.2	1,179	9.3		
	Black	796	11.4	1,243	9.8		
	Chinese	149	2.1	94	0.7		
	Other	288	4.1	273	2.1		
	Missing	445	6.4	682	5.4		
IMD decile	1	586	8.4	1,097	8.6	34.89	<.001
	2	1,800	25.8	3,422	26.9		
	3	1,464	21.0	2,694	21.2		
	4	872	12.5	1,621	12.7		
	5	772	11.1	1,128	8.9		
	6	538	7.7	1,007	7.9		
	7	349	5.0	610	4.8		
	8	269	3.9	599	4.7		
	9	129	1.9	235	1.8		
	10	49	0.7	98	0.8		
	Missing	141	2.0	227	1.8		
Sexual orientation	Heterosexual	4,508	64.69	8,209	64.4	19.46	<.001
	Gay/Lesbian	218	3.13	377	3.0		
	Bi-sexual	371	5.32	523	4.1		
	Missing	1,872	26.86	3,629	28.5		
Medication	Prescribed - not taking	603	8.7	916	7.2	21.95	<.001
	Prescribed and taking	2,094	30.1	3,709	29.1		
	Not prescribed	3,931	56.4	7,378	57.9		
	Missing	341	4.9	735	5.8		
Long term condition	No	4782	68.6	8,652	67.9	5.43	.066

	Yes	958	13.8	1,677	13.2		
	Missing	1,229	17.6	2,409	18.9		
Problem descriptor	Depression	2,314	33.2	4,388	34.5	71.61	<.001
	Mixed A.D.	326	4.7	646	5.1		
	GAD	929	13.3	2,006	15.8		
	OCD	213	3.1	312	2.5		
	PTSD	151	2.2	277	2.2		
	Other phobia and panic	330	4.7	767	6.0		
	Social phobia	381	5.5	598	4.7		
	Unspecified anxiety	268	3.9	481	3.8		
	Missing	2,057	29.5	3,263	25.6		
Clinical outcomes recorded	Reliable recovery	2,920	41.9	6,086	47.8	62.73	<.001
	Reliable improvement	4,678	67.1	9,138	71.7	45.72	<.001
	Deterioration	501	7.2	840	6.6	2.51	.113
	Drop-out	2,141	34.3	3,770	32.6	4.91	.027

Note. WSAS: Work and social adjustment scale items. LI: low intensity HI: high intensity IMD: index of multiple deprivation

Students had higher scores on measures of depression (p<.001), but lower scores on measures of anxiety at baseline (p<.001). They also had higher scores on the measures for specific phobia (p<.001) and social phobia (p<.001) but lower agoraphobia scores (p<.001). However, fewer students had depression or generalized anxiety as their recorded problem descriptor (diagnosis), with more OCD and phobias recorded. Students also reported more impairment in social leisure activities (p<.001), although other WSAS scale item scores did not appear to differ between students and non-students. Mean numbers of both low intensity and high intensity sessions were lower in students (p=.008 & p=.020, respectively) and they experienced elevated waiting times from referral to assessment (p=.041). However, they experienced reduced waiting times from assessment to treatment (p<.001). Although the cohort included more females than males, the balance was similar between students and employed adults (p=.192), as was the presence of long-term health conditions (p=.066). The sample was limited to ages 17-25, but the mean age of students was lower than that of employed adults (p<.001). There were significant differences in ethnicity between the two groups (p<.001); the student group encompassed more ethnic minority participants compared to the employed group, although in both the majority of participants described their ethnicity as 'White'.

The percentages of students and employed adults who experienced reliable recovery, reliable improvement, deterioration and attrition are also shown in Table 5.2. Overall, fewer students reliably recovered (41.9% vs 47.8%; p<.001) and reliably improved (67.1% vs 71.7%; p<.001), and more students dropped out (34.3% vs 32.6%; p=.027). Similar proportions of students and non-students reliably deteriorated (7.2% vs 6.6%; p=.113).

5.3.2 The association of student status with clinical outcomes

Table 5.3 shows the results of logistic regression models exploring associations between student status and outcomes. After adjusting for number of sessions attended, waiting times and the service attended, students (vs employed) were less likely to reliably recover (OR=0.82, 95% CI: 0.76-0.86) and reliably improve (OR=0.83, 95% CI: 0.78-0.89). Attrition was more likely in students (OR=1.12, 95% CI: 1.04-1.21) but there was no evidence of a difference in the odds of deterioration (OR=1.07, 95% CI: 0.95-1.20). After also controlling for baseline severity, students continued to be less likely to reliably recover (OR=0.85, 95% CI: 0.80-0.90) and reliably improve (OR=0.85, 95% CI: 0.80-0.91), though the association between student status and attrition was no longer significant (OR=1.07, 95% CI: 0.99-1.16). Controlling for all service level, baseline symptom and demographic variables, students were less likely to reliably recover (OR= 0.90, 0.83-0.96) and reliably improve (OR= 0.91, 95% CI: 0.84-0.98). There remained no evidence that students were more likely to deteriorate (OR= 0.89, 95% CI: 0.78-1.02) or drop out (OR= 1.01, 95% CI: 0.93-1.11) than same-age employed adults. Sensitivity analyses conducted on complete cases only showed similar results (Appendix 5.1).

Table 5.3: Logistic regression models of the association between student status and outcomes

		Reliable Recovery	Reliable Improvement	Deterioration	Attrition
Model 1	Student	0.78 (0.74-0.84)	0.80 (0.76-0.86)	1.10 (0.98-1.23)	1.08 (1.01-1.15)
Model 2	+ Service level variables *	0.82 (0.76-0.86)	0.83 (0.78-0.89)	1.07 (0.95-1.20)	1.12 (1.04-1.21)
Model 3	+ Baseline severity ‡	0.85 (0.80-0.90)	0.85 (0.80-0.91)	1.03 (0.91-1.16)	1.07 (0.99-1.16)
Model 4	+ Demographic factors §	0.90 (0.83-0.96)	0.91 (0.84-0.98)	0.89 (0.78-1.02)	1.01 (0.93-1.11)
Model 4 matched	Matched controls. ẟ	0.87 (0.80-0.94)	0.85 (0.78-0.93)	0.88 (0.75-1.03)	0.96 (0.86-1.06)

* Number low intensity sessions, number high intensity sessions, weeks between referral and assessment, weeks between assessment and treatment, trust.
‡PHQ9, GAD7, Work and Social Adjustment Scale items 2-5, phobias
§ Index of multiple deprivation, age, gender, ethnicity, diagnosis, long term conditions, medication use, sexual orientation.
ẟ N=10,640 for reliable recovery, reliable improvement and deterioration. N=9789 for attrition

5.3.3 Matching

Propensity score matching was performed including all baseline variables. Acceptable matches were not found for 93 students. Once these cases were excluded, 5320 students and matched non-student controls were included in the analyses. Comparisons of baseline characteristics between students and their matched controls were conducted and are shown in Appendix 5.2. Good balance was achieved, with small but significant differences found only for age and ethnicity. Results of the regression analysis using this sample were conducted on complete cases only and are also displayed in Table 5.3. After matching, students were less likely to reliably recover (OR=0.87, 95% CI: 0.80-0.94) and reliably improve (OR=0.85, 95% CI: 0.78-0.93), and there was no evidence of differences in the odds of deterioration (OR=0.88, 95% CI: 0.75-1.03) or attrition (OR=0.96, 95% CI: 0.86-1.06).

5.3.4 Moderators of outcomes

There was no evidence that the main intensity of treatment received, or the main modality of treatment (face to face or telephone) moderated the effect of student status on outcomes (e.g. for reliable recovery, p=.088 and p=.745, respectively; see

Table 5.4 for results using imputed data and Appendix 5.3 for sensitivity analyses using complete cases only).

Table 5.4: Associations between each outcome and student status moderated by treatment intensity and modality in fully adjusted models* (Imputed data)

Interaction	Reliable Recovery	Reliable Improvement	Reliable Deterioration	Attrition
Student by main intensity (high intensity) ‡	0.88 (0.76-1.02)	0.92 (0.78-1.09)	0.83 (0.62-1.13)	1.19 (0.98-1.44)
Student by main modality (face to face) §	0.97 (0.83-1.14)	0.92 (0.78-1.09)	1.07 (0.78-1.47)	0.99 (0.82-1.19)

*All models adjusted for number of sessions, weeks from referral to assessment, weeks from assessment to treatment, service, PHQ-9 scores, GAD-7 scores, Work and Social Adjustment Scale item 2-5 scores, IAPT phobias scale item scores, IMD, age, gender, ethnicity, diagnosis, long term conditions, medication use, and sexual orientation
‡ N= 13,489 for reliable recovery, reliable improvement and deterioration. N=12,607 for attrition.
§ N= 17,411 for reliable recovery, reliable improvement and deterioration. N=16,105 for attrition.
Note. IAPT: Improving Access to Psychological Therapies. IMD: Index of Multiple Deprivation.

There was also no evidence that treatment rate moderated outcomes of reliable recovery, reliable improvement or deterioration. However, in the mainly high intensity sub-group, treatment rate significantly moderated the effect of student status on attrition, such that students experienced less improvement in the likelihood of attrition with increasing frequency of sessions compared to employed adults. In the mainly low intensity subgroup treatment rate did not moderate attrition. Table 5.5 and Figure 5.2 shows results using imputed data and Appendix 5.4 shows sensitivity analyses using complete cases only.

Table 5.5: Associations between each outcome and student status moderated by treatment rate fully adjusted models*, by main intensity type (Imputed data)

Interaction	Reliable Recovery	Reliable Improvement	Reliable Deterioration	Attrition
Student by treatment rate (Mainly high intensity sub-group) ‡	0.74 (0.46-1.19)	1.24 (0.72-2.14)	0.44 (0.15-1.30)	2.12 (1.11-4.03)
Student by treatment rate (Mainly low intensity sub-group) §	0.84 (0.50-1.40)	0.99 (0.56-1.78)	1.08 (0.35-3.33)	0.64 (0.34-1.21)

*All models adjusted weeks from referral to assessment, weeks from assessment to treatment, service, PHQ-9 scores, GAD-7 scores, WSAS items 2-5 scores, IAPT phobias scale item scores, IMD, age, gender, ethnicity, diagnosis, long term conditions, medication use, and sexual orientation
‡ N= 6930 for reliable recovery, reliable improvement and deterioration. N=6560 for attrition.
§ N= 5317 for reliable recovery, reliable improvement and deterioration. N=4977 for attrition.
Note. IAPT: Improving Access to Psychological Therapies. IMD: Index of Multiple Deprivation.
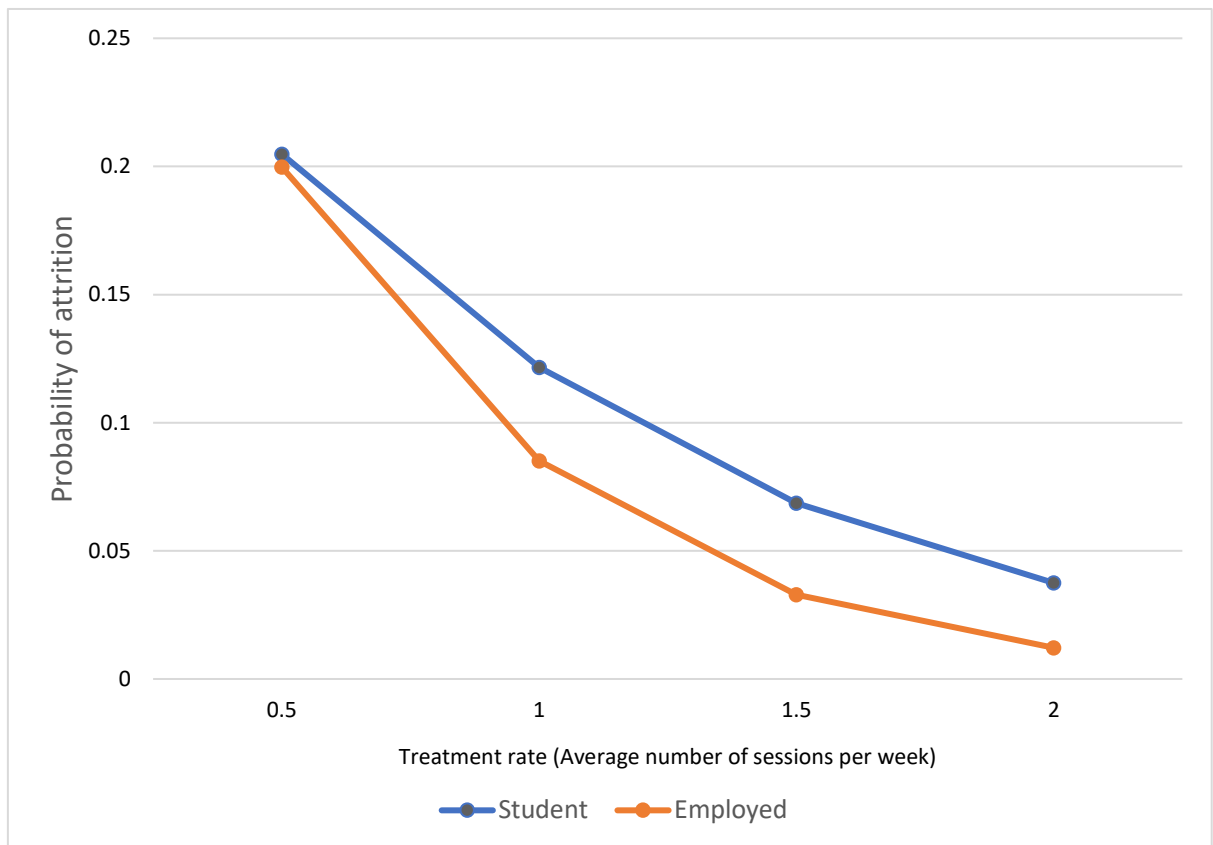
Figure 5.2: Moderation of the association between student status and attrition in those receiving mainly high intensity treatments by treatment rate

5.4 Discussion

This chapter aimed to explore the differences in outcomes between university students aged 17-25 and employed people of the same age receiving therapy from IAPT services. Students had reduced odds of experiencing positive outcomes such as reliable recovery or reliable improvement, but were equally as likely to experience a reliable deterioration or to drop out of treatment compared to employed controls. These findings were similar across the whole sample and when analysing a propensity-score matched sample, and were not moderated by treatment specific variables such as waiting times, intensity, frequency or medium of treatment, suggesting a good degree of robustness to the findings.

Previous research has suggested that reports of poor student mental health may be the product of factors relating to emerging adulthood (Conley et al., 2014; Tabor et al., 2021). However, the results of this analysis suggest that in considering treatment

outcomes, age is not a key factor in determining poor outcomes in students; even when controlling for age, students are less likely to have positive treatment outcomes compared to their non-student peers. One possible explanation is that a factor unmeasured within the current dataset relevant to the context of being a student reduces the effectiveness of psychological treatment. For example, many have argued that a lack of strong social support is particularly common in university students (Conley et al., 2014) due to the requirement to form new relationships, in new social settings when attending university away from home (Wood et al., 2018), which combined with increasing academic demands can mean that some students fail to form a new social support network (Conley et al., 2014). This has been linked to poor mental health outcomes in this population (Sheldon et al., 2021). Although measures of social functioning were controlled for within the analysis, it is likely that this does not capture in totality the impact of the social dislocation inherent in moving away from home to attend higher education. A second possibility is that disruptions to IAPT treatment may occur for students during holiday or exam periods- students had significantly fewer treatment sessions compared to non-students and this is an established factor impacting treatment outcomes in IAPT (Saunders, Cape, et al., 2020). However, adjusting for the number of high and low intensity sessions received did not impact on results, and treatment rate (which would be lower for large episodes of absence during holidays) showed limited impact here.

It has been suggested that students are more likely to drop out of interventions (Hall et al., 2018), but this was not supported by the current study. As Chapter 4 demonstrated, students want more, rather than less treatment (Barnett, Arundell, Matthews, et al., 2021), and this may particularly impact attrition in those students who seek additional support external to university services. Of note, in those receiving predominantly high intensity care, students may not experience a reduced likelihood of attrition with higher session frequency to the extent that employed adults do.

The results of this study suggest that it may be important to consider adapting care pathways and the content of interventions to meet student-specific needs both within campus-based services and external services. In line with recent calls for the integration of local external mental health services with university-based services,

and for all services and communications about these services to be adapted so that they are made relevant for students (Broglia et al., 2022), such an approach may contribute to improved outcomes for students being seen within psychological therapy services. For example, services might offer additional support for highly prevalent co-occurring stressors such as academic/exam stress (Pitt et al., 2018; Sheldon et al., 2021), financial stress (McCloud & Bann, 2019) and lack of social support (Buckman, Saunders, O'Driscoll, et al., 2021; Conley et al., 2014; Pitt et al., 2018) to combat potential barriers to recovery. Where guidance on adaptation exists (e.g. for alcohol and substance use; Buckman et al. (2018)), further consideration of how to make such support more accessible to students may be required. Social support in particular is often relied upon by young people when seeking support for mental health problems (Quinn et al., 2009), see also Chapter 3, and therefore integrating this could boost effects of both university-based and external mental health care. Moreover, similarly to specific staff training for children and young people (Fonagy, Pugh, & O'Herlihy, 2017), it is likely that staff working in mental health services would welcome additional training in supporting students, particularly given that there is an association between the proportion of experienced staff and positive outcome (Gyani, Shafran, Layard, & Clark, 2013).

5.4.1 Limitations

In considering the results of this study, some important limitations should be considered. Students and their same aged employed peers were selected from the dataset using a self-report employment variable, which was worded so that the "student" response required the student to be not working or seeking employment. As there is only one response allowed on this question, an important group of students who work alongside their studies and have identified as employed may have been missed. This is most likely among students who study part-time, particularly common among post-graduate students, who arguably may have more stressors such as additional work and family commitments alongside study (Van Der Heijde et al., 2019). Although this makes our estimates conservative as the effect may have been weakened by comparison to a group which may contain some of these students, consideration of post-graduate and part-time students is important for future work, as mental health problems are highly prevalent in this population (G.

A. Nagy et al., 2019). Similarly, the dataset is also limited by the lack of contextual information regarding academic or other higher education factors, which prevents definitive examination of the hypothesis that these may influence outcomes. Future research should look to explore the association between such factors and treatment outcomes in students.

In addition, although all available confounding factors were adjusted for and propensity score matching was used as an alternative way to deal with confounding, residual confounding by factors unable to be adjusted for here cannot be ruled out, for example the age of initial onset of mental health problems (Kessler et al., 2005), which future research should aim to explore further. Propensity score matching also did not remove baseline differences in ethnicity and age between students and employed adults. The sample was limited to those aged between 17-25 years old, but there could be some differences in responses to treatment at different ages within this group. A recent systematic review and individual patient data meta-analysis has however found that age is not associated with treatment outcomes for adults with depression treated in primary care (Buckman, Saunders, Stott, et al., 2021). Students from minority ethnic groups could be considered particularly at risk of poor mental health outcomes (Eisenberg et al., 2013), and as such this may have contributed to the poorer outcomes in the student group. Controlling for age and ethnicity did not remove the association of student status and recovery or improvement, however, supporting the assertion that there is something inherent in being a university student which is associated with poorer odds of recovery post-treatment.

Finally, the results of these analyses included only those IAPT services included in the NCEL IAPT SIRN network. Although all IAPT services submit data monthly to NHS digital where it is compiled for national reports on IAPT service performance, access requests to NHS digital incur large costs and can take considerable time to be granted. Further, although it is possible that generalisability of findings would have been greater if additional services were included via use of the national dataset, use of a smaller dataset provided the possibility of discussing findings and potential implications directly with the local services who contributed data via the

NCEL network. It was therefore decided that the use of the national dataset was not feasible for this project.

5.4.2 Conclusions

Overall, this chapter demonstrates that students have significantly poorer outcomes than their age-matched peers when attending external mental health services, calling into question arguments that poor mental health in this population is a result of age rather than context. It is therefore possible that additional support to combat the negative impact of student specific stressors is required not only within university-based services, but also when linking with external services to ensure that the beneficial effects of coordination of care are not overshadowed by poorer treatment outcomes.

Chapter 6: Trajectories of change in social functioning and associations with treatment outcome in university students receiving routinely delivered psychological treatment: A growth mixture model analysis

The work in the chapter can be found in the following publication: Barnett, P., Saunders, R., Buckman, J., Naqvi, S., Singh, S., Stott, J., . . . Pilling, S. (2023). The association between trajectories of change in social functioning and psychological treatment outcome in university students: A growth mixture model analysis. Psychological Medicine, 1-11. doi:10.1017/S0033291723000363

6.1   Introduction

In Chapter 5, students were shown to have reduced likelihood of experiencing positive outcomes following psychological therapy compared to same-age employed adults. This suggests that students may not benefit as much from standard psychological treatments as delivered in routine settings such as NHS IAPT services, which might suggest a need for additional or adapted treatment or support. A number of researchers have argued that the displacement and loss of social support experienced by students when they begin their studies at university is a key risk factor for the onset of mental health disorders (Bewick et al., 2010; Conley et al., 2014; Conley, Shapiro, Huguenel, & Kirsch, 2020). Similarly, evidence suggests that stressors relating to relationships, including with family and peers are the most commonly reported source of stress among students (Hurst, Baranik, & Daniel, 2013). However, what is less clear is whether such social stressors are particularly inhibitive for students when receiving mental health treatments, and whether a reduction in the impact of these stressors through improved social functioning is associated with improved treatment outcomes.

6.1.1   *The role of social support in mental health and wellbeing*

People who are lonely (experiencing a feeling that their social needs are not being met; (Culbreth, Barch, & Moran, 2021; Hawkley & Cacioppo, 2010)) have reported to be significantly more likely to experience depression compared to people who are

not lonely (Cacioppo et al., 2006; Hawkley & Cacioppo, 2010). In fact, lack of social contact, whether perceived (loneliness) or objective (social isolation), has been reported to be higher in people with a number of mental health disorders, including schizophrenia, anxiety, increased risk of suicide, poor executive functioning and dementia (Hawkley & Cacioppo, 2010) alongside depression. Similar associations have also been shown in students with research suggesting that low levels of social support are associated with higher levels of depressive symptoms (Alsubaie, Stain, Webster, & Wadman, 2019), and that higher student-rated relationship quality and the extent of personal interests are negatively associated with anxiety (Nola et al., 2021). Social support is also considered important for adjustment to university, and is related to academic success and self-esteem (Conley et al., 2020). Furthermore, a previous chapter (Chapter 3) demonstrated that friends and family are a key source of support when experiencing mental health symptoms and may encourage help-seeking when required. However, a reverse causal relationship has also been argued for with social isolation being a consequence of mental health problems ((Cacioppo et al., 2006; Diehl, Jansen, Ishchanova, & Hilger-Kolb, 2018)). For example, the Diagnostic and Statistical Manual for mental disorders (DSM-V) diagnostic criteria for major depression includes impairment in social functioning (American Psychiatric Association, 2013), which is highly associated with loneliness and social isolation (Culbreth et al., 2021; Diehl et al., 2018; Saris, Aghajani, Van Der Werff, Van Der Wee, & Penninx, 2017). Research which has attempted to understand the direction of effects also indicates that relationship conflict predicts psychological distress in emerging adults (Özdemir & Sağkal, 2021), and loneliness can predict subsequent changes in depressive symptoms in middle-aged adults, but not vice versa (Cacioppo, Hawkley, & Thisted, 2010; Hawkley & Cacioppo, 2010). This suggests that changes in feelings of loneliness and social isolation, as well as broader social functioning, could be a key influence on changes in mental health.

Given that social functioning can differ quite substantially within student populations (Diehl et al., 2018; Jobe & White, 2007), an additional important finding is that social functioning is associated with outcomes of mental health treatment. Wang (2019) found evidence in a systematic review that self-perceived social support before treatment was predictive of recovery at follow up in people with depression, and some evidence also supported a similar relationship in people with anxiety and

bipolar disorder. It is possible that this relationship could be stronger among students who value informal contacts as sources of support when experiencing stress and mental health symptoms (see Chapter 3), and variations in the extent to which university mental health support takes social functioning into account may explain variation in intervention effectiveness in student populations (Barnett, Arundell, Saunders, et al., 2021).

The close relationship between social functioning and mental health symptoms indicates that those with poor social functioning at baseline are the least likely to recover (Wang, Mann, Lloyd-Evans, Ma, & Johnson, 2018). However, while this shows that those with poor social support when entering treatment may need more intensive interventions, it is less clear whether people who report improvements in social aspects of their lives during the course of treatment are more likely to recover than those who do not experience these improvements. Given the large emphasis on university as a time of self-development and cultivation of friendships (Conley et al., 2014; Conley et al., 2020), it is possible that improvements in social functioning could act as a key driver for subsequent improvement in mental health for students, as reductions in the distress that accompanies impairments in social functioning (Hurst et al., 2013) may enable students to focus on social roles and other developmental challenges of early adult life. Similarly, students who experience a decline in social functioning during the course of treatment may experience a concurrent decline in their mental health (Hawkley & Cacioppo, 2010). This suggests that students may benefit from treatment which has an explicit focus on such roles.

6.1.2 Work and Social Adjustment Scale

Measures of social functioning are collected during each session in IAPT services using the work and social adjustment scale (WSAS; (Mundt, Marks, Shear, & Greist, 2002)). The WSAS is a self-report scale of functional impairment attributable to an identified problem (Marks, 1986; Mundt et al., 2002), and has been used frequently to study the effects of anxiety and depression treatment (See Appendix 6.1 for the full scale and response options). The session-by-session measurement of social and personal functioning using the WSAS provides the opportunity to explore change in social functioning and its associations with outcome. Exploration of some of the

specific items of the WSAS, such as those relating to socialising with others, could act as an indication of how mental health problems inhibit social activities commonly involved in university life (i.e., forming new close relationships with fellow students and participating in social activities with them). While controlling for the WSAS at baseline did not remove the association between student status and worse outcomes compared to same-age employed adults (see Chapter 5), it is possible that exploration of how students improve on these measures on a session-by-session basis could give an indication of how social functioning can facilitate (or inhibit) treatment gains (Lutz, 2002; Lutz, Böhnke, & Köck, 2011).

6.1.3 Identifying trajectories of change in psychotherapy

Longitudinal structural equation modelling approaches can be used to examine trajectories of change during treatment. One of the most popular approaches is latent growth curve modelling (LGC; (Bollen & Curran, 2006; Preacher, Wichman, MacCallum, & Briggs, 2008)), which describes the average trajectory of change for a sample of individuals who have data at multiple timepoints. Techniques such as this could allow an understanding of how students may experience changes in social functioning across time. This has been used in a recent examination of student social adjustment through four years of university attendance (Conley et al., 2020), with findings showing that self-rated social support from friends (an item from the Social Support Appraisals Scale (Vaux et al., 1986)) decreased throughout the first two years and then tended to increase gradually in the final two years, while measures of psychological distress increased over the first two years before slightly decreasing and then levelling off during the third and fourth years. In another study (Kroshus, Hawrilenko, & Browning, 2021), LGCs were used to model the trajectory of change in depression and anxiety across the transition to university, finding that symptoms increased across the transition before levelling off the following summer, although authors also reported that there was significant variation in symptoms reported within the sample. This highlights a significant limitation of LGC's: this method cannot differentiate distinct sub-populations within the sample, as it provides only one average trajectory alongside an estimate of the overall variance within the sample (Mara & Carle, 2021; Ram & Grimm, 2009). By only providing an average trajectory, the opportunity to explain this variance within the sample by identifying

groups of students who may differ substantially from one another is lost (Berlin, Ankney, & Rybak, 2018; Mara & Carle, 2021).

Alternative approaches which are able to identify groups of students with different trajectories of change are growth mixture modelling (GMM; (B. Muthén, 2001; B. Muthén & Muthén, 2000; B. Muthén & Shedden, 1999)) and Latent Class Growth Analyses (LCGA, (Nagin, 1999)), the latter forming a more restrictive sub-type of GMM. These methods differentiate between different patterns of change in a population over time through the identification of unobserved (latent) sub-populations, or classes. Such approaches have often been described as "person centred" approaches (Berlin et al., 2018; Berlin, Williams, & Parra, 2014; S. K. Johnson, 2021; B. Muthén & Muthén, 2000) as they allow the variation in change over time to be uncovered (Mara & Carle, 2021). Through these approaches, individuals are assigned to a latent categorical variable which designates unobserved sub-groups of people based on similar patterns in longitudinal data (Berlin, Williams, et al., 2014; T. Jung & Wickrama, 2008). Such sub-groups may experience treatment differently or may be more or less likely to experience positive treatment outcomes. These approaches could also aid clinicians in understanding which patients are in need of additional intervention by identifying those with trajectories of decline in symptoms (Saunders et al., 2019).

6.1.4 Chapter aims

The aim of this chapter was therefore to explore the change in measures of social functioning (i.e., the effect of mental health on social leisure activities (WSAS item 3) and close relationships (WSAS item 5)) of students who were treated in IAPT services. GMM was used to establish if there were different classes of patients who followed different trajectories of social functioning change during IAPT treatment. A second aim of this chapter was to explore whether identified trajectory classes differed regarding eventual treatment outcome.

6.2 Method

6.2.1 Sample

This analysis used a sub-sample of the sample described in Chapter 5, consisting of patients attending services who were part of the NCEL IAPT SIRN (Saunders, Cape, et al., 2020) between August 2008 and August 2020. As in Chapter 5, participants were excluded if they were aged below 17 or above 25 (384,033 participants with age outside this range, and 29 participants with missing age data excluded), however for the current analysis only those reporting being a student at their initial assessment were included (84,730 participants excluded). Participants were also excluded from the analysis if they did not enter treatment or did not have data recorded at a minimum of three time points (8,211 participants excluded). This is because GMM requires a least three observations in order to model trajectories of change. As in Chapter 5, those not scoring above the cut off for "caseness" of anxiety or depression were also excluded (576 participants excluded), and a further 883 participants were excluded because they did not have individual scores for each WSAS item recorded (only total scores were recorded for a small group of participants in the dataset). As a result, the final sample consisted of 5,221 students. A flow diagram of participant inclusion is displayed in Figure 6.1.
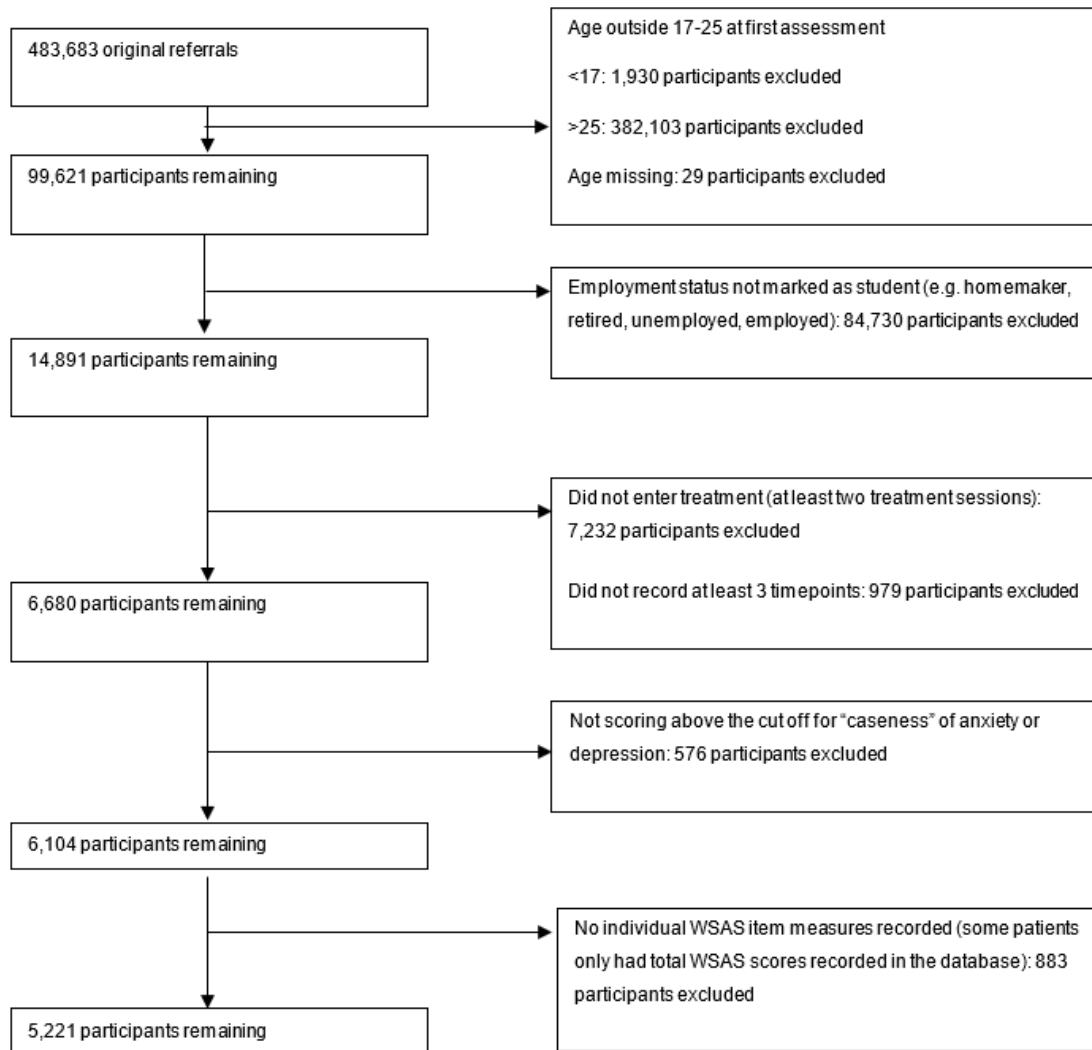
Figure 6.1: Flow diagram of participant inclusion

 Students were included in the analysis regardless of the intensity of treatment received. This was considered appropriate as previous analyses (see Chapter 5) indicated that treatment intensity does not impact outcomes in students.

6.2.2 Measures

IAPT services are mandated to collect outcome measures at each session (Saunders et al., 2019). This analysis used this sessional recording of items from the WSAS. The WSAS total score constitutes a measure of overall functional impairment, including in employment, home management, social leisure activities, private leisure activities, and close relationships, however the "employment" item is not scored for people who are not working, making the total score a less useful

measure in exploring social functioning in students. WSAS-3 (social leisure activities) and WSAS-5 (close relationships) were therefore the focus of this analysis, as they were deemed the most relevant for indicating impairment in the social aspects of university life. Both items were self-rated on a scale of 0-8, with 0 representing no impairment and 8 representing severe impairment.

Social leisure activities

The third item of the WSAS scale asks patients to rate how much their mental health problem impairs their social leisure activities (with other people, such as parties, bars, clubs, outings, visits, dating and home entertaining).

Close relationships

The fifth item of the WSAS scale asks patients to rate how much their mental health problem impairs their ability to form and maintain close relationships with others, including those they live with.

Additional measures

Remaining measures used in the analysis were baseline measures of mental health symptoms (depressive symptoms, anxiety symptoms, phobic anxiety, probable or confirmed diagnosis), demographic and other baseline variables (gender, age, IMD, sexual orientation, ethnicity, long term health conditions and psychotropic medication use) and treatment factors (number of high and low intensity sessions received, time to assessment, time to treatment and service seen at). For a full description of additional measures, scales used and their definitions see Chapter 5, Table 5.1.

Outcomes

As with previous analyses (see Chapter 5), eventual treatment outcomes were reliable recovery, reliable improvement, deterioration and attrition. For a full description of outcomes and their definitions see Chapter 5.

Time points

Measures of social leisure activities and close social relationships from the first nine sessions (an initial contact and eight additional contacts with services) were used in

the analysis. In GMM, the number of time points used should be close to the mean number of sessions received in the sample (Lutz et al., 2005). For this sample, the mean number of sessions received (including baseline) was 8.26 (SD=4.60). Measuring nine time points might also be particularly informative as students attending in-house or student specific services are more likely to receive around six sessions, and having data on further sessions might provide additional insight into later effects of treatment.

6.2.3 Data Analysis

Latent growth curve (LGC) analysis

LGC analyses (Bollen & Curran, 2006) were conducted first using MPlus (L. Muthén & Muthén, 1998-2017) separately for the social leisure and close relationships measures in order to establish the best fitting growth model, regarding the form of change, for the data. This forms a useful first step in GMM (T. Jung & Wickrama, 2008; Wickrama, Lee, O'Neal, & Lorenz, 2021). Linear and quadratic curves were fit and compared using the following model fit statistics:

1) Root mean square of error of approximation (RMSEA; (Browne & Cudeck, 1992; Steiger & Lind, 1980)). Values of <0.08 indicate a reasonable model fit.

2) Standardised root mean square residual (SRMR) (Hu & Bentler, 1999). Values of <0.08 indicate a reasonable model fit.

3) Comparative fit index (CFI; (Bentler, 1990)). Values of >0.95 and >0.97 indicate good and excellent fit, respectively.

4) Tucker-lewis Index (TLI; (Bentler & Bonett, 1980; Tucker & Lewis, 1973)). Values of >0.95 and >0.97 indicate good and excellent fit, respectively.

Growth mixture model analyses

Selection of modelling technique

LCGA is a more restrictive form of GMM. Although different classes of growth trajectories are allowed, the variance of the slopes and intercepts within each class

are constrained to zero, thus making estimations of growth for each participant within a class the same (T. Jung & Wickrama, 2008; Mara & Carle, 2021). GMM's without this restriction (referred to henceforth as just GMM), on the other hand, allow the trajectory of change to vary for each participant within a class. In other words, GMMs allow between-class and within-class variability (T. Jung & Wickrama, 2008; B. Muthén, 2001; B. Muthén & Muthén, 2000), resulting in a more flexible approach (Berlin, Parra, & Williams, 2014). There is much debate as to which of LCGA or GMM's are superior (T. Jung & Wickrama, 2008). Most arguments for LCGA centre around resolution of sample size issues, and the reduced computational demand imposed by LCGA due to the reduced number of parameters to estimate (Berlin, Parra, et al., 2014; T. Jung & Wickrama, 2008; Mara & Carle, 2021; Wickrama et al., 2021), while arguments for GMMs reflect the fact that artificially restricting variation (as is the case in LCGA) is less likely to resemble reality (B. Muthén, 2006), and that they are suited to datasets where each "class" is expected to have a trajectory which is not identical in every participant, as is often the case in psychology research (B. Muthén & Muthén, 2000; Rubel et al., 2015). As a result, GMM analyses were used in this analysis.

The best fitting LGC model of the form of change for each of social leisure activities and close relationships was then used to build GMMs using Mplus.

Model fit indices

In order to identify the optimal class solution for both the WSAS3 and the WSAS5, GMM model fit statistics were compared. Based on recommendations by Nylund, Asparouhov, and Muthén (2007), the following were considered the main metrics for model identification:

1. Bayesian Information criterion (BIC; (Schwarz, 1978))
2. Bootstrap Likelihood Ratio test (BLRT; (McLachlan & Peel, 2000))

The following criterions were also considered:

1. Akaike Information Criterion ((AIC; (Akaike, 1987))
2. Vuong-Lo Medell Rubin Likelihood Ratio test (VLMR-LRT; (Lo, Mendell, & Rubin, 2001))
3. Entropy

Lower values on relative fit information criterions (the AIC and BIC) indicate better fitting models. The VLMR-LRT and BLRT compare the model to a model with one fewer class (i.e. the k compared to the k-1 model) and gives the probability that the k-class model significantly improves the model fit (Nylund et al., 2007). Entropy represents the classification accuracy of the model (Jedidi, Ramaswamy, & DeSarbo, 1993). Higher values of entropy indicate higher accuracy and therefore distinct separation between classes.

Procedure

In line with recommendations (Wickrama et al., 2021), each GMM was conducted first with two classes, as there was no prior hypothesis regarding the number of classes in the data. After this, models were run with the number of classes increased by 1 and fit statistics examined between K classes and K-1 classes to establish if the additional class improved model fit. Models which failed to converge as a result of negative residual variances or correlations greater than one were also disregarded, as this indicates poor model fit (Nylund et al., 2007). To prevent the identification of local solutions (when the maximum log-likelihood value is only identified for a certain area on the estimation curve in the initial iterative optimisation process as a result of too few random starting values, but this value is not the largest value for the entire curve (the global solution) (T. Jung & Wickrama, 2008)), 800 random starts and 80 final iterations were used. In all analyses the best log likelihood was replicated, suggesting that the global solution was obtained.

Once an optimal class solution was identified for each of social leisure activities and close relationships, classes for which participants had the highest conditional probability of membership were assigned and extracted.

Associations between trajectories of social functioning and outcomes

Once each student in the dataset was assigned a class based on conditional probability, logistic regression analyses were run to explore the association between trajectories of social functioning (WSAS-3 and WSAS-5 scores) and reliable recovery, reliable improvement, deterioration and attrition using Stata version 16 (StataCorp, 2019). Models were built which controlled for the confounders available

in the dataset. Model 1 compared the association of class membership with outcomes without additional confounders, Model 2 additionally controlled for treatment-related variables (number of low intensity sessions, number of high intensity sessions, weeks from referral to assessment, weeks from assessment to treatment, and service), Model 3 additionally controlled for baseline symptom severity (PHQ-9, GAD-7, and the three IAPT phobia scale items) and Model 4 additionally controlled for other demographic and clinical factors (IMD decile, age, gender, sexual orientation, ethnicity, problem descriptor, presence of long-term health conditions, medication prescription.

Missing data

Missing WSAS-3 and WSAS-5 data were handled using Full Information Maximum-Likelihood through the Expectation Maximisation algorithm (Dempster, Laird, & Rubin, 1977) during LCG and GMM analyses in Mplus.

Missing data on continuous covariates in logistic regression models were imputed using multiple imputations with chained equations (MICE) in Stata. Missing data for categorical covariates were dummy coded as "missing" to ensure that participants with missing information on these variables were included in the analysis. Fifty imputed datasets were created. Regression analyses were conducted using these imputed datasets, with sensitivity analyses conducted on complete data only.

6.3   Results

 The majority of the 5221 students meeting inclusion criteria were female (73.9%) and the mean sample age was 20.64 (SD=2.20). Half of the sample were white (50.1%) and the most commonly reported problem descriptor was depression (39.7%). Average baseline ratings of impairment on the WSAS-3 "Social leisure activities" and the WSAS-5 "close relationships" items were 4.40 (SD=2.25) and 4.16 (SD=2.36), respectively. This corresponds to a rating of "definite" impairment due to mental health symptoms. Additional sample information is displayed in Table 6.1. By session nine, 1,888 students (36.2%) still had individual WSAS item measures recorded (i.e. remained in treatment).

A total of 34,986 WSAS3 and 34,985 WSAS5 scores were recorded for sessions 1-9 (WSAS3: M=3.80, SD=2.27; WSAS5: M=3.58, SD=2.31).

Table 6.1: Sample baseline characteristics and treatment outcomes

Continuous variables		N	M	SD
PHQ9		5,220	15.09	5.21
GAD7		5,219	13.62	4.27
WSAS-2		4,889	3.36	2.33
WSAS-3		4,889	4.40	2.25
WSAS-4		4,888	3.54	2.42
WSAS-5		4,889	4.16	2.36
Agoraphobia Item		5,190	2.97	2.60
Social Phobia Item		5,190	3.57	2.42
Specific Phobia Item		5,189	2.38	2.58
Number LI sessions		5,221	2.95	2.78
Number HI sessions		5,221	5.26	5.41
Number total sessions		5,221	8.26	4.60
Weeks-referral to assessment		5,217	3.34	3.11
Weeks- assessment to treatment		5,078	8.42	7.93
Age		5,221	20.64	2.20
Categorical variables			N	%
Gender	Male		1,346	25.8
	Female		3,856	73.9
	Missing		19	0.4
Ethnicity	White		2,617	50.1
	Mixed		446	8.5
	Asian		948	18.2
	Black		628	12.0
	Chinese		118	2.3
	Other		218	4.2
	Missing		246	4.7
IMD Decile	1		435	8.3
	2		1,362	26.1
	3		1,065	20.4
	4		645	12.4
	5		571	10.9
	6		412	7.9
	7		288	5.5
	8		210	4.0
	9		106	2.0
	10		47	0.9
	Missing		80	1.5
Sexual orientation	Heterosexual		3,607	69.1
	Gay/Lesbian		177	3.4

	Bi-sexual	302	5.8
	Missing	1,135	21.7
Medication	Prescribed not taking	242	4.6
	Prescribed and taking	1,277	24.5
	Not prescribed	3,409	65.3
	Missing	293	5.6
Long term condition	No	3,526	67.5
	Yes	783	15.0
	Missing	912	17.5
Problem descriptor	Depression	2,072	39.7
	Mixed A.D	287	5.5
	GAD	843	16.2
	OCD	200	3.8
	PTSD	129	2.5
	Other Phobia & Panic	308	5.9
	Social Phobia	352	6.7
	Unspecified anxiety	231	4.4
	Missing	799	15.3
Clinical outcomes	Reliable recovery	2,398	45.9
	Reliable improvement	3,738	71.6
	Deterioration	339	6.5
	Attrition	1,487	28.5

WSAS: work and social adjustment scale. A.D: anxiety disorders GAD: generalized anxiety disorder OCD: obsessive compulsive disorder PTSD: post-traumatic stress disorder

6.3.1 Analysis 1: LGC analyses

Table 6.2 shows the fit statistics for both linear and quadratic growth curve models in social leisure activities and close relationships. Statistics indicated that a quadratic model was a better fit for the data for both measures.

Table 6.2: Latent growth curve model fit statistics and estimates of variance

Measure	Model	RMSEA (90% CI)	CFI	TLI	SRMR	Intercept variance (p)	Slope variance (p)	Quadratic variance (p)
WSAS-3: Social leisure activities	Linear	0.062 (0.058-0.065)	0.96	0.96	0.079	3.127 (<.001)	0.064 (p<.001)	
	Quadratic	0.034 (0.031-0.038)	0.99	0.99	0.020	3.150 (p<.001)	0.382 (p<.001)	0.004 (p<.001)
WSAS-5: Close relationships	Linear	0.058 (0.054-0.061)	0.97	0.97	0.072	3.317 (p<.001)	0.058 (p<.001)	
	Quadratic	0.034 (0.031-0.038)	0.99	0.99	0.200	3.142 (p<.001)	0.318 (p<.001)	0.004 (p<.001)

WSAS: work and social adjustment scale. RMSEA: root mean square of error of approximation. CFI: comparative fit index. TLI: Tucker-Lewis index. SRMR: standardised root mean square residual.

Social Leisure Activities

Overall, the quadratic growth curve model for social leisure activities suggested that at the start of treatment, students were on average "definitely" (mean intercept= 4.42, p<.001) impaired in participating in social leisure activities because of their mental health symptoms. This impairment decreased over time on average (mean slope= -0.28, p<.001), although this decrease did not remain constant, as indicated by a significant quadratic effect (mean=0.01, p<.001). There was significant variance remaining in the model (intercept=3.15, p<.001; slope=0.38, p<.001; quadratic=0.004, p<.001), suggesting that a mixture model may be appropriate to explore remaining heterogeneity.

Close Relationships

Overall, the quadratic growth curve model for close relationships presented a similar picture to that of the social leisure activities measure. The model suggested that at the start of treatment, students were also on average "definitely" (mean intercept= 4.16 p<.001) impaired in forming and maintaining close social relationships because of their mental health symptoms. This impairment decreased significantly over time on average (mean slope = -0.26, p<.001), although this decrease did not remain constant, as indicated by a significant quadratic effect (mean=0.01, p<.001). There was also significant variance remaining for this model (Intercept= 3.14, p<.001;

slope= 0.32, p<.001; quadratic= 0.004, p<.001), again suggesting that a mixture model may be appropriate to explore remaining heterogeneity.

Figure 6.2 shows the quadratic growth curves for a) social leisure activities measures and b) close relationships measures at time points 1-9.
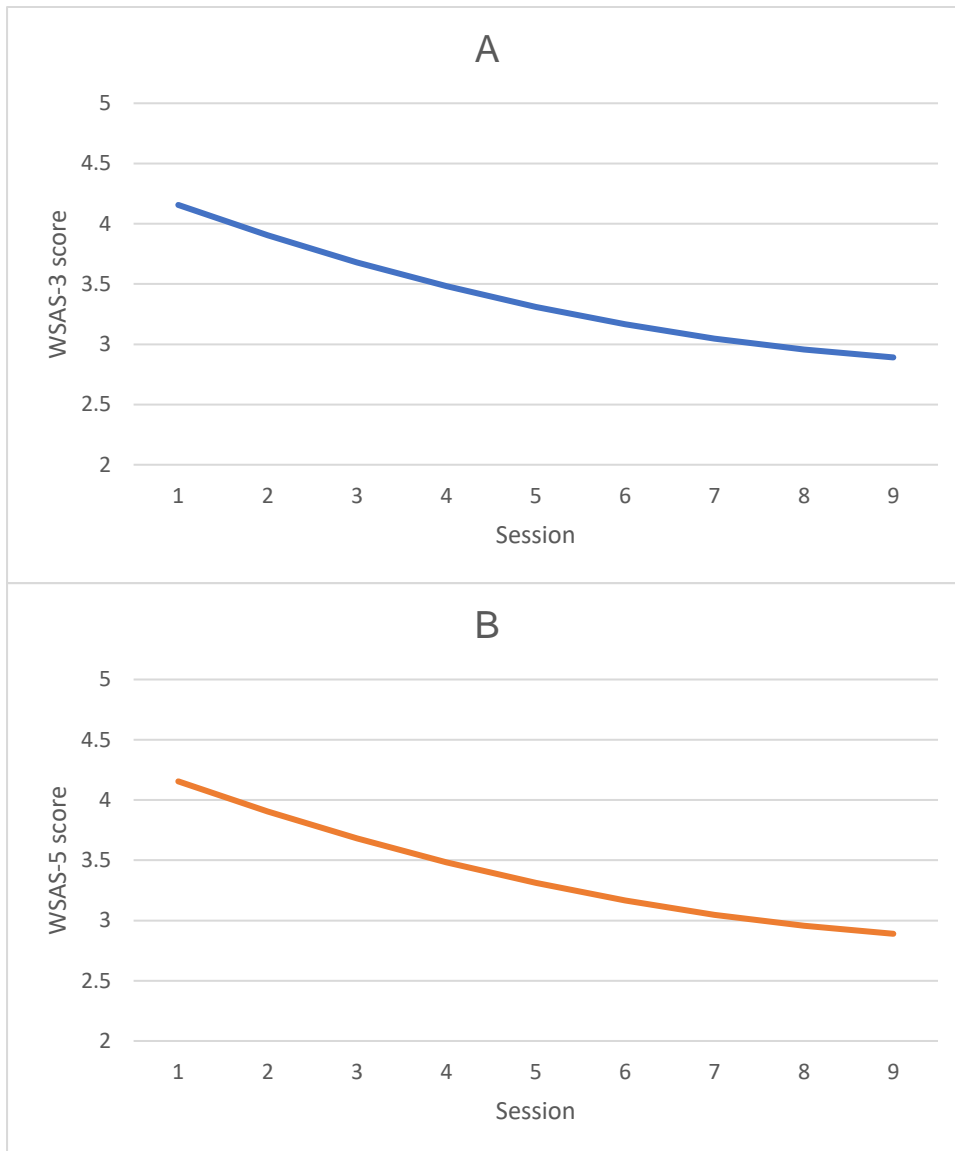
Figure 6.2: Quadratic growth curves for a) social leisure activities and b) close relationships

6.3.2 Analysis 2: Growth Mixture Models

GMM was performed using quadratic models separately on social leisure activities and close relationships measures across nine sessions in order to identify different

trajectories of change in these measures to account for the variance remaining in the quadratic growth models. Table 6.3 shows model fit statistics for both measures, and the percentage of the sample assigned to each class.

Table 6.3: Model fit statistics

Measure	Class solution	Log-Likelihood	AIC	BIC	Entropy	VLMR-LRT p-value	BLRT p-value	% individuals per class
WSAS 3: social leisure activities	2	-64834.99	129714	129858	0.555	<.001	<.001	75/25
	3	-64752.06	129556	129727	0.525	<.001	<.001	19/53/27
	4	-64695.29	129451	129647	0.561	.009	<.001	5/29/12/54
	5	-64636.23	129340	129564	0.611	.001	<.001	50/28/4/15/3
	6*	-64607.05	129290	129539	0.621	.043	<.001	49/1/5/27/3/14
WSAS 5: Close relationships	2	-65068.61	130181	130326	0.578	.135	<.001	70/30
	3	-65014.37	130081	130251	0.624	.022	<.001	67/30/3
	4*	-64933.49	129927	130124	0.63	<.001	<.001	30/3/47/20

*Model failed to converge
WSAS: work and social adjustment scale. AIC: Akaike information criterion BIC: Bayesian information criterion. VLMR-LRT: Vuong-Lo Medell Rubin likelihood ratio test. BLRT: bootstrap likelihood ratio test

Social Leisure Activities

GMMs for the social leisure activities measure were compared for 2, 3, 4, 5, and 6-class models. However, the 6-class model resulted in correlations greater than one between the intercept and slope, the intercept and quadratic, and the slope and quadratic, indicating poor model fit. The 6-class model was therefore disregarded and the 5-class model was selected as the most appropriate model given it demonstrated better fit than the solutions with less classes. The trajectories of the 5-class solution are displayed in Figure 6.3.
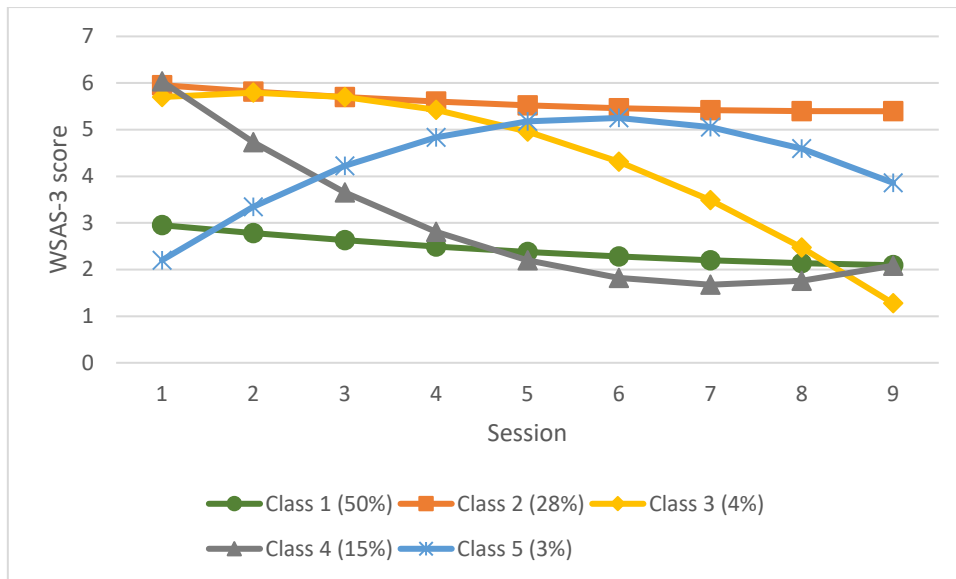
Figure 6.3: Social leisure activities trajectories

Close Relationships

GMMs for the close relationships measure were compared for 2, 3, and 4-class models. As with WSAS3, issues with correlations greater than one between the intercept and the slope, the intercept and the quadratic and the slope and quadratic, indicating poor model fit. The 4-class model was therefore disregarded. Although there was a non-significant VLMR-LRT p-value for the 2-class model, the 3-class model was a better fit for the data, indicated by reduced BIC and significant BLRT p-values. The 3-class model was therefore selected as the most appropriate model for the data. The trajectories for the 3-class solution are displayed in Figure 6.4.
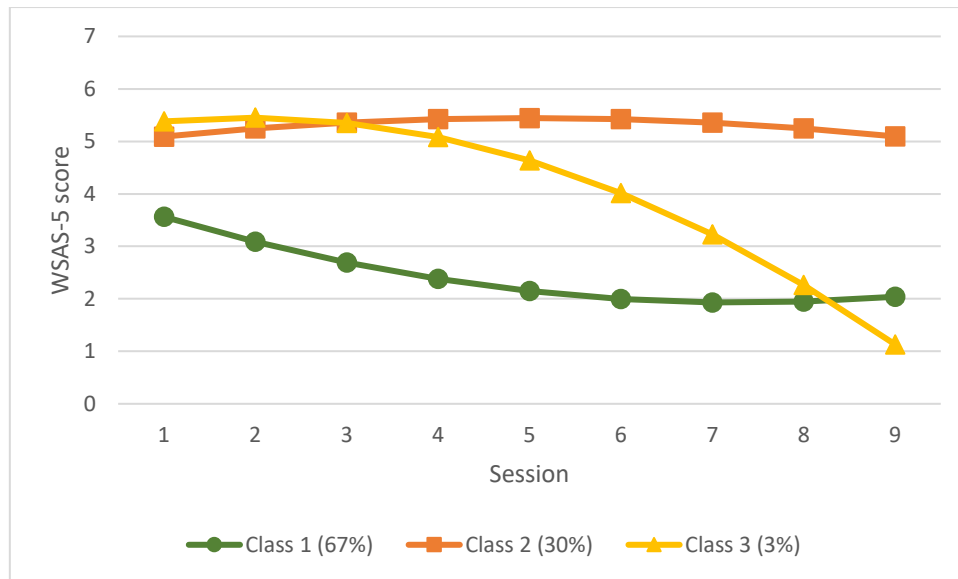
Figure 6.4: Close relationships trajectories

Class trajectories

For both measures, there were classes representing 1) mild (slight-definite impairment responses on average) impairment with some limited improvement over time (estimated mean change between session 1 and 9 = -0.86 for social leisure activities and -1.52 for close relationships) 2) severe (definite-marked impairment responses on average) impairment with limited change throughout (estimated mean change = -0.55 for social leisure activities and 0.01 for close relationships) and 3) severe impairment which remained stable until session 3 and then improved over time (estimated mean change = -4.43 for social leisure activities and -4.24 for close relationships). However, for social leisure activities, there was also a fourth class of students who improved immediately following their first session up until session 7, ending session 9 slightly more impaired than those in the delayed-improvement Class 3 (estimated mean change = -3.96). A fifth class for social leisure activities were the least impaired at assessment (session 1) but became gradually more impaired up until session 6, before slightly improving in impairment through to session 9, where they were still "definitely" impaired (estimated mean change 1.66).

As a result, the classes can be described as follows:

WSAS-3: Social leisure activities

Class 1: Mild impairment with limited change

Class 2: Severe impairment with limited improvement

Class 3: Severe impairment with delayed improvement

Class 4: Severe impairment with early improvement

Class 5: Mild impairment with deterioration

WSAS-5: Close social relationships

Class 1: Mild impairment with limited change

Class 2: Severe impairment with limited improvement

Class 3: Severe impairment with delayed improvement

Comparison between social leisure activities and close relationships classes

When comparing classes between the two measures of social functioning, it is clear that some overlap exists between the two items. For example, 83.2% of those who showed mild impairment with limited change (Class 1) for social leisure activities were also in this class for close social relationships and 62.8% of those who showed severe impairment with limited improvement (Class 2) for social leisure activities were also in this class for close social relationships. However, only 29.8% of those who showed delayed improvement in social leisure activities (Class 3) showed the same trajectory in close relationships. Class 4, which also showed improvement but at an earlier stage also did not share many students with those in Class 3 for close relationships (this class being the only trajectory showing significant improvement over time in close relationships; 2.7%). 86.3% of early improvers in social leisure activities showed mild impairment and limited change (Class 1) for close social relationships, while the largest proportion of students who showed deterioration in social leisure activities (Class 5) showed severe impairment with minimal

improvement (Class 2) for close relationships. Table 6.4 shows the proportions of students assigned to social leisure activities classes who were in each of the close relationships classes.

Table 6.4: Overlap in Class Assignment

Social Leisure Activities Classes	Close Relationships Classes		
	1	2	3
1	2,156	398	36
	83.2%	15.4%	1.4%
2	508	915	33
	34.9%	62.8%	2.3%
3	99	59	67
	44.0%	26.2%	29.8%
4	680	87	21
	86.3%	11.0%	2.7%
5	55	106	1
	34.0%	65.4%	0.6%

Note: percentages expressed as proportion of those assigned to WSAS-3 class

6.3.3 Analysis 3: associations between class assignment and treatment outcomes

Class Description

Descriptive statistics for each class are represented in Appendix 6.2. For both measures, those with mild impairment and limited change (Class 1) tended to also show the least baseline impairment across the majority of other measures, including PHQ-9, GAD-7, and phobia items. In terms of treatment, for social leisure activities classes there was a significant difference in the number of high intensity sessions received, with those with severe impairment and delayed improvement (Class 3) receiving the most (M=6.99, SD=5.41) and those with severe impairment and early improvement (Class 4) receiving the least (M=4.22, SD=4.79). Deteriorators (Class 5) waited the longest between assessment to treatment (M=10.29 weeks, SD=9.35) while those with mild impairment and limited change (Class 1) waited the shortest (M=7.99 weeks, SD=7.64). For close relationships classes, there were differences in both the number of low intensity sessions and the number of high intensity sessions, with those with severe impairment and limited improvement (Class 2) having the

least number of low intensity (M=2.77, SD=2.84) and the highest number of high intensity sessions (M=6.36, SD=5.84). Delayed improvers (Class 3) waited the longest between assessment and treatment (M=9.34 weeks, SD=8.75) while those with mild impairment and limited change (Class 1) waited the shortest (M=8.16 weeks, SD=7.81).

The number of students within each class experiencing reliable recovery, improvement, deterioration and attrition also significantly differed between classes. For social leisure activities classes, the highest proportion of students experiencing reliable recovery were in classes showing delayed (Class 3; 64%) and early (Class 4; 63.3%) improvement and the lowest proportion were in the severe impairment with limited improvement class (Class 2; 25%). The same pattern was true for reliable improvement with the highest proportion in classes 3 (88.44%) and 4 (85.03%) though the lowest proportion was in the deteriorating class (Class 5; 52.5%). Those who deteriorated in social leisure activities (Class 5) were also the most likely to deteriorate in treatment (18.5%) while delayed improvers (Class 3) were the least likely (3.7%). Both those who remained severely impaired (Class 2) and those who became more impaired (Class 5) had high proportions of drop out (39.2% and 37.4%, respectively) compared to those showing delayed improvement (Class 3) in which only 11.6% dropped out. For close relationships delayed improvers (Class 3) were most likely to experience reliable recovery (63.9%) and reliable improvement (88.6%) and those who were severely impaired with limited improvement (Class 2) were the least likely (25.5% and 58.7% for reliable recovery and reliable improvement, respectively). Similarly, while delayed improvers (Class 3) were least likely to experience deterioration (1.3%) and attrition (13.9%), students who remained severely impaired (Class 2) were most likely (11.1% and 39.5% for deterioration and attrition, respectively). A full description of baseline variables and treatment outcomes by class is available in Appendices 6.1a and 6.2b.

Associations between social leisure activities class membership and treatment outcomes

Logistic regression models were used to explore the associations between class assignment according to social leisure activities trajectories and outcomes (see Table 6.5).

After adjusting for all covariates (service level variables, baseline severity and demographic factors), those in Class 2 showing limited improvement from severe impairment in social leisure activities were significantly less likely to reliably recover (OR=0.31, 95% CI: 0.26-0.36, p<.001) and reliably improve (OR=0.37, 95% CI: 0.31-0.44, p<.001) compared to those with mild impairment (Class 1), and were also significantly more likely to deteriorate (OR=3.22, 95% CI: 2.41-4.29, p<.001) and drop out (OR=1.96, 95% CI: 1.61-2.39, p<.001). Those who showed later and earlier improvement in impairment in social leisure activities (classes 3 and 4 respectively), were significantly more likely to reliably recover compared to those who maintained mild impairment (class 1)(class 3 OR= 1.73, 95% CI: 1.28-2.34, p<.001; class 4 OR= 2.07, 95% CI: 1.72-2.48). They were also significantly more likely to reliably improve (Class 3 OR=1.87, 95% CI: 1.22-2.88, p= .004; class 4 OR= 1.80, 95% CI: 1.43-2.26, p<.001). Neither delayed (Class 3) nor early (Class 4) improvers were significantly more or less likely to deteriorate compared to those with mild impairment and limited improvement (class 1; p=0.545 and p=0.253, respectively) but both were significantly less likely to drop out of treatment (Class 3 OR=0.44, 95% CI: 0.28-0.70, p=0.001; Class 4 OR=0.64, 95% CI: 0.51-0.80, p<.001). Those showing deterioration over time (Class 5) were significantly less likely to reliably recover (OR=0.28, 95% CI: 0.19-0.42, p<.001) and reliably improve (OR=0.28, 95% CI: 0.20-0.39, p<.001) compared to those with mild impairment and limited improvement (Class 1). This class with worsening impairment were also more likely to deteriorate (OR=5.95, 95% CI: 3.73-9.50, p<.001) and drop out (OR=2.30, 95% CI: 1.48-3.58, p<.001). Overall those who deteriorated in terms of impairment in social leisure activities (Class 5) had the highest odds of negative outcomes and the lowest odds of positive outcomes. Those who showed early improvement in impairment (Class 4) had the highest odds of reliable recovery while those with slightly more delayed improvement (Class 3) had the highest odds of reliable improvement and the lowest odds of drop out.

Associations between close relationships class membership and treatment outcomes

Logistic regression models were then used to explore the associations between class assignment according to close relationships trajectories and outcomes (see

Table 6.5). After adjusting for all covariates, those with severe impairment and limited improvement (Class 2) were less likely to reliably recover (OR=0.28, 95% CI: 0.25-0.33, p<.001) and reliably improve (OR=0.32, 95% CI: 0.27-0.36, p<.001) compared to those with mild impairment and limited change (Class 1), but they were significantly more likely to deteriorate (OR=3.69, 95% CI:2.87-4.76, p<.001) and drop out (OR=2.34, 95% CI: 1.97-2.79, p<.001). Those who showed delayed improvement (Class 3) were more likely to reliably recover (OR=1.72, 95% CI: 1.21-2.43, p=.002) and reliably improve (OR=1.68, 95% CI: 1.01-2.79, p=.046) than those with mild impairment and limited change (Class 1), although there was no difference in odds of deterioration (p=0.215) between these two classes. Delayed improvers (Class 3) were also less likely to drop out of treatment than the limited change from mild impairment class (Class 1; OR=0.52, 95% CI: 0.31-0.87, p=.013).

Full results of all four regression models are shown in Appendix 6.3. Sensitivity analyses conducted on complete cases only showed similar results (Appendix 6.4).

Table 6.5: Logistic regression analyses controlling for all variables of associations between class membership and treatment outcomes

WSAS item	Class (vs class 1)	Reliable Recovery	Reliable Improvement	Deterioration	Attrition
WSAS-3: Social leisure activities§	Class 2	0.31 (0.26 - 0.36)	0.37 (0.31 - 0.44)	3.22 (2.41 - 4.29)	1.96 (1.61 - 2.39)
	Class 3	1.73 (1.28 - 2.34)	1.87 (1.22 - 2.88)	0.77 (0.33 - 1.80)	0.44 (0.28 - 0.70)
	Class 4	2.07 (1.72 - 2.48)	1.80 (1.43 - 2.26)	0.77 (0.48 - 1.21)	0.64 (0.51 - 0.80)
	Class 5	0.28 (0.19 - 0.42)	0.28 (0.20 - 0.39)	5.95 (3.73 - 9.50)	2.30 (1.48 - 3.58)
WSAS-5: Close relationships §	Class 2	0.28 (0.24 - 0.32)	0.32 (0.27 - 0.36)	3.69 (2.87 - 4.76)	2.34 (1.97 - 2.79)
	Class 3	1.72 (1.21 - 2.43)	1.68 (1.01 - 2.79)	0.41 (0.10 - 1.68)	0.52 (0.31 - 0.87)

* N=5,221 for reliable recovery, reliable improvement and deterioration. N=4,843 for attrition
§ Adjusted for number low intensity sessions, number high intensity sessions, weeks from referral to assessment, weeks from assessment to treatment, trust, PHQ9, GAD7, phobias, Index of multiple deprivation, age, gender ethnicity, diagnosis, long term conditions, medication use, sexual orientation. WSAS: Work and social adjustment scale.

Additional comparisons

Additional logistic regression models were also conducted to compare associations with treatment outcomes between classes who had similar baseline levels of social impairment. Classes who showed delayed and early improvement (Classes 3 and 4,

respectively) for social leisure activities and the class who showed delayed improvement (Class 3) for close relationships were compared to class 2 (severe impairment and limited improvement) Results of adjusted regression models are shown in Appendix 6.5 and sensitivity analyses conducted on complete cases only are shown in Appendix 6.6. Classes who showed improvement in impairment in both measures were significantly more likely to reliably recover and reliably improve, and significantly less likely to deteriorate or drop out compared to those who remained impaired in fully adjusted models.

6.4   Discussion

This chapter identified five different trajectories of change in impairment in social leisure activities, and three in impairment in close relationships in a sample of university students treated in psychological therapy services. While the majority of students experienced mild impairment in these measures of social functioning, with impairment remaining relatively stable throughout treatment, an important proportion (28-30%) of students were severely impaired and remained this way throughout treatment. Smaller but important groups of students were also found whose impairment in social functioning measures improved over the course of treatment or deteriorated over the course of treatment. Associations between these trajectories of change and treatment outcome were also demonstrated.

First, when comparing classes who showed limited change in their level of impairment in social functioning, those who stayed severely impaired on the measure did not benefit from psychological therapy as much as those who remained mildly impaired, with odds of reliable recovery and reliable improvement in more severely impaired students around a third of those students who remained only mildly impaired. This supports previous research (Wang et al., 2018) and suggests that being able to confide in close friends and spending social time with others throughout treatment could be an important facilitator of recovery. Second, improvement in social functioning from severe impairment to mild impairment was associated with better treatment outcomes than maintaining mild impairment from the start of treatment, which additionally suggests that positive changes in social functioning are associated with students who are responding well to treatment.

Importantly, classes showing such improvement also had around half the odds of dropping out of treatment. This could suggest that perceptions of improvement in social aspects act as a motivator to continue therapy over and above improvements in clinical symptoms. Third, although only observed in impairment in social leisure activities, deterioration in impairment was associated with over five times the odds of deterioration in terms of mental health symptoms. This further supports the fact that social functioning is a key aspect to consider in recovery and may be intrinsically linked with the experience of symptoms of mental health problems.

These findings support previous research into psychological therapy which examined trajectories of changes in symptoms. For example, Lutz et al. (2014) found that early changes in symptoms were strong predictors of outcomes with those showing rapid vs more delayed decreases in panic disorder symptoms having the strongest association with later recovery. Haas, Hill, Lambert, and Morrell (2002) found that students who were early improvers on a measure of psychological functioning (including interpersonal functioning) were more likely to respond to psychotherapy. While the current analysis identified groups of students showing a delayed (typically after the third session) response to treatment which predicted positive outcomes, there was also a group of students who showed a rapid decrease in impairment in social leisure activities, similar to the rapid decreases in the more clinical symptom measures described by Lutz et al and psychological functioning described by Haas et al. This decrease began from the first session, when it is unlikely that substantial intervention had taken place. As Haas et al. (2002) point out in relation to rapid improvers, this could suggest that for some, specific aspects of treatment are less important than non-specific or common factors such as therapeutic alliance (Baier et al., 2020; Windle et al., 2020). However, in this analysis, improvement for this group began after the session which typically represents an assessment session only, meaning that although a positive assessment can contribute to good alliance, it is possible that for some, taking the step of seeking help in the first place is in itself a major change point at which students begin to participate in more social activities. This may in turn bolster future treatment gains. Furthermore, the fact that those students experiencing positive change in social functioning had higher odds of positive treatment outcome compared to students with mild but unchanging impairment, supports the notion that students may place particular importance on

their ability to participate in more "social" aspects of university. They may use this as a personal marker of their recovery, which in turn could facilitate motivation and progress in therapy. Hawkins, Lambert, Vermeersch, Slade, and Tuttle (2004), for example, reported that participants who received feedback on their progress in therapy had better outcomes compared to those who did not. Although patients in IAPT services do receive session-by-session feedback on their progress in terms of mental health symptom severity, forming new close friendships or increased socialising may act as a more motivational form of explicit feedback, facilitating a similar effect. This notion is supported by previous research with young people, who report favouring more social compared to clinical markers of recovery, such as the regaining of their "place in world" and "sense of self" (Simonds, Pons, Stone, Warren, & John, 2014) and young adults, who consider reconnection with friends and family a vital part of recovery (Rayner, Thielking, & Lough, 2018).

However, it is important to note that a comparatively small sub-set of students experienced a large amount of change (positive or negative) in relation to their level of impairment in social functioning across the nine sessions of treatment. While 15% of all students experienced a rapid improvement in social leisure activity participation, only 4% and 3% of students showed the slightly more delayed improvement in social leisure activities and close relationships, respectively, which could be associated with a response resulting directly from the therapy received. This could be indicative of the fact that at present, psychological therapy as currently provided may not be sufficiently focused on the social aspects of student life at university. While the data provided here cannot imply causation, it does raise the question as to whether more students would experience positive outcomes if a focus on social functioning was a part of their treatment.

Although the current study cannot establish that improvement in social functioning is a driver of improvement in symptoms (rather than vice-versa), others have tested this hypothesis through the development of interventions targeting social functioning. For example, Haslam, Cruwys, Haslam, Dingle, and Chang (2016) found that young adults provided with an intervention which targets development and maintenance of social group relationships significantly improved their mental health and wellbeing at end of treatment and six-month follow up. A later larger-scale trial in adults with

diagnosed depression or experiencing at least mild symptoms of depression found that targeting social connectedness with the same intervention was as effective as standard care in reducing depressive symptoms, but more effective in those not taking medication for their symptoms (Haslam et al., 2019). Furthermore, a systematic review of social interventions found that a range of strategies which encourage interactions with others may be effective in reducing depression in adults (E. Nagy & Moore, 2017), and another review reported that social identification building therapy programmes are particularly effective (Steffens et al., 2021).

The difference in the number of classes of trajectories between close relationships and social leisure activities is also of interest. For example, the majority of students who improved rapidly in social leisure activities were only mildly impaired in their ability to form close social relationships at assessment. This could be representative of the fact that having a support network of close friendships can facilitate students in stepping outside of their comfort zone to participate in social activities, even where the impairment in other aspects of social functioning is substantial at the beginning of treatment. This is supported also by the fact that the majority of students who deteriorated in social leisure activities were in the class that was severely impaired and remained so in close social relationships. Previous research also supports this hypothesis. For example, Grant-Vallone, Reid, Umali, and Pohlert (2003) found that levels of social support were associated with both academic and social adjustment in college students. The authors argued that a support network can encourage students to actively participate in university life which may in turn reduce stress and improve academic success. Furthermore, it is possible that social networks can enhance the sense of control over desired outcomes in specific situations (such as during leisure activities) and encourage reinterpretation of events in a more positive light (Heaney & Israel, 2008; Thoits, 1995), possibly making participation seem less daunting in the face of symptoms of depression or anxiety. It follows that within the constraints of time and funding for mental health support for students, integration of support with forming social relationships/group memberships to build social support networks may yield more benefit than more traditional behavioural activation interventions which focus only on taking part in activities rather than close social relationships alongside this (Haslam et al., 2019; Haslam et al., 2016).

6.4.1 Limitations

Despite the strengths of this analysis in shedding light on the association between social functioning and treatment outcome, some limitations should be noted. Two classes in this model comprised less than five percent of the sample. Some have argued that classes of this size are an indication that a solution with fewer classes is preferable (Gueorguieva, Mallinckrodt, & Krystal, 2011; Spinhoven et al., 2016). However, others have argued that in larger samples, classes with as small as one percent of the total sample included can indicate a meaningful group of people (Mara & Carle, 2021). In the current analysis, although some classes comprised only three percent of the sample, this is a noteworthy group size (156 students), and therefore it can be argued that these classes are clinically important.

In addition, there is a possibility that the association between trajectories of social functioning and treatment outcome is the result of classes of change being demonstrative of baseline severity across a range of symptomatic measures, which in turn predict treatment outcomes. To account for this, logistic regression analyses controlled for baseline depression and anxiety scores, and furthermore these scores did not definitively predict class trajectory (for example, baseline depression and anxiety scores were similar in classes that remained severely impaired and classes that improved). Supplementary analyses comparing classes with similar intercepts were also conducted to account for this, finding larger odds for positive and smaller odds for negative outcomes in classes that improved social functioning compared to classes that remained impaired. Despite this, a major caveat of the current research is that the causal mechanism or direction between mental health symptoms and social functioning cannot be established. One way to explore this in future research could be the use of cross-lagged panel models, which help to untangle the timing of changes in measures to establish which of two factors occurs first (Kearney, 2017). While research has shown that loneliness in the preceding year predicts symptoms of depression using this technique (Cacioppo et al., 2010), establishing whether changes in social functioning occur prior to symptomatic improvement during treatment could further elucidate how adaptations to treatment could enhance recovery for students. Additional research using RCTs comparing interventions with and without support in developing social networks during university (for example, the

addition of an online, moderated social communications platform to evidence-based therapy (Rice et al., 2020)) could also contribute significantly in establishing whether such efforts should be integrated into university mental health support models, as well as models of support for other treatment populations.

It is also important to highlight that this analysis used a limited measure of "social functioning" through the WSAS, and used only single items of the overall scale (items for social leisure activities and close social relationships), in order to target those aspects of social functioning which are most likely to impact on student life. Use of single items may have limited the variance within available scores, as well as the validity of the measure. Also of note, the WSAS measures the extent of impairment in social functioning experienced as a result of mental health symptoms. Although within the IAPT dataset the WSAS is the best available measure of social functioning, this connection between social functioning and mental health could mean that results are more likely to be correlated with mental health outcomes than other measures of social functioning which measure aspects of social functioning in a way separate from the experience of mental health symptoms. Establishing improved and more detailed measures of social functioning, particularly in regard to specific aspects such as loneliness, or motivation to participate in social activities, would allow for a more thorough and nuanced understanding of how changes throughout treatment in social participation and functioning are related to overall improvement in symptoms. Furthermore, qualitative research which explores patient experiences of how changes in social functioning relate to their experience of treatment (and vice versa) could further understanding of how symptomology and social functioning interact.

6.4.2 Conclusions

Overall, students experience different trajectories of change in impairment in social functioning during the course of mental health treatment, and there is an association between the trajectory of change and treatment outcome. Given that improvements in social functioning are associated with increased odds of positive treatment outcome, changes in social functioning may be associated both with how effective psychological treatment is for a given individual and their personal recovery

experience. Future work should look to establish whether the addition of interventions (or components of interventions) to support improvement of social functioning within therapy can further contribute to positive outcomes of treatment for students.

Chapter 7: General Discussion and Conclusions

7.1   Summary of findings

This thesis aimed to explore whether an understanding of the specific mental health difficulties faced by university students could improve the experience and outcomes of university mental health treatment and support. This was addressed through a series of mixed-methods research studies:

1) A systematic review and meta-analysis of RCTs in student populations of psychological interventions for depression, anxiety disorders, eating disorders, PTSD and self-harm was conducted, with a specific consideration of whether the content or delivery of the intervention was designed with student-specific factors in mind

2) A cross-sectional survey of preferred sources of mental health support in students experiencing symptoms of mental health disorders with comparisons between home, EU and international students

3) A series of qualitative semi-structured interviews and a confirmatory focus group study of student experiences of mental health support with recommendations for further service development

4) A multivariate logistic regression analysis to explore whether students experienced different treatment outcomes when attending NHS routine psychological therapy services compared to young adults of the same age who were in employment

5) Growth Mixture Model analysis to establish whether there were sub-populations of students using psychological therapy services with different trajectories of change in social functioning, and multivariate logistic regression analyses to explore associations between trajectory of change and treatment outcomes.

From this research, a number of key conclusions and points for further consideration arose:

7.1.1 Adapting psychological interventions for students

The results of the systematic review and meta-analysis in Chapter 2 suggested that whilst generally psychological treatment for depression, anxiety disorders and eating disorders was beneficial in students, the few adaptations for students investigated in studies were found to be of little benefit compared to non-adapted interventions. Tentative evidence suggested that providing more treatment sessions and possibly transdiagnostic treatment approaches may be useful adaptations. However, post-hoc examination of studies with transdiagnostic aspects revealed that the majority were descriptively transdiagnostic (i.e. they did not specifically target causal mechanisms for co-occurrence of processes within different disorders; Harvey et al. (2011) & Sauer-Zavala et al. (2017). This implies that what might drive the associations of these studies with positive outcomes is that the targets of treatment (for example, increasing ability to cope with stress), which may be broad enough to consider the interventions transdiagnostic, may be experienced by students as more directly applicable to their mental health problems rather than targeting a transdiagnostic mechanism per se. This fits with an approach to psychological treatment in general, but also particularly in young people, to not be limited by too narrow a focus on symptom severity as a measure of effectiveness, but rather a focus on outcomes across multiple domains (e.g. general wellbeing, perceived ability to cope with academic tasks) in order to address the needs of young people experiencing mental ill-health (Hickie et al., 2019). Studies comparing mechanistic or specific intervention components also alluded to this- although the evidence was mixed, those interventions with additional support or a broader contextualisation of interventions to take into account social components or education in coping with mental health problems resulted in more benefit compared to similar interventions without these additional elements (Hinton & Gaynor, 2010; Timpano et al., 2016; Walker & Lampropoulos, 2014). Similarly, for some young people the multidimensional and continuously changing nature of their symptoms (Bystritsky, Nierenberg, Feusner, & Rabinovich, 2012) suggests that treatment models which acknowledge and attend to the difficulties of everyday life, rather than those which are constrained by diagnostic categories may be more effective.

7.1.2 Modular transdiagnostic approaches

Support for such transdiagnostic approaches to symptomatology continues to grow across a range of populations (Dalgleish, Black, Johnston, & Bevan, 2020), with the focus shifting towards the potential utility of modular approaches in particular (Marchette & Weisz, 2017). Modular approaches (e.g. Chorpita, Daleiden, and Weisz (2005) in children and adolescents and later adaptations of the same approach for adults by Black et al. (2018)) implement a single system with different treatment modules within it, and protocols which guide the clinician through the delivery of care. This can focus on both the proposed mechanisms of disorders which is linked with evidence-based practice but also individualization of treatment, including taking account of patient-specific goals and comorbidities (Dalgleish et al., 2020). This modular process moves away from the broad transdiagnostic treatment targets seen in the systematic review in this thesis.

7.1.3 The importance of social support

In Chapter 3, a cross-sectional survey provided evidence for the importance of social networks, finding that the most commonly reported and preferred form of mental health support was via informal sources, such as friends, partners and family. Comparisons between home, EU and overseas students did not demonstrate any differences in preferences for informal support, suggesting that even in universities with a highly diverse student population, an important route to mental health care remains via friends and family. This may be via direct support or via encouragement to use more formal mental health services (Rickwood et al., 2007; Stunden et al., 2020). This work highlighted the link between social support and mental health, suggesting that a potential risk factor for students may be a lack of informal contacts and social networks when first seeking help or if relapsing.

7.1.4 Supporting access to mental health support

Comparisons between international and home students, however, highlighted an additional consideration in the organisation of university mental health services. International students were less likely to seek support from personal tutors, GPs and university support staff. Although in this study it was not possible to ascertain the

reasons for this, these results may indicate that university models of support should encompass adaptation not only to treatments but also in routes of access to support, to ensure all students are aware of the sources of support available to them. The importance of improving the visibility of access points within specialist mental health care for youth has been highlighted in previous work (McGorry, Bates, & Birchwood, 2013), with related co-designed youth strategies also understanding the importance of such access points being more informal or "soft entry" practices such as those through peer support (McGorry et al., 2022). However, the survey in this thesis did not find that students frequently endorsed peer support services, regardless of home, EU or overseas status. It was not clear whether this was due to a lack of visibility of such services at the university or whether students did not wish to use them.

7.1.5 A 'whole university approach'

The qualitative interviews conducted in Chapter 4 further highlighted the need for simple routes of access to mental health support alongside increasing accessibility and choice of treatments through external sources. Such findings resonate with the literature advocating for a 'whole university approach' (Hughes & Spanner, 2019; Priestley, Broglia, et al., 2022), in which provision of support is coordinated across the university as well as different support services, including those provided externally, to provide clear signposting, promote prompt access to treatment (Priestley, Broglia, et al., 2022) and provide integrated evidence-based practices and support (Hughes & Spanner, 2019).

The concept of a 'whole university approach' goes beyond models of clinical provision to consider how they are accessed and also incorporates aspects of support in the transition to university, including accommodation and initiatives to tackle isolation and promote social integration for all students (Hughes & Spanner, 2019; Priestley, Hall, et al., 2022). Students interviewed in Chapter 4 discussed ways to facilitate a streamlined process of access and expanded treatment options, but they also frequently supported the importance of this broadened support network in their conceptualisation of 'good mental health support'. In contrast to the results of Chapter 3, interviews with students did suggest that peer support may be a viable

means of signposting to treatment and preventing students from dropping out between multiple referrals via first-hand knowledge of the system. This suggests that such services were not well known about at university, or that students were unsure of the best way to access these services. Ensuring that peer supporters which are trained for resource-linking or education of peers about treatment options, self-care or other self-help strategies are visible and accessible to students may also be of benefit to peer supporters themselves, as research suggests they may also experience positive mental health benefits through participation in peer support programmes (B. A. Johnson & Riley, 2021). Interviewees also discussed feelings of invisibility and abandonment while at university, further highlighting the importance of an approach which supports student integration into university life including being aware of the available support options for their mental health, physical health, or education (Priestley, Hall, et al., 2022).

7.1.6 A 'whole university approach' or a 'whole system approach'?

In Chapter 5, a logistic regression analysis explored whether NHS routine psychological (IAPT) services, which constitute a relatively non-specific evidence-based approach to mental health treatment, are as effective in students as other employed adults. The analyses demonstrated that students had significantly reduced odds of positive treatment outcomes compared to employed adults of the same age, even when matched on sociodemographic and clinical characteristics. These results suggest that arguments for a 'whole university approach' which integrates with external support services such as those provided by the NHS should also consider how best to adapt these services to combat the negative impact of factors such as academic or social concerns, which may be specific to university attendance, on treatment outcomes. Alternatively, referral to external services may best be accompanied by previously discussed and agreed personalized support for students reporting difficulties within university services. It is likely that both approaches may be needed and it will therefore be important to develop clear integrated and collaborative pathways which bring together these elements in an evidence-informed manner, as recommended by guidelines in adults (National Institute for Health and Care Excellence, 2022). The analysis in Chapter 5 is the first time that research has compared treatment outcomes between students and non-students, but does

contrast with cohort studies which compared severity of symptoms between these groups, finding no difference (Tabor et al., 2021). As such, developing psychological treatment services so as to be better equipped to support the specific difficulties of students can help to ensure that students are not at greater risk of continuing mental health difficulties compared to their non-student peers. At present, it is also not clear what the 'ideal' balance of university-based and externally-based mental health support is for students.

7.1.7 The relationship between social functioning and treatment outcomes

Drawing on the findings that friends, family, partners and other members of close social support networks are a favoured form of mental health support (Chapter 3), and the present disparity between student and same-age employed adult IAPT outcomes, Chapter 6 sought to explore the association between changes in social functioning and psychological therapy service outcomes. Results demonstrated that in those who do seek help in psychological therapy services, there were different trajectories of change in impairment in social functioning during the course of treatment. Furthermore, students who showed improvement in social functioning over time were more likely to experience positive treatment outcomes than either a) students who maintained a poor level of social functioning throughout treatment or b) students who began treatment with a better level of social functioning and maintained a similar level throughout treatment. Although this chapter was not able to ascertain causation (i.e. that improvements in social functioning were drivers of positive treatment outcomes rather than vice versa; see Chapter 6 for a full discussion), it was able to highlight that successful psychological treatment may be related to positive changes in aspects of social functioning - in this particular case, improving close social relationships and participation in social leisure activities with others. This further highlights the importance of social support networks in students experiencing mental health difficulties.

These results also raise a question about the merit of traditional symptom-targeted treatments, the correlation between social functioning and psychological treatment outcomes suggesting that interventions which also focus on social support can strengthen social support networks which in turn may contribute to a reduced risk of

relapse. This may be particularly important in university settings, where social activities and friendships are considered a prominent aspect of university life (Priestley, Hall, et al., 2022), and where being socially isolated may act as both a maintenance factor and a precipitant to onset of mental health disorders (Richardson, Elliott, & Roberts, 2017). As noted above social isolation may also impact negatively on help-seeking. Universities should recognise the role of social support and social isolation in wellbeing and integrate it into mental health and well-being policies- at the prevention, help-seeking, promotion, and treatment levels.

7.1.8 Strategies to support students to improve social functioning during psychological interventions

Many psychological interventions have a focus on improving social engagement and functioning, for example for specific types of social avoidance in social anxiety disorder or more general social avoidance, albeit with different underlying mechanisms, in depression or agoraphobia. Although greater social engagement may follow on from recovery from mental disorders, many such interventions by their very nature do not focus on changing the wider social environment. It has been argued that universities have an important role in developing a sense of belonging (Gopalan & Brady, 2020), which has been described as a fundamental human motivation (Baumeister & Leary, 1995), and which may constitute a key means of enhancing mental health and well-being. Within a university setting, a sense of belonging can include the feeling of being valued and respected by peers, and feeling part of a community (Hausmann, Ye, Schofield, & Woods, 2009; van Gijn-Grosvenor & Huisman, 2020). In the US, positive correlations were found between students reporting "belonging" at college and mental health (Gopalan & Brady, 2020), with the authors calling for further research to understand how student experiences of belonging may be impacted by institutional qualities. Given the reports of feelings of invisibility and abandonment both in general and specifically relating to mental health support in the interviews conducted in Chapter 4, it may be that the current structure and challenge experienced in accessing university based mental health services may contribute to a reduced sense of belonging in students, which may in turn hinder mental health recovery.

7.1.9 Improvements in social functioning as objective feedback on therapy progress

This thesis also focused on the importance of social functioning as both a target for intervention and an important outcome of successful interventions (see Chapter 6). Although much research has reported on the benefits of progress feedback on symptoms to clinicians (e.g. Lambert et al., 2001; 2003; Clark, 2011), there has generally been less focus on social functioning. This contrasts with what many people value as outcomes (Damsgaard, Overgaard, & Birkelund, 2021), and students in particular may value social outcomes such as friendship (Rayner et al., 2018; Simonds et al., 2014), the role of which in facilitating additional treatment benefit has not been the subject of research focus. This view is supported by the logistic regression analyses in Chapter 6 which demonstrated that improvement in social functioning was associated with reduced odds of dropping out, even when compared to those who were not particularly impaired in social functioning. Given the potential benefit of treatment strategies (Chorpita et al., 2013) which adopt a modular approach to the provision of treatment, it is conceivable that a "module" focused on relationship development and social support networks may be beneficial and increase engagement with treatment and its outcomes through an explicit focus on the measures of social functioning.

7.1.10 Definitions of recovery

Together, the research of this thesis supports the importance of defining recovery in a manner which goes beyond symptomatic change and is therefore contextualised within a broader definition of wellbeing and feelings of being supported both academically and socially. Put differently, for students at university, the objective becomes focused on increasing their capacity to participate as fully as they would like in university and to maximise their potential. Such themes have also been discussed in relation to personal recovery, which focuses on growth and development rather than a return to a previous state without the presence of symptoms (Rayner et al., 2018), and this arguably fits with ideals of a university acting as a place for young adults to develop both intellectually and also more generally as they transition to adulthood (Law et al., 2020; Rayner et al., 2018).

In a qualitative interview study on perceptions of personal recovery in university students, Rayner et al., (2018) highlighted that in contrast to adult reported perceptions of recovery where environmental (non-clinical or symptom-based) processes were seen to have a limited impact on recovery, in young people, environmental processes formed an integrative part of the recovery journey. The authors identified themes relating to personal (e.g. identity, self-efficacy), systematic (e.g. friends/peers, family discord, access to support) and macro (e.g. stigma, lack of mental health awareness) level ecological factors. These themes fit with the models of mental health problems as discussed in Chapter 1 such as the Life Course Health Development Model (Wood et al., 2018) and suggest that young adults view their mental health with reference to their environmental context, making it imperative that models of both general wellbeing and mental health treatment at university consider such factors as well as more personal symptom-related care. Within this understanding, it should be noted that socioeconomic factors such as poverty can have a strong influence on both perceived and actual ability to participate in university life, and therefore additional efforts to ensure equality of opportunities to participate, particularly given increasing financial pressures on students (McCloud & Bann, 2019). This further supports the importance of providing psychological interventions in context for students, given how changes in everyday life activities can have a significant impact on perceptions of recovery.

7.2   Limitations

The findings of this thesis should be interpreted with some important limitations in mind. Firstly, although the aim of the thesis was to consider potential adaptation to university mental health support models in totality, the eventual focus shifted towards consideration of treatment models for students with anxiety disorders and depression predominantly. This reflects the predominance of these disorders in the student population and echoes the focus of existing research. It is also reflected in the fact that the majority of respondents in both Chapter 3 and Chapter 4 reported experience of these mental health disorders, and IAPT services primarily support people with anxiety disorders and depression. This fits the wider narrative of student mental health with the majority of student-reported mental health disorders falling under these categories (Oswalt et al., 2020). Nevertheless, it is important to consider

the needs of students experiencing a range of symptoms of mental health disorders including eating disorders, self-harm, substance misuse disorders, psychosis and bipolar disorder. Adequate capacity must be built into services to support all students, either directly or via integrated routes to external care. The impact of not addressing this was evidenced in Chapter 4 where students discussed the negative experience of being informed the services could not help them with their difficulties (see Appendix 4.2). Self-harm and suicidal ideation are becoming increasingly prevalent in university settings: although the systematic review in Chapter 2 found little evidence of RCTs aimed at improving such experiences for students, estimates suggest that around 10% of students consider suicide every year (Mortier et al., 2018). Notably research has suggested that the most important intervention for such students is encouraging help-seeking (Czyz et al., 2013; Simone & Hamza, 2020), and therefore it is hoped that aspects of this thesis can contribute to the development of models of service provision which encourage students to ask for help whatever the nature of their problems. This also highlights the potential benefits of a transdiagnostic approach to support which incorporates "modules" for supporting a variety of problems, for example, support with gambling or drug and alcohol use which may also constitute a necessary contextual consideration for students (Blanco et al., 2008; Nowak, 2018).

Other notable limitations within the thesis relate to the use of the IAPT dataset. As outlined in Chapter 5, the nature of the dataset in recording those who are studying at university may have limited the applicability of the question to students who also work alongside their studies. Such students may represent a distinct population who may have different needs in terms of both mental health, general wellbeing and social integration support. Future research should set out to determine what these needs may be and ensure they are also considered when developing university mental health services. The IAPT dataset is also limited in its measurement of variables relating to social functioning: IAPT uses the WSAS (Mundt et al., 2002) which is not a measure of social functioning per se but one which focuses on how mental health problems may impair abilities to fully participate in social and occupational activities. Further research should be conducted to establish whether the associations found between social functioning and treatment outcomes (as measured in this thesis) can be replicated with more student relevant measures of

social functioning such as social isolation, feelings of belonging and the presence of a social support network (Hausmann et al., 2009; Priestley, Broglia, et al., 2022). An additional consideration with IAPT services is that it was not possible to ascertain whether students were only using the support provided within IAPT or whether they had also sought such external support alongside university-based wellbeing services. Chapter 3 demonstrated that students often utilise more than one source of support and therefore this may have biased results of both Chapter 5 and Chapter 6. Clearly establishing whether students were using only IAPT services and comparing them to students using other university-based sources of support alongside could be an important way to help clarify which aspects of traditional university support could best work with other psychological therapy services, and explore whether there are any combinations of internal and external support which have a detrimental impact.

Other limitations relate to the generalisability of the findings presented. Findings from both the survey presented in Chapter 3 and the qualitative interview study presented in Chapter 4 were based on data from only one university. IAPT data used was also from NHS Trusts located within London. While the findings echo those of similar studies (D'Avanzo et al., 2012; Nguyen et al., 2019; Quinn et al., 2009), supporting their generalisability, it is important to consider how experiences of students attending an inner-city university may differ compared to universities which may be based in a more rural location or may be more campus-based. As previously outlined, such contextual factors may be an important aspect of wellbeing for students and therefore it is important to ensure that such factors are considered when developing university treatment models, with input from students with experience of mental health disorders attending each specific location.

7.3   Implications for practice, policy and research

Overall, the findings of this thesis support further work and consideration in the following key areas.

7.3.1   The role of university in mental health and wellbeing

In line with calls for a 'whole university approach' to mental health, the role of universities in supporting mental wellbeing should be reviewed. Although a

significant number of students arrive at university with pre-existing mental health disorders (Stein, 2013), thereby reducing the impact of primary prevention for some students, consideration of factors which may prevent exacerbation/recurrence of difficulties with mental health problems for these students as well as preventative measures for those who do not have mental health disorders would be a beneficial aspect of university mental health services. Such preventative measures could include 1) social and educational interventions with an explicit focus on developing a mentally healthy community to prevent the onset of problems, 2) building on (1) a stepped-care approach to the delivery of mental health interventions including peer support, self-help and formal mental health interventions such that students at risk of or with existing mental health problems feel that available support is relevant to them and 3) ensuring a 'whole university' and indeed a 'whole system' approach to student wellbeing and mental health which, as part of a stepped-care system, ensures effective integration of educational and social support provided by the university and mental health care provided by the health service. This would mean that there are sufficient opportunities for students to feel a greater sense of community and belonging within university.

7.3.2 Routes of access

In line with the stepped care model, universities should also take steps to simplify the processes required to access formal support and ensure ongoing support. The initial engagement phase should have a particular focus, given student reports that current external options may not support students in all aspects required for them to develop a sense of personal recovery. Clear and easily reached points of access, which all university staff members as well as trained peer supporters can easily refer/signpost to, may be one way of ensuring students do not feel lost when in crisis. Improved communication between GPs, the NHS, or other external mental health services and university mental health services may also ensure that students entering treatment via alternative means are not "abandoned" arising from multiple referrals between services accompanied by long waiting times.

7.3.3 Re-conceptualising treatment options

The development of transdiagnostic approaches has been examined in children and also in adults (Black et al., 2018; Chorpita et al., 2005). Adopting a less a diagnosis-driven intervention and more needs-based transdiagnostic model may also result in more positive outcomes for students. One potential avenue for further research is trials of whether a modular approach, integrating social support with evidence-based models of care to form a personalized treatment plan, is feasible and effective in a university context.

7.3.4 Understanding the role of social functioning

The GMM's described in Chapter 6 illustrated the association between trajectory of change in social function and mental health treatment outcomes, possibly representing the benefit that social aspects have on the efficacy of psychological treatment. However, in order to establish whether or not improvements in social functioning precedes changes in symptom severity, therefore informing a potential mechanism of treatment effectiveness, more work should be done to establish the sequencing of changes on both measures. If social functioning improves prior to symptom improvement, this could provide evidence of causality. Cross-lagged panel models may be one way of establishing this- these estimate the directional influence variables have on each other over time (Kearney, 2017). Alternatively, in line with the work of Haslam et al. (2019) and Rice et al. (2020), an RCT which compares treatment with and without support with social functioning or developing social support could also address questions regarding whether this support is a driver or outcome of clinical improvements in students.

7.3.5 Measures of social functioning and wellbeing in student populations

The measurement of wellbeing is problematic in students and likely involves factors not relevant to other age groups (Dodd et al., 2021). In a recent report, Dodd and Byrom (2022) argue that wellbeing within the student population requires a new definition which includes all relevant components (including measures of social support), before operationalising measures of wellbeing that map onto this definition. It follows that a novel measure of social support would be an important addition to

student mental health research, and could facilitate comparisons of the effects of different support models, as has been argued for similar efforts in children and adolescents (Deighton et al., 2016). While some measures of wellbeing which consider social support have been used in student populations, such as the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS; Tennant et al. (2007)), the Clinical Outcome Routine Evaluation (GP-CORE; Evans, Connell, Audin, Sinclair, and Barkham (2005)), and the BBC Wellbeing Scale (Kinderman, Schwannauer, Pontin, & Tai, 2011), it is important to ensure these remain valid when used within this population (Dodd & Byrom, 2022), with the possible requirement of adapting them to more adequately represent the experiences of students. Work towards this goal could additionally include qualitative work with students to ensure that such a measure accurately reflects what they consider to encompass what is important for wellbeing in terms of social support, social functioning and a sense of belonging. Further research should consider the development of a new social functioning measure in this population, as use of individual items from other measures may result in problems with validity and variance. Similarly, when considering outcome measurement in students, additional attention should be given to addressing the needs of groups which may be particularly hard to reach, both in terms of responses to research and access to services. Although much research has reported that females may be particularly at risk of experiencing anxiety and depression at university (Finan et al., 2018; Lim et al., 2018), females are more likely to receive mental health treatment than males (Cadigan et al., 2019) which could mean that efforts to get a clearer picture of wellbeing or response to recovery through routine outcome measuring misses the experiences of an important group of students, namely males who may be resistant to seeking help. This was supported in the current thesis, with fewer males responding to the SENSE survey in Chapter 3 and very few male respondents agreeing to participate in the qualitative study in Chapter 4.

7.4   Conclusions

The aim of this thesis was to explore what is specific about the experience of university students with mental health problems and how this might inform improvements in mental health treatment provision at university. Through this

exploration, it can be concluded that psychological interventions could be adapted to further improve student outcomes. Evidence for the importance of social support in wellbeing, help-seeking and mental health treatment also indicates that a potential avenue for treatment adaptation could be the addition of components to enhance social networks and functioning, perhaps as a part of transdiagnostic interventions. In addition, more research is needed to establish causal mechanisms and the efficacy of such interventions within the university context. University mental health services should also provide clear avenues for access to treatment for students with a broad range of mental health problems, of all severities and ensure effective collaboration with external services to ensure that all students are in receipt of appropriate packages of integrated care.

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Appendices

Appendix 2.1: Search Strategy

Original search

Name of database	Date of search from	Date of search to	Records retrieved
MEDLINE	1946	01/11/2018	2711
PsycINFO	1806	01/11/2018	2261
Embase	1974	02/11/2018	842
CENTRAL	All years	02/11/2018	1905
ERIC	1981	20/11/2018	1378
		Total	9097
		De-duplicated	7250

Update search

Name of database	Date of search from	Date of search to	Records retrieved
MEDLINE	01/11/2018	22/07/2019	516
PsycINFO	01/11/2018	22/07/2019	302
Embase	01/11/2018	22/07/2019	210
CENTRAL	01/11/2018	22/07/2019	422
ERIC	01/11/2018	22/07/2019	75
		Total	1526
		De-duplicated	926

MEDLINE

1. Controlled clinical trial.pt
2. Randomized controlled trial.pt
3. (randomi#ed or randomi#ation or randomi#ing).ti,ab,kf.
4. (RCT or "at random" or (random* adj3 (administ* or allocat* or assign* or class* or control* or determine* or divide* or division or distribut* or expose* or fashion or number* or place* or recruit* or split or substitut* or treat*))).ti,ab,kf.
5. Placebo*.ab,ti,kf.
6. Trial.ab,ti,kf.
7. ((single or double or triple or treble) adj2 (blind* or mask* or dummy)).ti,ab,kf.
8. double-blind method/ or random allocation/ or single-blind method/
9. ((crossover* or cross-over*) adj3 (random* or trial or study or control* or group?)).ti,ab,kf.

10. (group? adj3 (random* or administ* or allocat* or assign* or control* or divide* or division or distribut* or place* or split or substitut* or treat*)).ti,ab,kf.
11. (control* and (waitlist* or wait* list* or ((treatment or care) adj2 usual))).ti,ab,kf,hw.
12. Or/1-11
13. (systematic or structured or evidence or trials or studies).ti. and ((review or overview or look or examination or update* or summary).ti. or review.pt.)
14. meta-analysis.pt. or (meta-analys* or meta analys* or metaanalys* or meta synth* or meta-synth* or metasynth*).ti,ab,kf,hw.
15. ((systematic or meta) adj2 (analys* or review)).ti,kf. or ((systematic* or quantitativ* or methodologic*) adj5 (review* or overview*)).ti,ab,kf,sh. or (quantitativ$ adj5 synthesis$).ti,ab,kf,hw.
16. (integrative research review* or research integration).tw. or scoping review?.ti,kf. or (review.ti,kf,pt. and (trials as topic or studies as topic).hw.) or (evidence adj3 review*).ti,ab,kf.
17. review.pt. and ((medline or medlars or embase or pubmed or scisearch or psychinfo or psycinfo or psychlit or psyclit or cinahl or electronic database* or bibliographic database* or computeri#ed database* or online database* or pooling or pooled or mantel haenszel or peto or dersimonian or der simonian or fixed effect or ((hand adj2 search*) or (manual* adj2 search*))).tw,hw. or (retraction of publication or retracted publication).pt.
18. or/13-17
19. 12 or 18

20. (undergraduate* or under-graduate* or postgraduate* or post-graduate* or ((college or university) adj3 student* or men or women)).ti,kf,hw,ab.
21. students/ or students, dental/ or students, medical/ or students, nursing/ or students, pharmacy/ or students, premedical/ or students, public health/
22. ((higher or tertiary) adj2 education).ti,kf.
23. 20 or 21or 22

24. "Feeding and eating disorders of childhood"/ or anorexia nervosa/ or bulimia nervosa/ or hyperphagia/ or pica/
25. Binge-eating disorder/ not obes*.ti.
26. eating disorder* or EDNOS or anorexi* or orthorexi* or bulimi* or diabulimi* or ((binge and (eat* or purg*)) not (obes* or metabolic syndrome)).ti,kf.
27. suicide, attempted/ or self-injurious behaviour/ or self mutilation/ or suicide/
28. Suicidal ideation/ or Crisis intervention/
29. Mood disorders/
30. Depressive disorder, major/ or dysthymic disorder/ or depressive disorder, treatment-resistant/ or depressive disorder/
31. Seasonal affective disorder/
32. Anxiety disorders/ or anxiety, castration/ or obsessive-compulsive disorder/ or panic disorder/ or stress disorders, traumatic, acute/
33. Exp Phobic disorders/ or agoraphobia/ or phobia, social/
34. Adjustment disorders/
35. social adjustment/

36. stress, psychological/
37. Anxiety/ or performance anxiety/ or test anxiety/
38. panic disorder/
39. Somatoform disorders/ or body dysmorphic disorders/ or hypochondriasis/ or neurasthenia/
40. Conversion disorder/
41. Obsessive-compulsive disorder/
42. Trichotillomania/
43. ((self adj (injur* or mutilat*)) or suicide* or suicidal or parasuicid* or para-suicid* or mood disorder* or affective disorder* or cyclothymi* or depression or depressive or dysthymi* or neurotic or neurosis or adjustment disorder* or anxiety disorder* or anxious or EDNOS or health anxiety or agoraphobia or obsess* or compulsi* or panic or phobi* or ptsd or posttrauma* or post trauma* or somatoform or somati#ation or medical* unexplained or body dysmorphi* or conversion disorder or hypochondria* or trichotillomania or anhedonia* or affective symptoms or ((mental* or psychologic*) adj (health or well*))).ti,kf.
44. (mental or psychiatri* or psycholog*) adj3 (illness* or health disorder* or disorder* or problem*)).ti,ab,kf.
45. Mental health adj2 (difficult* or problem*).ti,ab,kf.

46. (oppositional adj3 (defian* or disorder?)).ti,kf.
47. Conduct disorder/
48. Personality disorders/ or borderline personality disorder/
49. ((conduct or behave* or antisocial or anti-social or dyssocial or emotional* or internali#ing or externali#ing) adj1 (problem? or difficult* or psychopath*)).ti,kf.
50. ((conduct or behave* or personalit*) adj1 (aggressi* or agressi* or antisocial or anti-social or dyssocial or defian* or delinquen* or disturb* or disrupt* or internali#ing or externali#ing or problem*)).ti,kf.
51. ((substance adj1 ("use" or abuse)) or binge-drinking).mp. or binge drinking.ti,ab.
52. Exp alcohol-related disorders/ or exp substance-related disorders/
53. (or/24-52)
54. 19 and 23 and 53

55. (health promotion not (health promotion and treat*)).ti.
56. Smoking cessation/ or exp tobacco smoking/
57. Condoms/ or safe sex/ or exp sexually transmitted diseases/
58. Unsafe sex/
59. (sex* adj (health or behave* or risk)).ti.
60. (Smoking or tobacco or nicotine).ti.
61. Or/55-60
62. 54 not 61

PsychINFO

1. (randomi#ed or randomi#ation or randomi#ing).ti,ab,id.
2. (RCT or "at random" or (random* adj3 (assign* or allocat* or control* or crossover or cross-over or design* or divide* or division or number))).ti,ab,id.
3. ((control* adj2 (trial or study or group)) and (placebo or waitlist or wait* list* or ((treatment or care) adj2 usual) or (no intervention* or non intervention* or non-intervention* or without any intervention*))).ti,ab,id,hw.
4. ((single or double or triple or treble) adj2 (blind* or mask* or dummy)).ti,ab,id.
5. treatment outcome.md. and "3300".cc.
6. 1 or 2 or 3 or 4 or 5

7. *(literature review or meta analysis or metasynthesis or systematic review).md,sh.*
8. *((systematic* adj2 review*) or meta-analys* or metasynthes* or meta-synthes* or ((literature or scoping) adj2 review?).ti,id.*
9. *7 or 8*
10. *6 or 9*

11. (student* or undergraduate* or under-graduate* or postgraduate* or post-graduate* or ((college or university) adj3 (student* or women or men)).ti,id,hw,ab.
12. GRADUATE STUDENTS/ or DENTAL STUDENTS/ or NURSING STUDENTS/ or MEDICAL STUDENTS/ or EDUCATION STUDENTS/ or POSTGRADUATE STUDENTS/ or BUSINESS STUDENTS/ or LAW STUDENTS/ or COLLEGE STUDENTS/
13. ((higher or tertiary) adj2 education).ti,id.
14. 11 or 12 or 13
15. 10 and 14

16. eating disorders/ or anorexia nervosa/ or bulimia/ or hyperphagia/ or pica/ or "purging (eating disorders)"/
17. binge eating/ not obes*.ti.
18. eating disorder* or EDNOS or anorexi* or orthorexi* or bulimi* or diabulimi* or ((binge and (eat* or purg*)) not (obes* or metabolic syndrome))).ti,id.
19. Self destructive behaviour/ or attempted suicide/ or self inflicted wounds/ or self injurious behaviour/ or self mutilation/ or suicide/
20. Suicide prevention/
21. Suicidal ideation/
22. Affective disorders/

23. Major depression/ or dysthymic disorder/ or endogenous depression/ or reactive depression/ or recurrent depression/ or treatment resistant depression/
24. Atypical depression/
25. "depresson (emotion)"/
26. Seasonal effective disorder/
27. Anxiety disorders/ or acute stress disorder/ or castration anxiety/ or death anxiety/ or generalized anxiety disorder/ or obsessive compulsive disorder/ or panic disorder/ or posttraumatic stress disorder/ or separation anxiety/
28. Phobias/ or acrophobia/ or agoraphobia/ or claustrophobia/ or ophidiophobia/ or social phobia/
29. "debriefing (psychological)"/
30. Adjustment disorders/
31. Coping behaviour/
32. Emotional trauma/
33. Adjustment/ or exp emotional adjustment/ or occupational adjustment/ or school adjustment/ or social adjustment/
34. Chronic stress/ or environmental stress/ or psychological stress/ or social stress/ or stress reactions/
35. Anxiety/ or computer anxiety/ or mathematics anxiety/ or performance anxiety/ or social anxiety/ or speech anxiety/ or test anxiety/
36. Panic attack/ or panic/ or panic disorder/
37. Somatoform disorders/ or body dismorphic disorder/ or hypochondriasis/ or neurasthenia/ or somatization disorder/ or somatoform pain disorder/
38. Conversion disorder/ or hysterical paralysis/ or hysterical vision disturbances/ or pseudocyesis/
39. Somatization/
40. Compulsions/ or repetition compulsion/
41. Obsessions/
42. Obsessive compulsive personality disorder/
43. Trichotillomania/
44. Neurosis/ or traumatic neurosis/
45. ((self adj (injur* or mutilat*)) or suicid* or suicidal or parasuicid* or para-suicid* or mood disorder* or affective disorder* or cyclothymi* or depression or depressive or dysthymi* or neurotic or neurosis or adjustment disorder* or anxiety disorder* or anxious or EDNOS or health anxiety or agoraphobia or obsess* or compulsi* or panic or phobi* or ptsd or posttrauma* or post trauma* or somatoform or somati#ation or medical* unexplained or body dysmorphi* or conversion disorder or hypochondria* or trichotillomania or anhedonia* or affective symptoms or ((mental* or psychologic*) adj (health or well*))).ti,ab,id.
46. (mental or psychiatri* or psycholog*) adj3 (illness* or health disorder* or disorder* or problem*).ti,ab,id.
47. mental health adj2 (difficult* or problem*).ti,ab,id

48. (oppositional adj3 (defian* or disorder?)).ti,id.
49. Conduct disorder/ or explosive disorder/

50. Personality disorders/ or borderline personality disorder/
51. ((conduct or behav* or antisocial or anti-social or dyssocial or emotional* or internali#ing or externali#ing) adj1 (problem? or difficult* or psychopath*)).ti,id.
52. ((conduct or behave* or personalit*) adj1 (aggressi* or agressi* or antisocial or anti-social or dyssocial or defian* or delinquen* or disturb* or disrupt* or internali#ing or externali#ing or problem*)).ti,id.
53. (substance adj ("use" or abuse)).ti.
54. Exp alcoholism/ or alcohol abuse/ or exp binge drinking/ or alcohol intoxication/ or alcohol withdrawal/
55. (or/16-54)
56. 14 and 55

57. (health promotion not (health promotion and treat*)).ti.
58. Smoking cessation/ or exp tobacco smoking/
59. Condoms/ or safe sex/ or exp sexually transmitted diseases/
60. Exp sexual risk taking
61. (sex* adj (health or behave* or risk)).ti.
62. Smoking or tobacco or nicotine).ti.
63. Or/57-62
64. 56 not 63

Cochrane Library –CENTRAL

1. MeSH descriptor: [Feeding and Eating Disorders] this term only
2. MeSH descriptor: [Anorexia Nervosa] this term only
3. MeSH descriptor: [Bulimia Nervosa] this term only
4. MeSH descriptor: [Binge-Eating Disorder] this term only
5. MeSH descriptor: [Bulimia] this term only
6. ("eating disorder*" or ` (eat* near/3 mood*) or EDNOS or anorexi* or orthorexi* or bulimi* or diabulimi* or (bing* near/2 (eat* or purg*))):ti,ab,kw
7. MeSH descriptor: [Mood Disorders] this term only
8. MeSH descriptor: [Depressive Disorder] this term only
9. MeSH descriptor: [Depressive Disorder, Major] this term only
10. MeSH descriptor: [Seasonal Affective Disorder] this term only
11. MeSH descriptor: [Dysthymic Disorder] this term only
12. MeSH descriptor: [Depression] this term only
13. (mood* or depress* or dysthymi* or "affective disorder*" or "affective symptom*"):ti,ab,kw
14. MeSH descriptor: [Anxiety Disorders] explode all trees
15. (general* near/2 anxi*):ti,ab,kw
16. anxiety:ti
17. ("anxiety disorder*" or "social* anxiety" or phobi* or agoraphobi* or ADNOS or "health anxiety" or hypochondri* or anxious or obsess* or compulsi* or panic or PTSD or "post traumatic stress" or "posttraumatic stress" or "stress disorder*" or ((acute or chronic) near/2 stress*) or neurosis or neuroses or neurotic):ti,ab,kw
18. ((psychological or emotional) near/2 (debrief* or stress* or trauma*)):ti,kw
19. MeSH descriptor: [Adjustment Disorders] explode all trees

20. MeSH descriptor: [Disruptive, Impulse Control, and Conduct Disorders] explode all trees
21. trichotillomani* or ((addicti* or impuls* or compulsi*) near/2 (behavi* or disorder*))):ti,ab,kw
22. MeSH descriptor: [Obsessive Behavior] this term only
23. MeSH descriptor: [Self-Injurious Behavior] explode all trees
24. ((self next (injur* or mutilat*)) or suicide* or suicidal or parasuicid* or para-suicid*):ti,ab,kw
25. MeSH descriptor: [Somatoform Disorders] explode all trees
26. (somatoform or somatization or somatisation or "medical* unexplained" or MUPS or "body dysmorphi*"):ti,ab,kw
27. MeSH descriptor: [Conduct Disorder] this term only
28. (oppositional near/3 (defian* or disorder*)):ti,ab,kw
29. ((conduct or behavi* or antisocial or anti-social or dyssocial or emotional* or internalizing or internalising or externalizing or externalising) near/2 (disorder* or problem* or difficult* or disturb* or psychopath*)):ti,ab,kw
30. ((conduct or behavi* or personalit*) near/2 (aggressi* or agressi* or antisocial or anti-social or dyssocial or defian* or deliquen* or disturb* or disrupt* or

internalizing or internalising or externalizing or externalising or problem*)):ti,ab,kw

31. MeSH descriptor: [Personality Disorders] explode all trees
32. (BPD or personality disorder*):ti,ab,kw
33. MeSH descriptor: [Substance-Related Disorders] explode all trees
34. addict*:ti,kw
35. ((alcohol or drug* or substance) near/2 (abus* or misus* or use or user* or depend* or disorder)):ti,ab,kw
36. ((addict* or dependen* or abuse or abuser or misuse*) near (adinazolam or aerosol* or alcohol* or alprazolam or amphetamin* or anthramycin or anxiolytic* or ativan or barbituat* or bentazepam or benzodiazepin* or bromazepan or brotizolam or buprenorphin* or camazepam or cannabi* or chlordiazepoxid* or cinolazepam or clobazam or clonazepam or clorazepam or clotiazepam or cloxazolam or cocaine* or codeine or crack or crystal or cyprazepam or depressant* or diacetylmorphin* or diazepam* or doxefazepam or ecstasy or estazolam or etizolam or fentanyl or flunitrazepam or flurazepam or flutazoram or flutoprazepam or fosazepam or gases or GHB or girisopam or halazepam or hallucinogen* or haloxazepam or heroin* or hydromorphone or hydroquinone or hypnotic* or inhalant* or ketamin* or ketazolam or librium or loflazepate or loprazolam or lorazepam or lormetazepam or LSD or marihuana* or marijuana* or MDMA or meclonazepam or medazepam or meperidine or mephedrone or mescalin* or metaclazepam or methadone or methamphetamin* or methaqualone or mexazolam or midazepam or midazolam or morphine* or narcotic* or nerisopam or nimetazepam or nitrazepam or nitrites or "nitrous oxide" or "n-methyl-3,4-methylenedioxyamphetamine" or nordazepam or opiate* or opiod* or opium or oxazepam or oxazolam or oxazypam or oxycodone or oxzepam or painkiller* or "pain killer*" or PCP or pethidin* or phencyclidin* or pinasepam or prazepam or propazepam or propoxyphene or psilocybin or psychedelic* or psychoactive* or psychostimulant* or quinazolinone or ripazepam or ritalin or sedative* or serazepin* or solvent* or steroid* or stimulant* or temazepam or tetrazepam or tofisopam or tramadol or triazolam or triflubazam or valium or vicodin)):ti,ab
37. (("legal high*" or recreational or party or illicit*) next (drug* or substance*)):ti,ab,kw (Word variations have been searched)
38. #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26 or #27 or #28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36 or #37 or #37
39. (undergraduate* or under-graduate* or postgraduate* or post-graduate* or ((college or university) near/3 student* or women or men)):ti,ab,kw
40. #38 and #39

Embase

1. (randomi#ed or randomi#ation or randomi#ing).ti,ab,kw.
2. (RCT or "at random" or (random* adj3 (assign* or allocat* or control* or crossover or cross-over or design* or divide* or division or number))).ti,ab,kw.
3. ((control* adj2 (trial or study or group)) and (placebo or waitlist or wait* list* or ((treatment or care) adj2 usual) or (no intervention* or non intervention* or non-intervention* or without any intervention*))).ti,ab,kw,hw.
4. ((single or double or triple or treble) adj2 (blind* or mask* or dummy)).ti,ab,kw.
5. 1 or 2 or 3 or 4

6. (student* or undergraduate* or under-graduate* or postgraduate* or post-graduate* or ((college or university) adj3 (student* or women or men)).ti,kw,hw,ab.
7. exp PhD student/ or exp dental student/ or exp postgraduate student/ or exp nursing student/ or exp physical therapy student/ or exp graduate nursing student/ or exp medical student/ or exp non-medical student/ or exp undergraduate student/ or student/ or exp university student/ or exp midwifery student/ or exp male nursing student/ or exp graduate student/ or exp premedical student/ or exp college student/
8. ((higher or tertiary) adj2 education).ti,kw.
9. 6 or 7 or 8
10. 5 and 9

11. eating disorder/ or anorexia nervosa/ or bulimia/ or pica/
12. binge eating disorder/ not obes*.ti.
13. eating disorder* or EDNOS or anorexi* or orthorexi* or bulimi* or diabulimi* or ((binge and (eat* or purg*)) not (obes* or metabolic syndrome)).ti,kw.
14. suicide/ or suicide attempt/ or suicidal ideation/ Suicide prevention/
15. mood disorder/
16. depression/ or adolescent depression/ or atypical depression/ or chronic depression/ or dysthymia/ or endogenous depression/ or major depression/ or reactive depression/ or seasonal affective disorder/
17. anxiety disorder/ or anxiety neurosis/ or cardiac anxiety/ or generalized anxiety disorder/ or exp obsessive compulsive disorder/ or panic/ or exp phobia/ or posttraumatic stress disorder/ or separation anxiety/ or exp anxiety/
18. Adjustment disorder/
19. Coping behaviour/
20. psychotrauma/
21. Adjustment/
22. chronic stress/ or emotional stress/ or interpersonal stress/ or mental stress/
23. Panic/
24. somatoform disorder/ or body dysmorphic disorder/ or hypochondriasis/ or somatic delusion/ or somatization/
25. Conversion disorder/

26. Compulsion/
27. Obsession/
28. compulsive personality disorder/
29. Trichotillomania/
30. Neurosis/ or affective neurosis/ or anxiety neurosis/
31. ((self adj (injur* or mutilat*)) or suicid* or suicidal or parasuicid* or para-suicid* or mood disorder* or affective disorder* or cyclothymi* or depression or depressive or dysthymi* or neurotic or neurosis or adjustment disorder* or anxiety disorder* or anxious or EDNOS or health anxiety or agoraphobia or obsess* or compulsi* or panic or phobi* or ptsd or posttrauma* or post trauma* or somatoform or somati#ation or medical* unexplained or body dysmorphi* or conversion disorder or hypochondria* or trichotillomania or anhedonia* or affective symptoms or ((mental* or psychologic*) adj (health or well*))).ti,ab,kw.
32. (mental or psychiatri* or psycholog*) adj3 (illness* or health disorder* or disorder* or problem*).ti,ab,kw.
33. mental health adj2 (difficult* or problem*).ti,ab,kw

34. (oppositional adj3 (defian* or disorder?)).ti,kw.
35. Conduct disorder/
36. Personality disorder/
37. ((conduct or behav* or antisocial or anti-social or dyssocial or emotional* or internali#ing or externali#ing) adj1 (problem? or difficult* or psychopath*)).ti,kw.
38. ((conduct or behave* or personalit*) adj1 (aggressi* or agressi* or antisocial or anti-social or dyssocial or defian* or delinquen* or disturb* or disrupt* or internali#ing or externali#ing or problem*)).ti,kw.
39. (substance adj ("use" or abuse)).ti.
40. Exp alcoholism/ or alcohol abuse/ or binge drinking/ or college drinking/
41. (or/11-40)
42. 10 and 41

43. (health promotion not (health promotion and treat*)).ti.
44. Smoking cessation/ or smoking/
45. Condom/ or "condom use"/ or safe sex/ or exp sexually transmitted disease/
46. (sex* adj (health or behave* or risk)).ti.
47. Smoking or tobacco or nicotine.ti.
48. Or/43-47
49. 42 not 48

50. ((university or college) adj (psychologists or counsellors)).ti,kf,ab.

51. ((Psychotherapy or ((cognitive or behavi*) adj2 therapy*) or CBT) and (treat* or intervention or effect? or efficacy or effectiveness or compar* or versus)).ti,ab.
52. exp psychotherapy/ or exp psychodynamic psychotherapy/ or exp short term psychotherapy/
53. 50 or 51 or 52
54. 49 and 53

ERIC EBSCO

1. DE "Eating Disorders"
2. ("eating disorder*" or ` (eat* N3 mood*) or EDNOS or anorexi* or orthorexi* or bulimi* or diabulimi* or (bing* N3 eat*) or (bing N3 purg*))
3. DE "Depression (Psychology)"
4. mood* or depress* or dysthymi* or "affective disorder*" or "affective symptom*"
5. DE "Separation Anxiety" OR DE "Fear" OR DE "Posttraumatic Stress Disorder"
6. DE "Anxiety Disorders"
7. DE "Anxiety"
8. ((adolesc* or general*) N2 anxi*)
9. TI anxiety
10. ("anxiety disorder*" or "social* anxiety" or phobi* or agoraphobi* or ADNOS or "health anxiety" or hypochondri* or obsess* or compulsi* or panic or PTSD or "post traumatic stress" or "posttraumatic stress" or "stress disorder*" or neurosis or neuroses or neurotic)
11. ((acute or chronic) N2 stress*)
12. ((psychological or emotional) N2 (debrief* or stress* or trauma*))
13. DE "Adjustment (to Environment)" OR DE "Social Adjustment"
14. ((mental* or psychologic*) N2 (health or well*))
15. ((psychologic* or social) N2 (adapt* or adjust*))
16. DE "Self Destructive Behavior"
17. ((addicti* or impuls* or compulsi*) N2 (behavi* or disorder*))
18. DE "Suicide"
19. "self injur*" or "self mutilat*" or suicide* or suicidal or parasuicid* or para-suicid*
20. (somatoform or somatization or somatisation or "medical* unexplained" or MUPS or "body dysmorphi*")
21. (oppositional N3 (defian* or disorder*))
22. ((conduct or behavi* or antisocial or anti-social or dyssocial or emotional* or internalizing or internalising or externalizing or externalising) N2 (disorder* or problem* or difficult* or disturb* or psychopath*))
23. ((conduct or behavi* or personalit*) N2 (aggressi* or agressi* or antisocial or anti-social or dyssocial or defian* or deliquen* or disturb* or disrupt* or internalizing or internalising or externalizing or externalising or problem*))
24. DE "Personality Problems"
25. "personality disorder*"
26. DE "Substance Abuse" OR DE "Alcohol Abuse" OR DE "Drug Abuse" OR DE "Addictive Behavior"
27. TI addict*
28. ((alcohol or drug* or substance) N2 (abus* or misus* or use or user* or depend* or disorder))
29. ((addict* or dependen* or abuse or abuser or misuse*) N2 (aerosol* or alcohol* or amphetamin* or cannabi* or cocaine* or codeine or ecstasy or gases or GHB or heroin* or LSD or marihuana* or marijuana* or MDMA or methadone or methamphetamin* or morphine* or narcotic* or opiate* or opiod* or opium or psilocybin or psychedelic* or psychoactive* or psychostimulant* or solvent* or steroid* or stimulant*))
30. DE "At Risk Persons" OR DE "At Risk Students"
31. (((accident or emergency) N2 (department or ward))) AND ((drinking or alcohol or drugs or crime or violence)) AND brief
32. DE "university students" or DE "college students" or DE "undergraduate students"

33. DE "higher education" or DE college or DE university or DE "post secondary" or DE postsecondary
34. (student* or undergraduate* or under-graduate* or postgraduate* or post-graduate* or ((college or university) N3 (student* or women or men))
35. ((higher or tertiary) N2 education)
36. (randomi#ed or randomi#ation or randomi#ing)
37. (RCT or "at random" or (random* N3 (assign* or allocat* or control* or crossover or cross-over or design* or divide* or division or number)))
38. ((single or double) N1 blind*)
39. ((control* N2 (trial or study or group)) and (placebo or waitlist* or wait* list* or ((treatment or care) N2 usual) or ("no intervention*" or "non intervention*" or non-intervention* or "without any intervention*")))
40. (ZT "journal article*") or (ZT "article")
41. (S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31)
42. S32 OR S33 OR S34 OR S35
43. S36 OR S37 OR S38 OR S39
44. S40 AND S41 AND S42 AND S43

Appendix 2.2a: Additional characteristics of included studies

Study ID	Country	Sample Size	Diagnosis	Intervention Type	Student Status	Age Mean (Range)	Gender (% female)	Ethnicity
Akillas 1995	NR	47	Anxiety-Social	Treatment	Undergraduate	22.53 (18-41)	0	NR
Allan 2015	USA	82	PTSD	Indicated	Undergraduate	18.84 (18-28)	82.9	84% White 6% African American 5% Asian 2% Other
Anderson 2010 ≠	USA	28	PTSD	Indicated	Student unspecified	19.30 (NR)	100	86% White
Bowler 2017 ≠	UK	97	Anxiety-Generalised	Selective	First year undergraduate	18.90 (NR)	69.07	NR
Bucchianeri 2012 ≠	USA	86	Eating Disorder	Indicated	Undergraduate	19.20 (NR)	100	67% European American 14% Latina 5% Asian American 1% African American 13% Other/Mixed race
Callinan 2015 ≠	UK	60	PTSD	Indicated	Student unspecified	20.20 (18-28)	80	NR
Clore 2006 ≠	USA	30	Depression	Indicated	Undergraduate	21.33 (NR)	73	90% Euro-American
Diaz-Ferrer 2017	Spain	35	Eating Disorder	Indicated	Student unspecified	19.85 (18-30)	100	NR
Ellis 2011	Australia	39	Anxiety, Depression	Indicated	Undergraduate	19.67 (18-25)	77	NR

Study ID	Country	Sample Size	Diagnosis	Intervention Type	Student Status	Age Mean (Range)	Gender (% female)	Ethnicity
Ezegbe 2019	Nigeria	55	Depression	Indicated	Student Unspecified	20.93 (NR)	63.64	NR
Falsafi 2016	USA	90	Anxiety, Depression	Treatment	Undergraduate	22.10 (18-50)	86.4	90% White
Fawcett 2019	Canada	41	Anxiety, Depression	Indicated	Undergraduate	22.29 (17-41)	73.17	NR
Fitzpatrick 2017	USA	70	Anxiety, Depression	Selective	Student unspecified	22.20 (NR)	81.03	79% Caucasian 7% Asian 9% Mixed Race 2% African American 2% Native American
Franko 2005	USA	240	Eating Disorder	Indicated	First year undergraduate	18.20 (18-22)	100	73% White 7% Asian 11% Black 3% Latino/Hispanic 6% Other
Fukumori 2017*	Japan	22	Self Harm	Indicated	Student unspecified	19.40 (18-22)	68.18	NR
Gardenswartz & Craske 2001	USA	121	Anxiety-Panic	Indicated	Student unspecified	20.30 (18-39)	68.6	39% Caucasian 30% Asian American 11% Hispanic 6% African American 11% Other

Study ID	Country	Sample Size	Diagnosis	Intervention Type	Student Status	Age Mean (Range)	Gender (% female)	Ethnicity
Gawrysiak 2009	USA	30	Depression	Indicated	Student unspecified	18.40 (18-NR)	80	70% Caucasian 13% African American 7% Latino 7% Asian American 3% Other
Geisner 2006	USA	177	Depression	Indicated	Undergraduate	19.28 (18-NR)	70	49% Caucasian 48% Asian 3% Other
Geisner 2015	USA	339	Depression	Indicated	Student unspecified	20.14 (18-24)	62.4	60% Caucasian 19% Asian or Pacific Islander 1% Black or African American 8% Multiracial <1% Native American
Gortner 2006	USA	97	Depression	Selective	Student unspecified	19.00 (18-36)	72	78% Anglo origin 8% Asian/Asian-American/Pacific Islander 12% Latino/Hispanic 2% Other
Grassi 2009	Italy	120	Anxiety-Generalised	Selective	Student unspecified	23.00 (20-25)	50	NR
Guo 2017	China	76	Depression	Indicated	Undergraduate	20.39 (NR)	94.9	NR

Study ID	Country	Sample Size	Diagnosis	Intervention Type	Student Status	Age Mean (Range)	Gender (% female)	Ethnicity
Haddock 2017	USA	37	Depression	Indicated	Student unspecified	20.42 (18-27)	100	81% Caucasian 6% American Indian/Hispanic 3% Asian American/Pacific Islander 3% Other
Hamamci 2006	Turkey	31	Depression	Indicated	Undergraduate	19.52 (NR)	48.38	NR
Hamdan-Mansour 2009	Jordan	84	Depression	Indicated	Undergraduate	NR (17-24)	45	NR
Hutchings 1980	USA	70	Anxiety-Generalised	Indicated	Student unspecified	NR	68.57	NR
Kaminski 1996	USA	29	Eating Disorder	Indicated	Undergraduate	18.30 (NR)	100	92% White 4% Latina 4% Asian American
Kang 2009	South Korea	32	Anxiety, Depression	Selective	Undergraduate	22.47 (NR)	100	NR
Kanji 2006	UK	93	Anxiety-Generalised	Selective	Undergraduate	NR (19-49)	90.32	NR
Kass 2014	USA	151	Eating Disorder	Indicated	Student unspecified	21.00 (18-25)	100	60% White 9% Black/African American 7% Chinese 7% Hispanic/Latina
Kenardy 2003	Australia	83	Anxiety-Generalised	Indicated	First year undergraduate	19.92 (17-51)	68.4	NR

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Study ID	Country	Sample Size	Diagnosis	Intervention Type	Student Status	Age Mean (Range)	Gender (% female)	Ethnicity
Khumar 1993	India	50	Depression	treatment	Postgraduate	NR (20-25)	100	NR
Kovac 2002	USA	121	Self-harm-suicide	Indicated	Undergraduate	23.12 (18-42)	72.73	74% White 22% African American 3% Other
Kovac 2002 ≠	USA	121	Self-harm-suicide	Indicated	Undergraduate	23.12 (18-42)	72.73	74% White 22% African American 3% Other
LaFreniere 2016	USA	51	Anxiety-Generalised	Treatment	Undergraduate	NR (18-NR)	84.31	77% White 8% Asian 6% Black 4% Hispanic 2% Middle Eastern 4% Other
Lange 2001	The Netherlands	25	PTSD	Indicated	Student unspecified	22.00 (18-37)	64	NR
Lee 2013	South Korea	23	Anxiety-Social	Treatment	Student unspecified	23.23 (NR)	52.17	NR
Levin 2017	USA	79	Anxiety, Depression	Selective	Student unspecified	20.51 (18-NR)	66	88% White 3% Asian 3% Hispanic 3% Multiracial 1% African American 1% Native Hawaiian or other

Study ID	Country	Sample Size	Diagnosis	Intervention Type	Student Status	Age Mean (Range)	Gender (% female)	Ethnicity
								pacific islander 14% Hispanic/Latino
Littleton 2016	USA	87	PTSD	Treatment	Student unspecified	22.00 (18-42)	100	46% White/European American 25% Black/African American 7% Asian/Asian American 1% Native American 14% Multi-ethnic
Mastikhina 2017 ≠	Canada	45	Depression	Indicated	Undergraduate	20.00 (NR)	86.7	48% Caucasian
McCall 2018	Canada	101	Anxiety-Social	Indicated	Student unspecified	21.86 (17-46)	72	18% White 62% Asian 20% Other
McIndoo 2016	USA	50	Depression	Indicated	Student unspecified	19.20 (NR)	62	76% Caucasian 10% Mixed Race 4% Black/African American 4% Asian American 4% Indian/Middle Eastern 2% Hispanic
McMakin 2011 ≠	USA	27	Depression	Indicated	Undergraduate	NR	NR	78% Caucasian 11% Latina 7% Asian

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Study ID	Country	Sample Size	Diagnosis	Intervention Type	Student Status	Age Mean (Range)	Gender (% female)	Ethnicity
								4% African American
Mogoase 2013	Romania	42	Depression	Indicated	Undergraduate	22.87 (NR)	95.23	NR
Mogoase 2013 ≠	Romania	42	Depression	Indicated	Undergraduate	22.87 (NR)	95.23	NR
Mohammadi 2011	Iran	28	Depression	Indicated	Student unspecified	20.12 (18-22)	100	NR
Moldovan 2013	Romania	96	Depression	Indicated	First year undergraduate	23.58 (NR)	87.5	NR
Noormohamadi 2019	Iran	30	Anxiety-Generalised	Selective	Student Unspecified	NR (18-28)	NR	NR
Norton 2016 ≠	Australia	60	Anxiety-Social	Treatment	First year undergraduate	20.83 (NR)	85	30% Asian
Pace 1993	USA	74	Depression	Indicated	Undergraduate	22.13 (NR)	78.38	NR
Peden 2000	USA	92	Depression	Indicated	Student unspecified	19.20 (18-34)	100	NR
Phimarn 2015	Thailand	68	Depression	Indicated	Student unspecified	19.95 (18-35)	35.29	NR
Rasanen 2016	Finland	68	Anxiety, Depression	Selected	Student unspecified	24.29 (19.32)	85.3	NR
Rezvan 2008	Iran	36	Anxiety-Generalised	Treatment	Undergraduate	20.30 (NR)	100	NR
Richards 2016	Ireland	137	Anxiety-Generalised	Indicated	Student unspecified	23.82 (17-58)	77	NR
Robatmili 2015	Iran	20	Depression	indicated	Student unspecified	NR	NR	NR

Study ID	Country	Sample Size	Diagnosis	Intervention Type	Student Status	Age Mean (Range)	Gender (% female)	Ethnicity
Rohde 2014	USA	82	Depression	Indicated	Undergraduate	19.00 (17-22)	69.5	81% Caucasian 11% Asian American 3% African American 5% Other
Rohde 2016	USA	59	Depression	Indicated	Student unspecified	21.80 (18-28)	68	70% Caucasian 9% Asian American 3% Hispanic 2% Native American 16% Other
Roushani 2016	Iran	32	Anxiety-Social	Indicated	Student unspecified	NR (20-35)	100	NR
Sadeghi 2016	Iran	46	Depression	treatment	Undergraduate	21.03 (NR)	21.74	NR
Sanchez-Ortiz 2011	UK	76	Eating Disorder	Treatment	Student unspecified	23.90 (NR)	NR	NR
Saravanan 2017	Malaysia	74	Depression	Indicated	First year undergraduate	20.38 (18-23)	9.3	8% Nigerian 5% Zimbabwe 5% Sudan 21% Iran 12% Iraq 7% Saudi Arabia 7% Sri Lanka 7% Pakistan 12% Egypt 2% Bangladesh 7% Jordan 9% Yemen

Study ID	Country	Sample Size	Diagnosis	Intervention Type	Student Status	Age Mean (Range)	Gender (% female)	Ethnicity
Schelver 1983	USA	45	Anxiety-Social	Indicated	Undergraduate	NR	NR	NR
Seligman 1999	USA	231	Depression	Indicated	First year undergraduate	NR	52	NR
Seligman 2007	USA	240	Depression	Indicated	First year undergraduate	NR	65	NR
Sethi 2010	Australia	38	Anxiety, Depression	Indicated	Undergraduate	19.47 (18-23)	65.79	NR
Sloan 2011	USA	47	PTSD	Treatment	Undergraduate	18.90 (NR)	NR	57% Caucasian 21% African American 9% Hispanic 7% Asian American 5% Other
Song 2015	South Korea	50	Anxiety, Depression	Selective	Undergraduate	19.55 (NR)	81.82	NR
Stallman 2016*	Australia	107	Anxiety, Depression	Indicated	Student unspecified	23.00 (17-48)	92	NR
Stefan 2018	Romania	71	Anxiety-Social	Indicated	Student Unspecified	18.92 (NR)	92.9	NR

Study ID	Country	Sample Size	Diagnosis	Intervention Type	Student Status	Age Mean (Range)	Gender (% female)	Ethnicity
Taylor 2006	USA	480	Eating Disorder	Indicated	Undergraduate	20.80 (17-31)	100	60% White 2% African American 10% Hispanic 17% Asian 11% Other
Taylor 2016	USA	206	Eating Disorder	Indicated	Student unspecified	20.00 (18-25)	100	51% Caucasian 11% African American 10% Hispanic 21% Asian/Asian American 7% Other
Timpano 2016 ≠	USA	104	Anxiety-OCD	Indicated	Undergraduate	18.90 (18-28)	83.7	81.7% Caucasian 8.7% African American 4.8% Asian American 4.8% Other
Torabizadeh 2016	Iran	150	Anxiety-Generalised	Indicated	Undergraduate	NR	66.7	NR
Uliaszek 2016	Canada	54	Anxiety, Depression	Indicated	Student unspecified	22.17 (18-46)	78	9% African America 37% Asian American 4% Multiracial 28% Caucasian 6% Hispanic 15% Other

Study ID	Country	Sample Size	Diagnosis	Intervention Type	Student Status	Age Mean (Range)	Gender (% female)	Ethnicity
Vasquez 2012	Spain	133	Depression	Indicated	Student unspecified	23.30 (NR)	82	NR
Vestre 1986	USA	81	Anxiety-Social	Indicated	Student unspecified	NR	71.6	NR
Walker 2014 ≠	USA	94	Depression	Indicated	Undergraduate	20.67 (18-25)	68.6	70% Caucasian 14% African American 12% Hispanic American 1% Asian American
Wells 2010*	USA	34	Depression	Indicated	Undergraduate	19.10 (NR)	70.59	NR
Wu 2002	Taiwan	24	Anxiety, Depression	Indicated	Undergraduate	NR (19-21)	50	NR
Xu 2019	China	101	Anxiety, Depression	Selective	First year undergraduate	19.79 (NR)	47.13	NR
Yang 2015	China	77	Depression	Indicated	Undergraduate	19.48 (NR)	68.52	NR
Yang 2018	China	74	Depression	Treatment	First year undergraduate	18.50 (16-21)	59.5	NR
Yao 2015 ≠	China	68	Anxiety-Social	Indicated	Student unspecified	20.46 (17-28)	60.13	NR
Ye 2017	China	27	Anxiety-Social	Treatment	First year undergraduate	25.08 (16-40)	37.03	11% Black African 55% White 11% Indian or Pakistani 7% other
Zabinski 2001	USA	62	Eating Disorder	Indicated	Undergraduate	19.30 (17-24)	100	66% Caucasian 27% Latina/Hispanic

Study ID	Country	Sample Size	Diagnosis	Intervention Type	Student Status	Age Mean (Range)	Gender (% female)	Ethnicity
								2%% Asian 5% Other
Zabinski 2004	USA	60	Eating Disorder	Indicated	Undergraduate	18.90 (17-33)	100	65% Caucasian 19% Latino 8% Asian/Pacific Islander 3% African American 5% Other
Zemestani 2016	Iran	45	Depression	Treatment	Undergraduate	24.20 (18-30)	60.98	NR

Note: NR = Not recorded

[a]Authors contacted, no data available. Included in attrition analysis only.

≠ Mechanistic studies not included in main meta-analysis

Appendix 2.2b: References of included studies:

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Indicated Interventions, Active comparisons
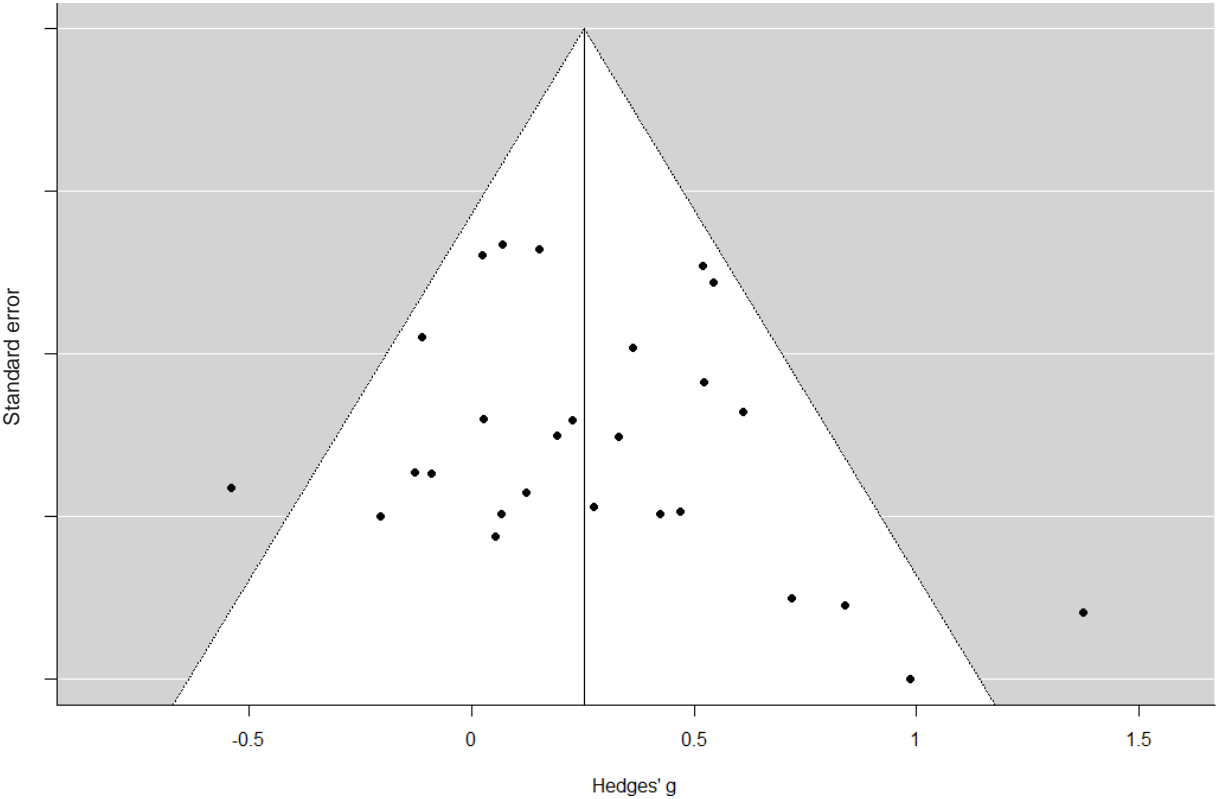
Indicated Interventions, Waitlist comparisons
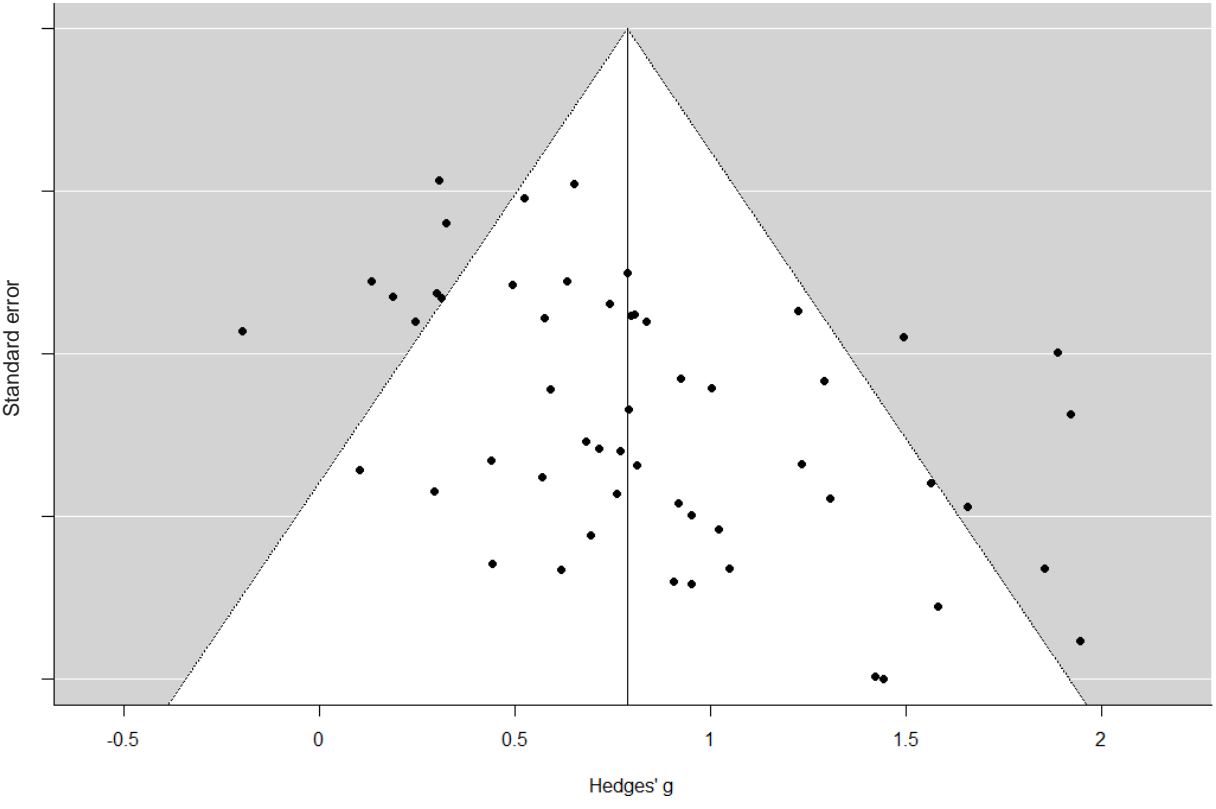
Selective Interventions, Active Comparisons
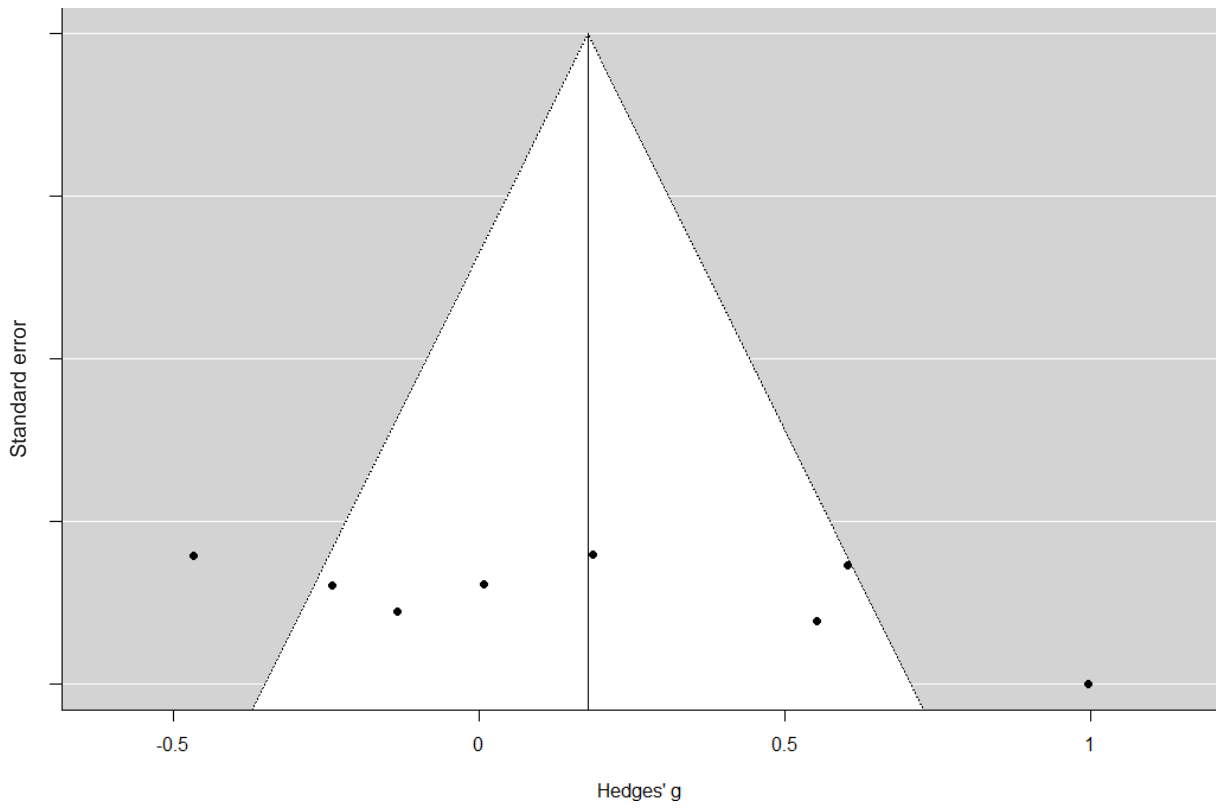
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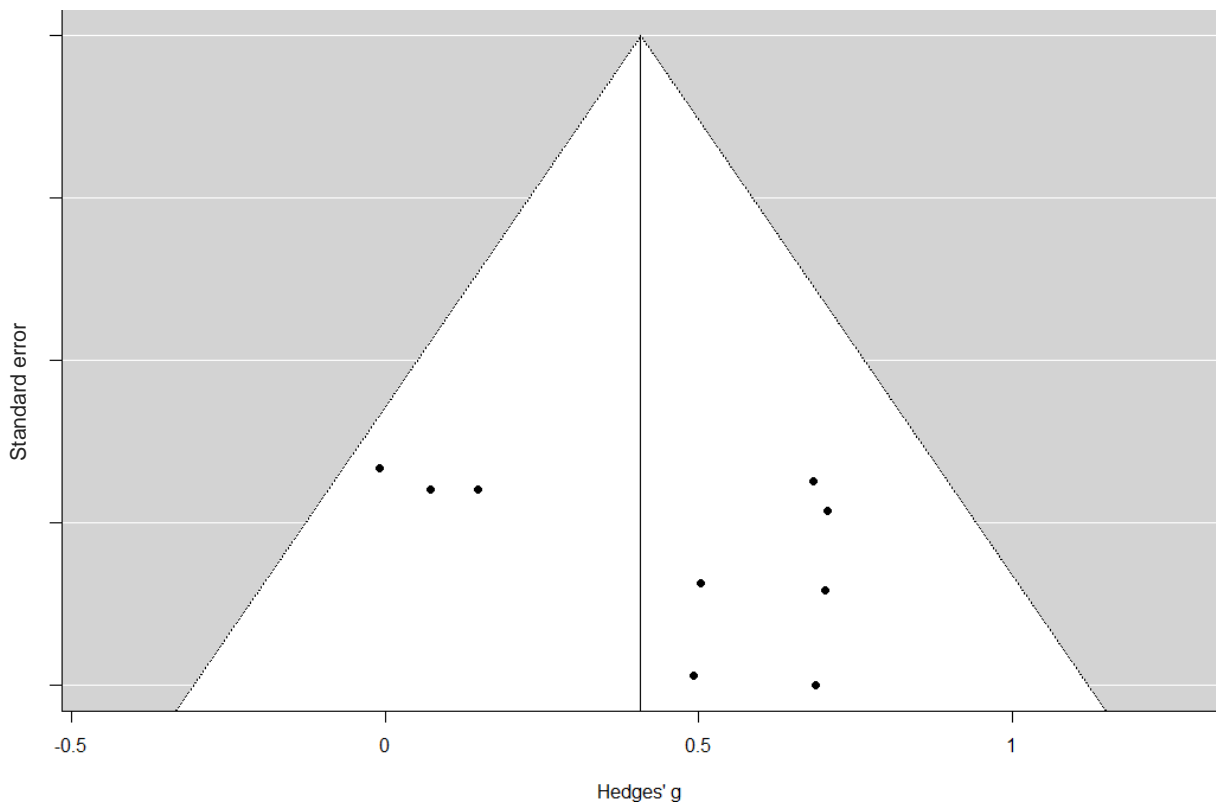
Appendix 2.4: Sensitivity analyses including additional studies with extreme effect sizes

Depression- Indicated treatments only.

Comparison	Timepoint	Sensitivity analysis[a]				Main Analysis			
		K (interventions)	Hedges' g (CI)	p	I^2	K (interventions)	Hedges' g (CI)	p	I^2
Active	End of Treatment	14 (15)	0.68 (0.31, 1.04)	.0003	88.30%	12 (13)	0.30 (0.14, 0.47)	.0003	38.18%
Waitlist/No intervention	End of Treatment	24 (30)	1.21 (0.92, 1.50)	<.0001	84.79%	21 (26)	0.87 (0.67, 1.07)	<.0001	66.52%
	1-3 month FU	9 (12)	1.35 (0.80, 1.90)	<.0001	84.01%	7 (9)	0.66 (0.44, 0.87)	<.0001	2.82%

[a]Studies removed: Saravanan 2017, Ezegbe 2019, Zemestani 2016, Robamili 2015, Guo 2017

Comparison	Main strategy	Sensitivity analysis[a]				Main Analysis			
		K (interventions)	Hedges' g (CI)	p	I^2	K (interventions)	Hedges' g (CI)	p	I^2
Active	All Strategies	14 (15)	0.68 (0.31, 1.04)	0.0003	88.30%	12 (13)	0.30 (0.14, 0.47)	.0003	38.18%
	Cognitive and behavioural	9 (9)	0.71 (0.20, 1.22)	.0061	87.97%	7 (8)	0.35 (0.08, 0.61)	.0096	54.08%
Waitlist/No intervention	All Strategies	24 (30)	1.21 (0.92, 1.50)	<.0001	84.79%	21 (26)	0.87 (0.67, 1.07)	<.0001	66.52%
	Cognitive and behavioural	18 (19)	1.17 (0.83, 1.51)	<.0001	85.14%	15 (16)	0.71 (0.53, 0.88)	<.0001	42.08%

Mindfulness/Meditation	3 (4)	1.84 (1.52, 3.16)	0.0064	87.42%	2 (3)	1.02 (0.47, 1.56)	.0003	28.49%

[a]Studies removed: Saravanan 2017, Ezegbe 2019, Zemestani 2016, Robamili 2015, Guo 2017

Anxiety-End of treatment only, waitlist comparisons only

Intervention Type	Strategy	Sensitivity analysis[a,b]				Main analysis			
		K (interventions)	Hedges' g (CI)	p	I²	K (interventions)	Hedges' g (CI)	p	I²
Selective[a]	End of Treatment	6 (6)	0.70 (0.11, 1.29)	.0208	82.82%	5 (5)	0.33 (0.06, 0.61)	.0163	19.85%
Indicated[b]	End of Treatment	19 (24)	0.91 (0.68, 1.15)	<.0001	67.37%	17 (21)	0.73 (0.55, 0.90)	<.0001	37.25%
	Cognitive and behavioural	12 (13)	0.92 (0.54, 1.29)	<.0001	76.65%	10 (11)	0.62 (0.37, 0.87)	<.0001	42.50%

[a]Studies removed: Noormohamadi 2019, [b]Studies removed: Ezegbe 2019, Rezvan 2008

Appendix 2.5a: Attrition meta-regression of adaption on odds of drop-out

Model	K	Variable	OR	95% CI	p-value
1	66	Adapted intervention	0.72	0.45, 1.13	0.1542
2	66	Adapted intervention	0.94	0.57, 1.54	0.8089
		Diagnosis[a]			
		Anxiety, Depression	0.47	0.24, 0.92	0.0264
		Depression	1.15	0.61, 2.18	0.6722
		ED	0.70	0.38, 1.29	0.2527
		PTSD	0.87	0.32, 2.35	0.7851
		Waitlist/No intervention	1.11	0.72, 1.72	0.6339
		Selective Intervention	1.10	0.56, 2.16	0.7912
3		Adapted intervention	1.11	0.54, 2.26	.7802
		Diagnosis[a]			
		Anxiety, Depression	0.63	0.23, 1.73	.3717
		Depression	1.09	0.50, 2.38	.8269
		ED	0.48	0.22, 1.06	.0703
		PTSD	1.02	0.27, 3.90	.9787
		Waitlist/No intervention	0.95	0.53, 1/70	.8672
		Selective Intervention	0.91	0.40, 2.08	.8272
		Delivered face-to-face	0.59	0.23, 1.55	.2850
		Transdiagnostic	0.65	0.30, 1.42	.2811
		Individual format	0.46	0.20. 1/03	.0578
		Number of sessions	1.03	0.92, 1.15	.6287
		Treatment provider	2.06	0.99, 5.30	.0538
		High study quality	0.65	0.34, 1.24	.1918
4		Adapted intervention	1.23	0.54, 2.80	.6146
		Diagnosis[a]			
		Anxiety, Depression	0.37	0.08, 1.70	.2020
		Depression	1.19	0.42, 3.38	.7497
		ED	0.61	0.18, 2.11	.4384
		PTSD	1.60	0.31, 8.14	.5723
		Waitlist/No intervention	1.13	0.57, 2.22	.7234
		Selective Intervention	1.71	0.38, 7.65	.4808

Delivered face-to-face	0.62	0.21, 1.87	.3977
Transdiagnostic	0.68	0.19, 2.40	.5500
Individual format	0.43	0.17, 1.07	.0692
Number of sessions	1.00	0.87, 1.16	.9787
Treatment provider	2.52	1.09, 5.85	.0313
High study quality	0.79	0.35, 1.75	.5584
Age	1.07	0.82, 1.39	.6262
Gender	1.00	0.97, 1.02	.7446

[a] Reference category for diagnosis=Anxiety

Appendix 2.5b: Meta-regression additional predictors of attrition

K	Variable	Unadjusted			Adjusted for disorder, control type, intervention type		
		OR	95% CI	p-value	OR	95% CI	p-value
56	Age	0.91	0.79, 1.05	.2102	0.89	0.78, 1.02	.0881
62	Gender	1.00	0.99, 1.01	.9533	1.00	0.99, 1.02	.6980
33	Ethnicity	1	0.98, 1.01	.6172	1.01	1.00, 1.03	.1653
66	Transdiagnostic	0.73	0.48, 1.10	.1266	1.02	0.56, 1.85	.9574
66	Individual format	0.75	0.50, 1.15	.1889	0.73	0.48, 1.09	.1208
63	Number of sessions	0.99	0.92, 1.07	.8630	0.99	0.93, 1.07	.8784
55	Professional treatment provider	1.41	0.87, 2.28	.1618	1.73	1.01, 2.96	.0456
66	High study quality	0.87	0.52, 1.45	.5874	0.75	0.45, 1.27	.2858

Appendix 4.1: Interview schedule and adaptation based on student experience

Key: *Underlined, italic:* Additions based on student pilot recommendations

~~Strikethrough:~~ Removed based on student pilot recommendations

Topic Guide
[Before recorder]
-introduce self, re-explain what the study is about, consent, confidentiality, no right or wrong answers, right to withdraw at any time

[turn on recorder]

1) EXPERIENCE OF CARE

a. To give our discussion a bit of context, could you tell me a bit about your general experiences of mental health problems and treatment?

b. ~~You have accessed some of the student mental health services at UCL, cAnd~~ could you tell me about your *experience of accessing the student mental health and wellbeing services at UCL?*
[Questions to ask if not covered]

>   i. *Specific services accessed*
>   ii. *choices*
>   iii. *Waiting times*
>   iv. *Difficult or easy to access support?*
>   1. *Did the services seem approachable?*

c. Can we discuss how you think it helped (or didn't help) you?
>   i. *relevance*
>   ii. *sufficiency*
>   iii. *time provided for advice and treatment?*
>   iv. *Was undertaking treatment difficult during your studies?*
>   1. *E.g. side effects, emotional toll of therapy*

d. Did you access the student mental health services because of a pre-existing mental health condition or because of development/exacerbation of symptoms while at university?
>   i. *What made you seek help?*
>   ii. *how long until you decided to seek help?*
>   iii. *Had you accessed mental health services prior to starting university?*
>   iv. *If so, what support had you previously accessed, and how did you go about obtaining this support?*

2) KNOWLEDGE OF CURRENTLY AVAILABLE HELP AND HOW TO ACCESS IT

We are now going to focus on the information provided to students at university…

a. What potential sources of support for mental health ~~problems~~ were you aware of prior to starting at UCL?
   - *i. Had you searched on the UCL website?*
   - *ii. Other forms of own research? Was information easy to find?*
   - *iii. Were you sent information? Were your parents?*
   - *iv. How did you know about these sources (if none of the above)*

b. Was mental health services information provided when you started at UCL?
   - *i. Fresher's week/induction week?*
   - *ii. Information in halls?*
   - *iii. Emails?*
   - *iv. Tutor/department?*
   - *v. Transition mentor?*

c. <u>IF INFORMATION GIVEN</u> What support were you told about?
   - *i. E.g. campus based? Community and NHS support? GP? Academic staff to speak to?*
   - *ii. Did you find any of this information useful?*

d. <u>IF WERE NOT GIVEN INFORMATION</u>: what information, in hindsight do you think would have been most useful to receive?
   - *i. When would be most useful to be told about mental health services?*
   - *ii. ~~What would be the best way of getting information to students~~ What would have been the best way of communicating this information to you?*
   - *iii. What mental health services would be most useful to be told about?*
       1. *Campus based wellbeing advice*
       2. *NHS services?*
       3. *Student counselling services*

e. *~~In what ways do you think the information communicated to you via UCL is effective?~~ How do you think current information provision at UCL affects the process of accessing treatment?*
   - *i. ~~Does~~ Do you think ~~it make it easier/harder?~~ it impacts access to treatment?*
   - *ii. Too much/too little?*
   - *iii. How did the information affect your expectations of the process and subsequent experience?*

3) BARRIERS

I would now like to talk about anything which may prevent you (or others) from getting the help they need…

a. Did you experience any *obstacles whilst attempting to access support?*~~barriers to receiving support?~~
    i. *Anything that* <u>caused</u>~~meant~~ *you* <u>to</u> *stop*~~ped~~ *receiving support sooner than you would have liked?*
    ii. *Anything that made getting the treatment or support you needed more challenging?*

b. What are your thoughts on mental health stigma?
    i. *Impact on seeking support?*
    ii. *Can you think of anything the university could do to reduce this?*

4) EXPECTATION

Going back to your experience of using the services at UCL, we are now going to think about your expectations and whether they were met…

a. How did your experience of the support you received compare to your expectations?
    i. *Waiting times?*
    ii. *Range of treatment options?*
    iii. *Availability and flexibility of services (e.g. out of hours care)?*
    iv. *Treatment provider?*
    v. *Efficacy of treatment?*

5) RECOMMENDATIONS

And lastly I would like to hear your views on improving the services…

a. *Do you have any suggestions for further ways* ~~How do you think~~ UCL could improve ~~the way in which they provide~~ mental health support and treatment?
    i. *What would encourage more students to attend/limit the people who stop attending?*
    ii. *Is there anything you would have liked to have access to but didn't?*

-Thank you
-anything else you would like to add?
-Any questions for me?

[switch off recorder]

-thank participant for their time, arrange payment, any other questions now recorder switched off? Explain process for withdrawing data.

Appendix 4.2: Subthemes and example supporting quotes for personalisation and informed choice

Subtheme	Description	Example supporting quotes
Services for all disorders and all levels of severity	It was frequently highlighted that current support options excluded certain presentations of mental health problems, which it was felt discouraged students from speaking out about the difficulties they were facing, because they were encouraged to instead seek support via external means. This was further highlighted during discussion in the focus group	*"I know they're trained to help and to send me to the right place so that I can get help but I don't know if it's laziness or just when you're anxious you really don't want to go through a lot of, you know, admin things and applying somewhere else. I really just wanted to find a sort of simple way of finding support."[P10]* *"they were just like, if you have any official mental health disorders like eating disorders or specific like OCDs or phobias or something, they won't be able to do anything for you" [FG]*
	It was emphasised that eating disorders are sufficiently prevalent that efforts to provide appropriate support would be	*"I find that it revolves a lot around anxiety, depression and that but they don't really talk about eating disorders, for example, which are really present in [the city] and our age, in your young 20s and I feel like that's*

worthwhile. Focus group discussions confirmed this.	*really something that's common and that's really not spoken about. And maybe that's something that could be, that personally I wish I had – with you know, in the myriad of fliers that I got in my first year, I wish I'd gotten one on that too." [P13]* *"I didn't see that UCL had that much of a counselling service for people with eating disorders specifically, so I kind of know why they couldn't help me." [P15]* *"so maybe even having just like a triage session to know whether someone needs something more intensive. And having a fuller range of services, because eating disorders are a very prevalent thing, especially at universities, so I feel like the option at least needs to be there." [FG]*
Students were not always certain that current options were adequate for severe presentations of mental illness, and students with more complex	*"I think if there was a crisis service that would be amazing" [P10]* *"I don't really know personally this sort of stuff, but it seemed more like a chat rather than, like, actually addressing the problem. I don't know. It might be that sometimes people just need to talk with someone and I would say that it's good, but when – I don't know. I wouldn't really go*

issues were told to seek help elsewhere	*there and tell them that I am suicidal and I want to hurt myself because it just doesn't seem the place." [P2]* *"I saw someone from [university] late in March and I was told that for me the best option would be to go to private therapy if that was an option, just because [university] offers kind of more short-term support, if there's kind of like quite a defined issue you need help with, like a specific thing." [P12]*
It was also highlighted that students wanted a service able to offer mental health support to whoever may need it, regardless of severity, to reduce worries by some students that they were not experiencing problems severe enough to seek help	*"maybe being clear about what they are there for and what sort of issues they're there to address, really. Definitely that would, I think, be a helpful thing. Sort of make people feel like that services are there for them rather than someone else." [P4]* *"I think it probably goes back to some of the things we've talked about before, about just you know, kind of making it clear that there are sort of signposting kind of services available as the first port of call and that you don't have to wait 'til, you know, 'til you're literally kind of crippled with anxiety or paralysed with depression until you ask for help." [P5]*

"And then also like, yeah, because not everyone will identify with like being mentally ill, like they might just, they might not um, but they might still really benefit from that mental health support. So I think, yeah, there's a lot of like, people might read Psychological and Counselling Services, sort of like something like that and think "Oh that doesn't apply to me", when really it really would." [P6]

Some students suggested that advertisements/information for services should describe the difficulties experienced rather than mental health problems (diagnoses), to prevent students who are unsure if they were experiencing difficulties severe enough from not seeking help	*"Maybe more like descriptive stuff like "Are you struggling with X, Y, Z?" Like more kind of scenario things that people can identify with rather than just like "Are you struggling with your mental health?" So if it's like "Do you feel overwhelmed? Like have you got all these deadlines? Like you haven't done your washing and like haven't eaten and like no one to talk to, like maybe you would benefit from this kind of stuff"." [P6]* *"I think sort of breaking down the idea that the Psychological Services are only really there for students who have some kind of diagnosed psychological issue that, you know, is – I think that there's this sort of really high bar for accessing those services, you know, that you have to get, wait until things are really bad to get support." [P5]*

"just the message that sort of it can be tricky to sort of see whether, what are they going through actually kind of validates professional help but just a message of like, it is of course subjective, but if you're feeling unsure and if you're struggling with something, it's probably a good idea, like it doesn't need to be like the full-blown mental health crisis or everything is falling apart. If there's something that's really bothering you, it can be a good idea to just sort of check and see." [P12]

One student also suggested that personalising treatment plans to different severities of symptoms could be one alternative to the 'blanket' 6 session offering currently available. This was supported during the focus group, with a recognition of the need to have the option to step up support for students who need additional help made clear.

"So I don't know whether like UCL can provide like the full Psychological Services that like a NHS provider would provide. It would be good to have variations in the duration of sessions." [P8]

"Yeah, I think it seems like a very one size fits all approach and yeah, I think it could potentially be very harmful in the sense that, I guess a lot of people might be experiencing mental health issues at university for the first time. And if they're getting insufficient support, then I guess that leaves you incredibly helpless, because you've had the university support and you get to the end of that and potentially still feel like

nothing has really been addressed. And it's a bit like, 'where do you go from there?' kind of thing." [FG]

Taking preferences into account	Students stated that they would have appreciated some level of choice in the support provided. For example, students frequently alluded to the idea that they felt they had to be grateful for what they were given, and accept it without request for alteration or complaint. This was further agreed on during focus group discussions.	*"And then I think once you've got that information you can make more of an informed choice rather than – because I think at that point I was just, I was kind of pleased to be getting anything." [P5]* *"I think where like I've had so much interaction with mental health services and I'm very aware of like the lack of funding and issues that face the people working in these services, like my expectations were quite low." [P6]* *"for me, it was like a pressure to feel like I should be grateful for it. Like, given the state of the NHS, the underfunding of mental health services and a long waiting list with those, then just the fact that my university was offering something. I felt like, even though it was only six x 15-minute sessions, which is like five hours to sort out your life, I still felt like I had to be grateful that I'd been seen" [FG]*

Students also suggested that being able to choose the treatment they received would have made their experiences more positive.	*"I think one big thing for me was because after – because when I was in treatment at home, that was group therapy based and I sort of had a very good experience of that. And when I came back, I initially would have liked to join a sort of self-help group or like something group based. And I couldn't really find anything, like my GP didn't know, Psychological Services couldn't really point me anywhere"* [P12] *"I think I was lucky to get a family relationship therapist, because that was related to the problems I was having. But imagine if I didn't have that then I'd just feel like, where's my choice? Couldn't I have chosen a therapist that specialises in something that is applicable to me?"* [P3] *"I kind of asked to see a CBT, asked to have a counselling service as well, but the admin say that I, that whether I get referred to have CBT is up to my psychiatrist."* [P14]
One student reflected on a recent more positive experience where this was the case.	*"I definitely felt the second time round that the kind of, there was flexibility and that there was – that it was kind of, the support I received was tailored for me rather than just a kind of a broad brushstroke, "Well*

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	here's what we have", as a, you know, "Here's your single option, take it or leave it", kind of thing." [P5]
Though it was appreciated that in a large university, personalisation for all may be difficult to achieve.	*"I think that the main problem with UCL is that they're trying to have kind of a general approach to everyone but not everyone reacts the same way to this general approach. And it's wonderful that they have this but it's not – I mean they can't make it different, they can't tailor it to every single individual but every individual needs a different way" [P13]*
Similarly, some students felt that their experience may have improved with choice surrounding treatment provider. This notion arose due to expressions that students did not get along with, or "click" with the therapist they were given, either due to negative interactions or feeling that their therapist could not relate to	*"I think it really depends on the person. And in the wellbeing services I had amazing experiences, most of them were really great experiences but some of them were really bad. And so I think it really depends on the person and what their specialisation is. Because some will understand more easily autistic traits and others won't and yeah, I think it's important to sort of really, to be with the right person." [P10]* *"I think I also, I found it, I struggled to get on well with this particular counsellor, probably, and probably it wasn't helped by the fact that she was quite unreliable in terms of turning up for sessions but she – I'm not*

them due to differences, for example, in ethnicity.	*quite sure what she was sort of aiming for but she kept saying that she didn't think I seemed very anxious as a person and she wasn't sure that I really had a problem with anxiety." [P5]*
	"So it almost feels like it's hard to speak about things that the person doesn't necessarily understand or relate with. So maybe kind of going into the situation wanting to talk about those kind of issues and not having a person with like that diversity of experience might put somebody off" [P8]
However, this was not universal, and some reported very positive experiences with their counsellor.	*He was great, really nice, very insightful, so I had a really great experience with my counsellor actually" [P15]*
	"I was really happy with the therapist that they matched me to or that I got to see…And when I reapplied actually even… I didn't hear anything back from them so I kind of went and got, sorted my own therapy. But when they did get back to me, they offered me appointments with the therapist that I saw before which I thought was really good because I got

	on with her really well and I thought that was like, that was something really good." [P9]
Finally, students appeared to have had different experiences in flexibility for appointments	*"Well I think one thing that I remember finding quite difficult when I was accessing it, was the clashing with my timetable."* [P8]
	"it surprised me that they were willing to be open very early, before the [university] lectures start." [P7]

Appendix 4.3: Subthemes and example supporting quotations for simplifying the process

Subtheme	Description	Example supporting quotes
Importance of collaboration across services and staff	Almost all students mentioned links between support staff and academic staff, however different views were given regarding how connected these two strands of university staff should be. Almost half of the interviewees acknowledged that some students would be put off by the knowledge that academic staff would be informed about any mental health problems they were experiencing, due to a concern that tutor perceptions, or even grades would be influenced, suggesting that	*"between me and the department there are some power relations. Like, they mark my work, they determine whether they admit me as their, like, future student if I want to study further and if I want to apply to the same department" [P1]* *"I think people are always scared of these issues impacting on their grades or their academics, and just make it really clear that even if you go and reach out for help, it won't impact you at all, or it will impact you just positively – not your grades or anything." [P2]* *"I think it should with the permission of the individual student. So if they were saying like "OK, I think like these practical things that your department could do in order to support you would be useful, like do we have your permission to contact them or like can we support you in asking them for these reasonable adjustments?" Like I know that the*

confidentiality is an important aspect of support at university.	*Disability Service are quite good at this like with the creation of Summary of Reasonable Adjustments like the SORA stuff."* [P6]
However, the majority of students subscribed to the idea that having a member of academic staff or personal tutor who understands mental health problems can make academic stressors less prominent issues which would be a beneficial way of providing a clearer route to support. It was also felt that feeling that academic staff don't care impacted negatively on the university experience. Focus group discussions supported this view.	*"And so it would be to have personal tutors who are more accessible, so personal tutors who are willing to take on the role of being a personal tutor and not just an academic advisor that we never see or come into contact with. I think that would be really good."* [P13] *"I've spoken to friends who have gone to their personal tutors, like different personal tutors, and had like such a bad time with it just because their personal tutor was clueless and kind of was like "Oh I don't really know what to do". And then that's really disheartening and then you end up feeling like, they felt like "Oh there's no hope", from that poor interaction."* [P6] *"there's a few who are great advocates for like all the help that's available and they're really clued up on it. But I found in general my professors, like academic staff, were sort of a bit more blasé about it. Like they sort of know it's there and they say "Oh have you sort of*

spoken to someone?" And if you say "Oh yeah", they're like "OK, good, good" and then they sort of move on." [P9]

Those students who had experienced a personal tutor who understood their issues, spoke positively about it	*"And yeah, that was again quite fortunate that my tutor was really nice and approachable and understanding. Yeah. I think that was sort of a fortunate aspect of it in that I can think of – I don't know, I think it was quite nice. He's just done his PHD so he's not that far away in age and he's sort of just quite kind of unassuming and I think having him as a tutor was quite good in that it did sort of feel like the things I was struggling with I would be able to talk to him." [P4]*
	"He knows everything about my disorder and he's helped me to defer exams or make adjustments. He has helped me to kind of manage my time better or when I was not going to lecture, he knew all about that." [P2]
	"my personal tutor is exceptional, I got very lucky with her, she's also like a – she's a qualified doctor, that she's, yeah, she's practicing medicine, so she's very clued up on mental health." [P6]

It was frequently suggested that as a minimum, academic staff should be trained to help point those in need of help in the right direction to facilitate access to support

"it would have been helpful if maybe my tutor had also pointed me to sort of the resources available and just kind of in case you need further academic help or maybe a bit more support with just general stuff." [P12]

"But I think the academic staff need to be more aware of what support is available. So like my supervisor, it would have been really helpful if he could have also sort of pointed out some of these services to me rather than what really happened which was me kind of making him retroactively aware that I was seeking support from X, Y and Z." [P5]

"I think there is like a procedure that personal tutors are meant to take but maybe they need more training so that they kind of know what to like look out for and know what to say or where to signpost to." [P6]

Similarly, the need for collaboration between different support services was discussed by many students who reported

"I think it would be even stronger for UCL to have a very good team that help students to find help, rather than providing help, if that makes sense….I think it should be actually left at that, it should be left very

being confused about who they had seen, who they should have seen, and who they might see next. It was made clear that a first port of call when experiencing mental health problems could improve the experience of accessing support as it would take the guesswork out of deciding who to see. This was also agreed on in the focus group

simple way to say, like just one place that people can go if they need help, just one place saying "I need help"" [P11]

"what is a problem, one issue I have with the two service is I wasn't clear the difference. I wasn't clear what are the differences between these two services, something like that, and what are the limits, what are the remits that they have, if I can ask for help, does that make sense?" [P14]

"I guess maybe it would be more helpful if there was kind of a, more of a kind of a tiered entry I guess, kind of, you know the first, your first sort of contact with the services is actually not necessarily aiming to be sort of therapy at all, but just exploring what your problems are and like what would be helpful….I think if there was kind of a, I guess kind of a signposting service as it were, as like an initial point of contact, that might also help remove that barrier of like well are things bad enough yet or, you know, should I be trying to help myself more in some way that I haven't done yet or? Because it could also point you towards those things, you know, it doesn't have to be an all or nothing answer… I thought that those kinds of mental health support services would all be done through SPS, like I hadn't even thought that that would be done

through Disability Services. I think it would be amazing if those services could talk to each other more because there's some really good support services at UCL but if you don't know that they're there, than you can't use them." [P5]

"I feel like if I was approaching it for the first time, I wouldn't necessarily know what was going to be the right thing for me. And I feel maybe a more unified system in which there are more options, but equally, that that service would be better at maybe having a bit of assessment and then directing you towards a specific part of the service that they think is right for you. Maybe that might be important, because I don't think, necessarily, you know, when you're first approaching this kind of thing, like what is going to be helpful and what isn't." [FG]

A referral was also considered as rejection by some, who highlighted the importance of preventing students getting referred for more intensive or external services from feeling abandoned, for example

"I found it very distressing because I don't like changes, it's one of my autistic traits. And all these changes and all this, I don't know, being sent somewhere else, where I was, because I was, I have a lot of anxiety and I just, you know, needed to speak to someone." [P10]

	through providing support and follow up during the process. The problems associated with being referred on, such as lack of rapport with any therapist, were elaborated on during the focus group.	*"Well like some kind of like buddy system, of like "Do you know what, like you need to go to your GP, let me come with you". Or like "Here's like a – let me plan out with you like what you need to say specifically to your GP in order to access help", because that in itself is really hard."* [P6]

"Yeah, and especially people dealing with a variety of issues, and if you're dealing with something very serious, you kind of want to be with somebody that you trust. And I think that might go if you're being bounced around from person to person." [FG] |
| **Uncertainty** | Difficulty navigating the multiple services on offer, and the sense of uncertainty this could instil, was elaborated on by most students. Over half suggested that in order to understand the system and access the support you need, you needed to have had experience of similar systems and services prior to | *"I've done this a lot of time, because I don't know – even the process of extenuating circumstance, a lot of people, they don't know even how it works."* [P2]

"I think what made it good is that I knew I had a very clear idea of what I was struggling with and what I needed support with and I was able to communicate that to them… because of the help I had before, like when I lived in care, like I had like 24 hour staff, like literally taught me skills of like "This is how you send an email to explain like what is happening |

coming to university, suggesting that the current framework may exclude students experiencing difficulties for the first time.

and what you need. Like this is how you identify like the problems you are having and you communicate like what would be helpful" Whereas I think like people that haven't had that support, like if you're experiencing a mental health problem, like it feels impossible to describe what you're experiencing, let alone like ask for what you need" [P6]

"Yeah. So I, pretty much as soon as I came to UCL, I got in touch with Student Wellbeing because I already kind of foresaw that I would probably have some difficulties at some point, so I just sort of wanted to like get in touch with them as soon as possible…Because I found, you know, I assumed like it would be similar to the NHS in that like the more proactive you are about like, um, contacting people and making yourself known and stuff like that, the more like easier it is to get help when you need it." [P9]

Students with less previous experiences of mental illness described the uncertainty they felt about what they should

"And I think I didn't have a very clear idea of what they could actually offer to me in terms of sort of therapy or support or counselling or whatever." [P12]

	expect from attending mental health support services.	*"Well, yeah, because it's like a random therapist kind of assigned to you, and even after the first assessment it's not done by the therapist that is going to be with you for the six weeks. It's done by someone else, so you just really don't know and you kind of just have to go with it. So yeah, I guess I was a bit nervous and sometimes you just wonder, would they get me? Would they get my culture? Would they just be a big judgemental, kind of thing?" [P3]*
The need for clear, simple information on accessing support	Almost all students talked about the overwhelming array of information available, which was seen as lacking in clarity or a clear directive on where, when or how to go about establishing contact with the support services.	*"In the enrolment day they all distributed a booklet to each student about the Mental Health Services or Wellbeing Services. And it's like – I don't know. At that time I flicked through it, I felt like it's a lot of information, it's too much – that I don't know what to choose and which one best suited me." [P1]* *"I think, so in Freshers Week, I think there should be, I don't know, some kind of information that sort of sums up everything but on the same page so that you can really compare the different services, whether it's for disability or for coursework or for mental health, there's sort of three options and I'm not even sure because I'm quite confused." [P10]*

"Like if you are in a stage that you need help, it's really time consuming and overwhelm – it feels overwhelming too. I know there are many information out there but just looking for these things is just, and sometimes you know having ten options, it's worse than having just one." [P11]

"I think just unloading all the information in the first few weeks might be a bit too much, but I think offering – starting with a general guidance and then going into more specific discussions of support I think would make a difference, because then people who are looking, generally looking, will go to the sources of information that they're given." [P7]

Many students wanted the information available to make the range of options available at the university and externally clear as they were not aware of some of the treatment choices available to them.

"I think it would be helpful, there could be at least like a general breakdown of like "Oh you can sort of, you can go through the NHS, you can go through charities, you can go privately", just sort of, even like a very basic table and maybe at least a few points of contact you could seek out." [P12]

"But when I was waiting to meet my psychiatrist at the waiting room, I was told by other students who were waiting as well, that they are

waiting to see not psychiatrist but psychologist and they have to get assessed to other counselling service but they wasn't aware that they can meet psychiatrist as well….So I wasn't aware that they have a different service for me and they weren't aware that I've got a different service from them as well, which I think is down to the problem that we didn't really understand what could be the option for us."[P14]

"because I didn't realise how easy it was to access things like CBT and like the fact that you can even self-refer. And I think if I had had access to that information a lot earlier in my course, like things wouldn't have been as difficult as they were." [P8]

Some students felt that information they did receive was not always accurate or complete- for example some students expressed shock at the waiting times and limited sessions provided after contacting services. It was also acknowledged that prior warning	*I don't remember it being clear to me that it would only be six sessions though." [P6]* *"Yes. I think for me it would have been helpful, that's just a small thing about kind of my specific route. If they'd given me kind of, even just a vague estimate of the waiting time, so that I would have known that kind of help was still coming." [P12]*

of waiting times may prevent students seeking help	*"I was quite surprised at the end of the session, I was expecting well "I'll see you next week", and actually it was "Well you can go there, there and there"." [P10]*
Despite this, some students did feel that once you knew it was there, information available online was helpful	*"Yeah, yeah. I think the most important part is that people know that it's there, that the information is there so that it can be found if they're looking for it." [P16]* *"I just googled it" [P9]* *"In terms of, like, where to go and how to access stuff, the instructions online are pretty simple" [P3]*

Appendix 4.4. Subthemes and example supporting quotations for feeling abandoned, ignored, or invisible

Subtheme	Description	Example supporting quotes
Faceless and lost in the crowd	The sense of loneliness and invisibility felt due to being one of many students at a large university was clearly illustrated in students' descriptions of their experiences.	*"Yes. I think just to me kind of, in my first-year university didn't always feel like a very sociable and caring place."* [P12] *"it feels extremely anonymous to be filling out a form online about what's going on for you and how, it's really scary."* [P13] *"or try and make university more personal, because I feel like you can get lost in the crowd of, like, 300, 400 people on your course, and you can just feel like a number sometimes"* [P3] *"I think one of the things that was really sort of highlighted to me this year was just how sort of easy it is for things to kind of – I don't know, for people to be struggling with things, but for it to very much slip under the radar just because of the way [university] is, really."* [P4]

And this sense was exacerbated by the extensive online forms required in order to see and speak to someone who could listen. Focus group discussions agreed that this administrative barrier was present across a number of services.

"Well I think that what's helpful is that having, so it's important to have physical contact and not just, you know, fill out forms online and not know where to go in the building and everything… it seems like there's so much – bureaucracy maybe isn't the word, but so many steps to getting somewhere, to getting actual concrete help with your problem."
[P13]

"and I don't even think it's just an issue with the psychology services. I think it's an issue throughout postural support where it feels like there's a lot of hurdles in order to actually discuss problems that you're having."
[FG]

As a result, students emphasised the importance of an environment which felt welcoming as an important contribution to positive experiences. Focus group

"Yeah. OK, like, at first I really didn't know what to expect, but while I was waiting the other warm advisors gave me the impression, the expectation that I will also be treated in a very gentle way. But in the end the reality is like, I waited for a long time and, like, in the end when I

	discussions elaborated on this, describing welcoming atmospheres as contributing to feeling less invisible and more like there are people who care.	*came in her room, she just wanted me to leave. It causes a bit of disappointment."* [P1] *"I think they need some sort of like – like especially for freshers – they need some sort of team or something, like a representation of people that you could go to with events and just friendly, open people. So that it just feels like somewhere you can go to and not be judged and everything, and feel kind of safe. can feel safe. Whereas I think now, and especially when I first came to [university], it was a very cold, hard kind of thing, like 'oh, if you have problems, just go here'. Like it just felt like a service, whereas I feel like it should feel more like a family or a community that's willing to help and listen and understand stuff."* [FG]
Feeling let down	Some students described feeling let down by the services.	*"I started going to therapy and doing it privately because I just, from what had happened with the second-year experience, with trying to reach out to UCL and not getting a response back, I just didn't feel like I would get the support that I needed and so, yeah, that's kind of what it's been."* [P13]

Abandoned	This feeling sometimes arose when being informed of long waiting times, or when trying to seek help at crisis point and resulted in feelings of abandonment at their lowest point.	*"That [the wait] was very difficult just because I didn't have any sense of like how long it might take…. I thought that wasn't going to happen, I'd almost forgotten about it, just because it had been so long." [P12]* *"at the moment as you are, let's say severely depressed or you're really struggling, you just want help at that exact moment. You don't know what in that two-month period, what's going to happen and you don't really – after two months you're not in the same mental state anymore, so it just made me a little bit disappointed and a little bit untrusting towards the whole system." [P15]* *"When I first applied I didn't get an email, like a message or anything until a couple of weeks or possibly months later, and even then, they were just like "you're on a very long waiting list – you'll have to wait for a very long time." And then once they did email me it was just, like, this is months from when I first emailed. And yeah." [P3]*

"I think that time between, you know, filling out the application and actually first getting seen, starting the therapy, like luckily I was able to kind of cope through that time but I'm sure a lot of other people wouldn't have been able to if they had similar circumstances." [P8]

Though others felt that waiting times were to be expected given the large scale of support required for a large university and were not surprised, or did not experience too much distress when waiting.	*"So I mean, the waiting time was obviously something that could be improved on, right? I'm not sure where the problem is – maybe it's facilities, maybe it's staff, maybe it's budget. So [it] might not be a thing that can be fixed short-term but that would be certainly a point that could be improved."* [P16] *"I found it [waiting time] great. I saw someone very quickly."* [P10]
Limits in the number of sessions provided, seen as necessary to prevent even longer waiting lists, were also a source of feelings of abandonment as students felt they were left to deal with their problems alone.	*"You have your six weeks, it's over, find something else, go back to your GP, check out these websites, et cetera, et cetera."* [P3] *"the therapist they had was really good. She really tuned in to my problems and she listened really well and she gave some really good pointers and everything, but it was very short-term. Like, the timing as*

This was agreed in the focus group.

just insufficient, and you could feel that as you were going into the therapy, because they did say it is six weeks." [P3]

"So I remember like when the therapist who was really – I thought she was really brilliant, when she said like "Oh and next week is our last session", I remember being like quite shocked and then I thought like oh actually like that's quite representative of like the mental health service in the UK, but um, sadly." [P6]

"then I guess that leaves you incredibly helpless, because you've had the university support and you get to the end of that and potentially still feel like nothing has really been addressed. And it's a bit like, 'where do you go from there?'" [FG]

"no one's going to open up about that [an eating disorder] on the first session. They might say it like – I don't know – on the fifth or sixth session, and by then, your six sessions is up." [FG]

Appendix 4.5: Subthemes and example supporting quotations for stigma

Subtheme	Description	Example supporting quotes
Dismissing symptoms as stress	It was frequently hinted that a major problem in students was their own self stigma, where they dismiss their difficulties as stress, a common aspect of university life which they should be prepared for and which they should be able to cope with	*"it's just – another thing that I'm kind of blaming myself a bit for not, for having mental health is because I can't deal with my stress and relaxation and my lifestyle and juggling with my routine, something like that." [P14]* *"I think lots of universities have this issue of kind of, it's almost expected that you'll struggle at some point with anxiety around your course or whatever and sometimes sort of disassociating those things is quite hard… And I think there's definitely this feeling that, yeah, that kind of, that sort of work-related stress is really, yeah, kind of expected and not something that you ought to seek help for." [P5]* *"it's quite hard to self-recognise 'at what point is this reactionary stress and an appropriate level of stress?' And then at what point does it dip into 'I need actual help'?" [FG]*

	It was also mentioned by some that this dismissal came from others, including peers and even therapeutic providers, which contributed to fears they were over-reacting or just not able to cope with university.	*"I know that some people are suffering from the stigma of, I don't know, being depressed and then someone telling them "Oh it's fine, just go out and hang out with your friends", whereas depression is an illness." [P10]* *"some people think mental health problem is kind of, it's kind of happened to people who can't deal with their emotion or they can't deal with their relaxation" [P14]* *"I'm not quite sure what she [the therapist] was sort of aiming for but she kept saying that she didn't think I seemed very anxious as a person and she wasn't sure that I really had a problem with anxiety. I felt quite undermined by that I think because it really was a problem for me and I had intermitted because of it and I was feeling very anxious." [P5]*
Raising awareness and normalising	In discussing solutions for stigma, most students felt that more could be done to raise awareness of the difficulties	*"The ideal thing would be to sort of erase this kind of difference there is between mental and physical health." [P10]*

| mental health problems | faced by students with mental health problems, broadening conceptualisations of what constitutes "enough" to warrant seeking support. It was felt that 'normalising' the experiences would contribute towards increased numbers of students seeking help at the university. | *"I'm not sure exactly what they could do but definitely you talking about it and maybe associating it with more general health." [P11]*

"like having a workshop in groups in your department where – like in the same way they do like the, well they try to do the compulsory consent, like sexual consent workshops, like having stuff like that where it's like "OK, what does poor mental health look like? What's available to you?" [P6]

"maybe even just having more regular information going out, just generally about mental health or like encouraging, I don't know, like if you're going to do it in a seminar group type of thing, but just regular check-ins so that people kind of normalise it a little bit more." [P8] |
| | The majority of students also spoke of the need for more open and honest discussion among fellow students regarding mental health problems, in order to reduce the stigma surrounding it. The idea | *"I suppose it's hard to know as one person whether what you're experiencing is normal or not…you can share your experiences with others and that you're probably having at least some similar experiences without really knowing it." [P12]* |

that realising you are 'not the only one' would be helpful was often mentioned. This was added to in the focus group discussion, where students felt that many students put on a brave face, which leads to others not wanting to seek help because they feel they are the only one with difficulties.

"And also amongst friends, so we can all talk about how nervous we are for exams or for whatever it is, but then really talking about the deeper personal issues that wouldn't be appropriate in that context or with new friends in your first year or something like that, I think it's difficult to kind of overcome like that sense of being alone in it or shame maybe a little bit too." [P13]

"And students as well, I feel like it's a large group of people are displaying this mentality that they never get stressed and they're always on top of things and everything. Other people would want to do the same as well, and then, before you know it, it's like half the year. Just like everyone's on it and everyone manages to do everything and look well-rested, and ace all the tests and have a good social life and everything." [FG]

Along a similar line, half of the students felt that developing this into an official peer support scheme could go some way to reducing stigma, through sharing experiences, getting

"have students who talk about the steps that they took and how it helped them and how – just to make it clear for students, for other students who want to take on the act of looking for support in UCL." [P13]

help from people who understand and helping to navigate the system.

"seeing people who are successful but still struggling with these things, having the opportunity to talk to them and talk about their experiences, I would have thought that very helpful in the past." [P16]

"Well like some kind of like buddy system, of like "Do you know what, like you need to go to your GP, let me come with you". Or like "Here's like a – let me plan out with you like what you need to say specifically to your GP in order to access help", because that in itself is really hard." [P6]

"Yeah, because in my course they did have a kind of medic 'mums' and 'dads' thing. So like a person from the year above was there to kind of support you and I think just generally having somebody to, you know, relate to and who has been through the experiences really does help. So maybe having that as like a more official wider scheme could help as well." [P8]

| Shame or embarrassment | More generally, students spoke of the shame and embarrassment ingrained in the experience of mental health problems at university as a result of mental health stigma; a notion validated during the focus group discussion. | *"So there was a bit of shame, I would say, and I think it does prevent a lot of people to access support. I was in Mental Health Society, like part of the committee last year, which is a new society at UCL, and we – well, this society didn't go very well because for instance I thought because it's a new society, but also because people don't want to be part of a society that's called UCL Mental Health Society, because they just don't want to be seen as having a mental health issue.*

And so we experienced a lot of people acting really weird, especially at the freshers' fair. Like, they were even scared of approaching us at the freshers' fair, so yeah, I think that might be a big setback." [P2]

"it almost feels like I kind of have to either mask the problems that I'm dealing with or just not talk about them because it would do me a lot of damage." [P8]

"that idea of shame and guilt and wanting to kind of hide away the fact that you're using those services." [FG] |

	One student spoke of the particular stigma surrounding medical students who they felt others believed should always be able to cope.	*"I mean, for me, the most stigmatising thing is – because I'm a medical student, that medical students should be, like, perfect in every aspect and shouldn't really have mental health problems, otherwise why are they going into such a pressurised job? Why can't they just work in something else, if you're that stressed or if you're that anxious or if you're that depressed or anything? So it kind of just, like, puts people off admitting that they have mental health problems."* [P3]
	A small number of students felt that stigma may become a particular barrier to seeking support due to issues surrounding privacy when attending some appointments. One student also felt that confidentiality could be highlighted more to reassure students. This was elaborated on during the focus group, where a student described the	*"Even the fact I think that it is inside the student centre, that is a bit weird, because then people see you go in"* [P2] *"Yeah, yeah. I think it might be sort of a little bit more comfortable to have somewhere a bit more private. Because basically everyone can see you walking in there, really. Yeah."* [P4] *"because London is so busy, and especially UCL, the buildings are quite busy and if, say, you wanted to talk to someone on the phone, because you're having like a horrible day or you're having like a crisis or something, there's literally nowhere to go. Like there will be people anywhere. Like there's this one corridor that's usually quite quiet, but*

	lack of private space to speak to people on the phone, something students may not have at home or in halls. However, also during the focus group, one student disagreed, indicating that not all students had difficulties surrounding privacy.	*then people still walk through it in one of the buildings. So I feel like there should be like a space for people to go if they need to talk to someone, like not necessary like a professional, but just like privacy, because it doesn't have that." [FG]* *"Well, I didn't have the lack of privacy." [FG]*
Doing better than most	Some students did highlight however, that in terms of reducing stigma, the university was doing better than other universities and countries, indicating that efforts had not gone un-noticed.	*"Well I think, the thing is when I came to UCL I was actually surprised at how much they spoke about it and I felt that was really good…. And so I find that already there is a big emphasis on trying to normalise mental health amongst students and say that it's normal to be going through these kinds of patches when you are at university." [P13]* *"There's a lot of service compared to my previous university." [P14]*

Appendix 4.6: Subthemes and example supporting quotations for superiority of private or external services

Subtheme	Description	Example supporting quotes
Student support advice not being helpful	The majority of students discussed aspects of their experience of university support which were not helpful, resulting in them seeking external and private services. Feelings that support failed to help solve their problems were expressed.	*"Yeah, exactly. But it's a bit weird because when I actually went there, they didn't really address the problem." [P2]* *"So it would be like "Oh you can't get out of bed. Like the way to overcome is to just get out of bed"." [P6]* *"And so I just feel like, from what I remember, it was kind of just like room for me to get my thoughts out but not really any guidance to know what to do with them." [P8]* *"My sessions with UCL, she kind of touched on stuff that could have been the cause of the whole anxiety thing, to begin with, but she didn't go too in-depth into it. Like she just asked me a few questions. And then there was always this bit where she would show like a piece of paper of stuff, like short-term stuff to do, like how to cope and how to relax and everything. It felt a bit like going to the GP in being given like*

	a patient leaflet, whereas like now, I've been with a private therapist for a year and she'd go through like childhood stuff and family stuff." [FG]
However, students were aware that the reason for this was the relatively short timescale that therapists had to work with, with a current limit on the number of sessions provided per student at the university	*"But then obviously like I do feel for the [student] providers because if they are only offered six sessions, like if they can only offer six sessions, like the – like getting, they don't want to ethically like re-traumatise a person by bringing up too much that they then can't like offer them long term support, so then it does become very surface level stuff that they can do. Like "OK, so you're, yeah, you're feeling anxious about this, like just do this thing"."* [P6]
Some students felt that the services they were referred to did not involve staff of the professional level they were expecting, and a very limited number of students reported negative experiences in which university support made the	*"I would say I'd rather talk to a professional instead of an advisory administrative worker who doesn't know anything about this field."* [P1]

"But I don't really know who the people there are but they seem really young, which I don't know – I don't know if they are professionals." [P2]

"it just makes me feel really, really bad. Like, much worse than before I consulted her." [P1] |

	problems they were experiencing worse.	*"And I think the first one [experience of university support], honestly, probably caused more problems than it solved." [P5]*
Having to pay for good treatment	As a result, some respondents reported that in order to receive adequate treatment, they needed to pay for it. This was further supported during the focus group, where the idea that paying reduced waiting times was mentioned.	*"And then I just realised in fourth year that I needed to, like, pay a bit of money to get some sort of therapy." [P3]* *"Yeah, I think it's like you either get the quick treatment but have to pay or you kind of get a subpar treatment, but at least you get it through the university. So I feel like a lot of people are pushed towards going privately and looking externally." [FG]* *"I think it's also the timescale of it as well and I suppose, with NHS services or student services, you're potentially looking at quite a long wait to get that support. Whereas, I guess, with private support, it's going to be a lot more immediate and I guess [university] terms are not very long and it's time is of the essence with these kind of things. I think that's a really significant part of it as well, is the delay" [FG]*
	However, some students described worries about the cost	*"So I know I needed an individual therapist. I just didn't feel comfortable paying as much for a private therapist. And then I had to retake fourth*

	of private therapy, or concern for students who may not be able to afford it	*year, so then I realised "OK, you really have to buckle down on your mental health." So I just found – like, did a massive search and found a reasonably priced private therapist and yeah, that's where I'm at now. I have the group therapy and the private therapist" [P3]* *"I think it was OK for me that they suggested that I could get, that I should try to get help elsewhere just because like I was very lucky, my parents were able to afford that. Of course like that's mainly why this entire thing worked out because my parents were able to pay for that." [P12]*
Student support as the start of a larger journey	Two students consolidated this, explaining how university support services contributed to their development of a better understanding of their mental health, which gave them the building blocks needed to inform additional help-seeking.	*"it definitely made me realise certain stuff that I have been doing that aren't helpful. Like elimination. I never realised actually what that was and that I've been doing that" [P7].* *"And I guess it was quite helpful for me because I don't think I would have thought about seeing somebody privately otherwise." [P5]*

Appendix 5.1: Logistic regression analysis using complete cases only

		Reliable Recovery	Reliable Improvement	Deterioration	Attrition
Model 1	Student	0.78 (0.74-0.84)	0.80 (0.76-0.86)	1.10 (0.98-1.23)	1.08 (1.01-1.15)
Model 2	+ Service level variables *	0.80 (0.75-0.85)	0.83 (0.77-0.89)	1.09 (0.96-1.23)	1.12 (1.04-1.21)
Model 3	+ Baseline severity ‡	0.83 (0.78-0.90)	0.86 (0.79-0.92)	1.04 (0.90-1.19)	1.10 (1.01-1.20)
Model 4	+ Demographic factors §	0.88 (0.81-0.95)	0.90 (0.82-0.98)	0.91 (0.78-1.07)	1.06 (0.95-1.17)

* Number low intensity sessions, number high intensity sessions, weeks from referral to assessment, weeks from assessment to treatment, service.
‡PHQ9, GAD7, Work and Social Adjustment Scale items 2-5, phobias
§ IMD, age, gender ethnicity, diagnosis, long term conditions, medication use, sexual orientation.

Appendix 5.2: Balance between students and matched controls.

Patient characteristic	Student Mean	SD	Same age employed Mean	SD	t	p
PHQ-9	15.12	5.21	14.97	5.30	1.23	.220
GAD-7	13.63	4.30	13.72	4.30	-0.88	.378
WSAS-2	3.38	2.32	3.31	2.34	1.40	.163
WSAS-3	4.38	2.26	4.39	2.28	-0.23	.817
WSAS-4	3.54	2.41	3.51	2.51	0.44	.658
WSAS-5	4.15	2.35	4.17	2.41	-0.40	.687
Agoraphobia item	2.95	2.60	2.94	2.67	0.11	.913
Social phobia item	2.53	2.41	3.48	2.49	0.92	.356
Specific phobia item	2.35	2.57	2.27	2.60	1.34	.182
Number HI sessions	4.90	5.32	4.78	5.35	0.92	.357
Number LI sessions	2.84	2.74	2.88	2.74	-0.58	.563
Waiting time (weeks) - referral to assessment	3.35	3.29	3.25	3.62	1.29	.197
Waiting time (weeks) - assessment to treatment	8.35	7.94	8.48	7.90	-0.67	.503
Age	20.68	2.19	21.51	2.09	-16.91	<.001

Patient characteristic		Student n	%	Same age employed n	%	X²	P
Gender	Male	1368	25.71	730	26.05	0.18	.915
	Female	3933	73.93	2061	73.55		
	Missing	19	0.36	11	0.39		
Ethnicity	White	2711	50.96	1566	55.89	31.99	<.001
	Mixed	460	8.65	224	7.99		
	Asian	933	17.54	402	14.35		
	Black	649	12.20	374	13.35		
	Chinese	95	1.79	39	1.39		

	Other	213	4.00	90	3.21		
	Missing	259	4.87	107	3.82		
Index of Multiple Deprivation (IMD) Decile	1	447	8.44	251	8.84	3.89	.952
	2	1373	25.92	759	26.73		
	3	1108	20.91	566	19.93		
	4	636	12.00	340	11.97		
	5	569	10.74	301	10.60		
	6	426	8.04	227	7.99		
	7	287	5.42	143	5.04		
	8	220	4.15	124	4.37		
	9	104	1.96	51	1.80		
	10	43	0.81	23	0.81		
	Missing	85	1.60	55	1.94		
Sexual Orientation	Heterosexual	3683	69.23	1942	69.31	2.13	.546
	Gay/Lesbian	178	3.35	91	3.25		
	Bi-sexual	299	5.62	138	4.93		
	Missing	1160	21.80	631	22.52		
Medication prescribed	Prescribed	1553	29.19	831	29.66	2.58	.275
	Not prescribed	3475	65.32	1795	64.06		
	Missing	292	5.49	176	6.28		
LTC Case	No	3578	67.26	1897	67.70	0.37	.830
	Yes	798	15.00	423	15.10		
	Missing	944	17.74	482	17.20		
Problem descriptor	Depression	2108	39.62	1115	39.79	3.63	.889
	GAD	869	16.33	481	17.17		
	Mixed A.D	287	5.39	149	5.32		
	OCD	188	3.53	86	3.07		
	Other Phobia and Panic	308	5.79	168	6.00		
	PTSD	137	2.58	78	2.78		
	Social Phobia	348	6.54	169	6.03		
	Unspecified Anxiety	250	4.70	122	4.35		
	Missing	825	15.51	434	15.49		

Note. SD: Standard deviation WSAS: Work and Social Adjustment Scale A.D: Anxiety Disorders

Appendix 5.3: Associations between each outcome and student status moderated by treatment intensity and modality in fully adjusted models[*] using complete cases only

Interaction	Reliable Recovery	Reliable Improvement	Reliable Deterioration	Attrition
Student by main intensity (high intensity) ‡	0.92 (0.78-1.08)	0.92 (0.77-1.11)	0.87 (0.62-1.22)	1.13 (0.92-1.40)
Student by main modality (face to face) §	0.96 (0.82-1.13)	0.92 (0.77-1.10)	1.11 (0.80-1.54)	0.99 (0.81-1.20)

[*]All models adjusted for number of sessions, weeks from referral to assessment, weeks from assessment to treatment, service, PHQ-9 scores, GAD-7 scores, WSAS items 2-5 scores, IAPT phobias scale item scores, IMD, age, gender, ethnicity, diagnosis, long term conditions, medication use, and sexual orientation
‡ N= 11,530 for reliable recovery, reliable improvement and deterioration. N=10,825 for attrition.
§ N= 14,742 for reliable recovery, reliable improvement and deterioration. N=13,710 for attrition.
Note. IAPT: Improving Access to Psychological Therapies. IMD: Index of Multiple Deprivation.

Appendix 5.4: Associations between each outcome and student status moderated by treatment rate fully adjusted models[*], by main intensity type using complete cases only

Interaction	Reliable Recovery	Reliable Improvement	Reliable Deterioration	Attrition
Student by treatment rate (Mainly high intensity sub-group) ‡	0.61 (0.37-1.01)	1.13 (0.63-2.04)	0.36 (0.11-1.18)	2.04 (1.03-4.04)
Student by treatment rate (Mainly low intensity sub-group) §	0.74 (0.43-1.29)	0.94 (0.50-1.78)	1.07 (0.29-3.89)	0.66 (0.33-1.31)

[*]All models adjusted weeks from referral to assessment, weeks from assessment to treatment, service, PHQ-9 scores, GAD-7 scores, WSAS items 2-5 scores, IAPT phobias scale item scores, IMD, age, gender, ethnicity, diagnosis, long term conditions, medication use, and sexual orientation
‡ N= 6,110 for reliable recovery, reliable improvement and deterioration. N=5,782 for attrition.
§ N= 4,529 for reliable recovery, reliable improvement and deterioration. N=4264 for attrition.
Note. IAPT: Improving Access to Psychological Therapies. IMD: Index of Multiple Deprivation.

Appendix 6.1: Work and Social Adjustment Scale (Mundt et al., 2002)

Rate each of the following questions on a 0 to 8 scale: 0 indicates no impairment at all and 8 indicates very severe impairment.

1. Because of my [disorder], my ability to work is impaired. 0 means not at all impaired and 8 means very severely impaired to the point I can't work.

2. Because of my [disorder], my home management (cleaning, tidying, shopping, cooking, looking after home or children, paying bills) is impaired. 0 means not at all impaired and 8 means very severely impaired.

3. Because of my [disorder], my social leisure activities (with other people, such as parties, bars, clubs, outings, visits, dating, home entertainment) are impaired. 0 means not at all impaired and 8 means very severely impaired.

4. Because of my [disorder], my private leisure activities (done alone, such as reading, gardening, collecting, sewing, walking alone) are impaired. 0 means not at all impaired and 8 means very severely impaired.

5. Because of my [disorder], my ability to form and maintain close relationships with others, including those I live with, is impaired. 0 means not at all impaired and 8 means very severely impaired.

Appendix 6.2a: Descriptive statistics of classes of WSAS3 (social leisure) trajectories

| | | WSAS-3 Social Leisure | | | | | | | | | | | | | | | |
| | Class 1 (n=2,590) | | | Class 2 (n=1,456) | | | Class 3 (n=224) | | | Class 4 (n=788) | | | Class 5 (n=162) | | | F (df=4) | p |
Continuous measures	n	M	SD	n	M	SD	n	M	SD	n	M	SD	n	M	SD		
PHQ-9	2,590	13.53	4.93	1,456	17.00	4.89	224	16.47	5.35	788	16.21	5.03	162	15.45	5.19	132.44	<.001
GAD-7	2,589	12.68	4.15	1,456	14.63	4.16	224	14.61	4.32	788	14.53	4.16	162	13.81	4.22	66.98	<.001
WSAS-2	2,544	2.74	2.10	1,436	4.15	2.35	222	3.82	2.40	784	3.88	2.33	162	3.07	2.48	106.66	<.001
WSAS-3	2,544	2.86	1.58	1,436	6.09	1.42	222	5.92	1.58	784	6.37	1.19	162	1.70	1.39	1703.55	<.001
WSAS-4	2,543	2.88	2.16	1,436	4.33	2.43	222	4.05	2.61	784	4.25	2.44	162	2.83	2.39	119.50	<.001
WSAS-5	2,544	3.36	2.17	1,436	5.14	2.14	222	4.81	2.35	784	4.80	2.33	162	3.65	2.39	178.48	<.001
Agoraphobia item	2,571	2.32	2.34	1,447	3.85	2.64	224	3.44	2.82	786	3.37	2.69	162	2.76	2.55	96.13	<.001
Social phobia item	2,571	2.64	2.06	1,447	4.79	2.32	224	4.19	2.43	786	4.19	2.41	162	3.43	2.54	241.23	<.001
Specific phobia item	2,571	1.96	2.34	1,446	2.94	2.74	224	2.49	2.71	786	2.63	2.74	162	2.46	2.68	37.03	<.001
Number LI sessions	2,590	2.99	2.72	1,456	2.80	2.88	225	2.93	3.03	788	3.12	2.67	162	3.05	3.02	1.95	.100
Number HI sessions	2,590	4.69	5.10	1,456	6.46	5.97	225	6.99	5.41	788	4.22	4.79	162	6.17	5.46	40.20	<.001
Weeks-referral to assessment	2,587	3.40	3.14	1,456	3.32	3.12	225	3.34	3.27	787	3.16	2.93	162	3.20	3.19	1.03	.389
Weeks-assessment to treatment	2,526	7.99	7.64	1,414	8.79	7.98	221	9.50	8.72	760	8.46	8.11	157	10.29	9.35	5.87	<.001
Age	2,590	20.71	2.23	1,456	20.55	2.18	225	20.51	2.19	788	20.62	2.18	162	20.54	2.18	1.57	.178
Categorical Measures	**N**	**%**		**N**	**%**		**N**	**%**		**N**	**%**		**N**	**%**		**X2 (df)**	**p**
Gender — Male	687	26.53		341	23.42		58	25.78		209	26.52		51	31.48		10.77 (8)	.215
Gender — Female	1,894	73.13		1,107	76.03		167	74.22		577	73.22		111	68.52			
Gender — Missing	9	0.35		8	0.55		0	0.00		2	0.25		0	0.00			
Ethnicity — White	1,382	53.36		677	46.50		115	51.11		370	46.95		73	45.06		69.16 (24)	<.001
Ethnicity — Mixed	236	9.11		114	7.83		18	8.00		67	8.50		11	6.79			
Ethnicity — Asian	445	17.18		283	19.44		38	16.89		153	19.42		29	17.90			
Ethnicity — Black	238	9.19		220	15.11		30	13.33		117	14.85		23	14.20			
Ethnicity — Chinese	70	2.70		28	1.92		3	1.33		13	1.65		4	2.47			

		n	%	n	%	n	%	n	%	n	%	χ² (df)	p
	Other	91	3.51	67	4.60	12	5.33	35	4.44	13	8.02		
	Missing	128	4.94	67	4.60	9	4.00	33	4.19	9	5.56		
	1	203	7.84	129	8.86	18	8.00	72	9.14	13	8.02		
	2	612	23.63	422	28.98	58	25.78	221	28.05	49	30.25		
	3	539	20.81	290	19.92	50	22.22	150	19.04	36	22.22		
	4	342	13.20	171	11.74	26	11.56	94	11.93	12	7.41		
	5	306	11.81	132	9.07	24	10.67	88	11.17	21	12.96		
IMD decile	6	214	8.26	108	7.42	21	9.33	60	7.61	9	5.56	42.09 (40)	.38
	7	140	5.41	83	5.70	12	5.33	44	5.58	9	5.56		
	8	116	4.48	58	3.98	6	2.67	27	3.43	3	1.85		
	9	53	2.05	28	1.92	4	1.78	15	1.90	6	3.70		
	10	27	1.04	13	0.89	1	0.44	5	0.63	1	0.62		
	Missing	38	1.47	22	1.51	5	2.22	12	1.52	3	1.85		
	Heterosexual	1,761	67.99	1,017	69.85	164	72.89	548	69.54	117	72.22		
Sexual orientation	Gay/Lesbian	89	3.44	45	3.09	10	4.44	25	3.17	8	4.94	8.52 (12)	.743
	Bi-sexual	153	5.91	82	5.63	12	5.33	46	5.84	9	5.56		
	Missing	587	22.66	312	21.43	39	17.33	169	21.45	28	17.28		
	Prescribed-not taking	114	4.40	84	5.77	8	3.56	30	3.81	6	3.70		
Medication	Prescribed and taking	596	23.01	379	26.03	63	28.00	200	25.38	39	24.07	25.80 (12)	.011
	Not prescribed	1,742	67.26	894	61.40	148	65.78	520	65.99	105	64.81		
	Missing	138	5.33	99	6.80	6	2.67	38	4.82	12	7.41		
	No	1,776	68.57	935	64.22	155	68.89	550	69.80	110	67.90		
Long term condition	Yes	377	14.56	236	16.21	35	15.56	106	13.45	29	17.90	13.34 (8)	.101
	Missing	437	16.87	285	19.57	35	15.56	132	16.75	23	14.20		
	Depression	935	36.10	629	43.20	84	37.33	345	43.78	79	48.77		
Problem Descriptor	Mixed A.D.	143	5.52	85	5.84	20	8.89	31	3.93	8	4.94	156.54 (32)	<.001
	GAD	486	18.76	164	11.26	38	16.89	124	15.74	31	19.14		
	OCD	125	4.83	43	2.95	11	4.89	17	2.16	4	2.47		

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											F	p
	PTSD	58	2.24	42	2.88	5	2.22	20	2.54	4	2.47		
	Other phobia and panic	155	5.98	83	5.70	13	5.78	51	6.47	6	3.70		
	Social phobia	119	4.59	155	10.65	23	10.22	49	6.22	6	3.70		
	Unspecified anxiety	123	4.75	60	4.12	7	3.11	35	4.44	6	3.70		
	Missing	446	17.22	195	13.39	24	10.67	116	14.72	18	11.11		
	Reliable recovery	1,348	52.05	364	25.00	144	64.00	499	63.32	43	26.54	445.96 (4)	0.001
Treatment outcomes	Reliable improvement	1,913	73.86	871	59.82	199	88.44	670	85.03	85	52.47	236.23 (4)	0.001
	Deterioration	136	5.25	143	9.82	6	2.67	24	3.05	30	18.52	92.58 (4)	0.001
	Attrition	682	28.12	516	39.15	25	11.57	212	28.46	52	37.41	93.64 (4)	0.001

Appendix 6.2b: Descriptive statistics of classes of WSAS5 (close relationships) trajectories

	WSAS-5 Close relationships										
	Class 1 (n=3,498)			Class 2 (n=1,565)			Class 3 (n=158)			F	p
Continuous measures	n	M	SD	n	M	SD	n	M	SD	(df=4)	
PHQ-9	3,497	14.10	5.15	1,565	17.07	4.70	158	17.45	4.89	206.82	<.001
GAD-7	3,496	13.10	4.26	1,565	14.66	4.10	158	15.01	3.96	83.22	<.001
WSAS-2	3,446	3.00	2.22	1,545	4.11	2.36	157	4.02	2.33	134.96	<.001
WSAS-3	3,446	4.00	2.20	1,545	5.13	2.16	157	5.71	1.89	173.30	<.001
WSAS-4	3,445	3.21	2.33	1,545	4.17	2.44	157	4.58	2.41	102.33	<.001
WSAS-5	3,446	3.55	2.25	1,545	5.31	2.09	157	5.85	1.89	393.48	<.001
Agoraphobia item	3,475	2.74	2.53	1,557	3.43	2.65	158	3.42	2.89	40.92	<.001
Social phobia item	3,475	3.25	2.34	1,557	4.21	2.45	158	4.18	2.55	93.85	<.001

	N	Mean	SD	N	Mean	SD	N	Mean	SD		p
Specific phobia item	3,475	2.21	2.51	1,556	2.71	2.68	158	2.67	2.85	20.87	<.001
Number LI sessions	3,498	3.03	2.73	1,565	2.77	2.84	158	3.03	3.15	4.97	.007
Number HI sessions	3,498	4.73	5.16	1,565	6.36	5.84	158	6.01	4.77	51.19	<.001
Weeks-referral to assessment	3,495	3.38	3.16	1,564	3.21	2.92	158	3.68	3.75	2.62	.073
Weeks-assessment to treatment	3,399	8.16	7.81	1,525	8.90	8.06	154	9.34	8.75	5.67	.004
Age	3,498	20.70	2.24	1,565	20.50	2.13	158	20.67	2.18	4.32	.013

Categorical Measures		**N**	**%**	**N**	**%**		**N**	**%**		**X2 (df)**	**p**
Gender	Male	901	25.76	400	25.56		45	28.48		4.00 (4)	.406
	Female	2,588	73.99	1,156	73.87		112	70.89			
	Missing	9	0.26	9	0.58		1	0.63			
Ethnicity	White	1,820	52.03	725	46.33		72	45.57		33.94 (12)	.001
	Mixed	307	8.78	122	7.80		17	10.76			
	Asian	586	16.75	329	21.02		33	20.89			
	Black	386	11.03	221	14.12		21	13.29			
	Chinese	86	2.46	30	1.92		2	1.27			
	Other	141	4.03	71	4.54		6	3.80			
	Missing	172	4.92	67	4.28		7	4.43			
IMD decile	1	280	8.00	139	8.88		16	10.13		18.87 (20)	.530
	2	884	25.27	436	27.86		42	26.58			
	3	715	20.44	326	20.83		24	15.19			
	4	434	12.41	186	11.88		25	15.82			
	5	404	11.55	150	9.58		17	10.76			
	6	271	7.75	130	8.31		11	6.96			
	7	200	5.72	79	5.05		9	5.70			
	8	148	4.23	57	3.64		5	3.16			
	9	73	2.09	27	1.73		6	3.80			
	10	33	0.94	13	0.83		1	0.63			
	Missing	56	1.60	22	1.41		2	1.27			

Sexual orientation	Heterosexual	2,399	68.58	1,093	69.84	115	72.78	7.58 (6)	.271
	Gay/Lesbian	113	3.23	56	3.58	8	5.06		
	Bi-sexual	199	5.69	92	5.88	11	6.96		
	Missing	787	22.50	324	20.70	24	15.19		
Medication	Prescribed-not taking	152	4.35	84	5.37	6	3.80	5.05 (6)	.538
	Prescribed and taking	838	23.96	399	25.50	40	25.32		
	Not prescribed	2,312	66.09	993	63.45	104	65.82		
	Missing	196	5.60	89	5.69	8	5.06		
Long term condition	No	2,388	68.27	1,040	66.45	98	62.03	8.49 (4)	.075
	Yes	513	14.67	235	15.02	35	22.15		
	Missing	597	17.07	290	18.53	25	15.82		
Problem Descriptor	Depression	1,278	36.54	727	46.45	67	42.41	97.17 (16)	<.001
	Mixed A.D.	175	5.00	96	6.13	16	10.13		
	GAD	641	18.32	182	11.63	20	12.66		
	OCD	143	4.09	52	3.32	5	3.16		
	PTSD	78	2.23	45	2.88	6	3.80		
	Other phobia and panic	242	6.92	60	3.83	6	3.80		
	Social phobia	224	6.40	115	7.35	13	8.23		
	Unspecified anxiety	164	4.69	60	3.83	7	4.43		
	Missing	553	15.81	228	14.57	18	11.39		
Treatment outcomes	Reliable recovery	1,898	54.26	399	25.50	101	63.92	381.48 (2)	<.001
	Reliable improvement	2,679	76.59	919	58.72	140	88.61	192.87 (2)	<.001
	Deterioration	164	4.69	173	11.05	2	1.27	79.50 (2)	<.001
	Attrition	919	27.79	547	39.49	21	13.91	83.53 (2)	<.001

Appendix 6.3: Full Logistic regression results for models 1-4.

WSAS item	Model		Class (vs class 1)	Reliable Recovery	Reliable Improvement	Deterioration	Attrition
WSAS-3: Social leisure activities	Model 1	Trajectory class	Class 2	0.31 (0.27 - 0.35)	0.53 (0.46 - 0.60)	1.97 (1.54 - 2.51)	1.64 (1.43 - 1.89)
			Class 3	1.64 (1.23 - 2.17)	2.71 (1.78 - 4.11)	0.49 (0.22 - 1.13)	0.33 (0.22 - 0.51)
			Class 4	1.59 (1.35 - 1.87)	2.01 (1.62 - 2.49)	0.57 (0.36 - 0.88)	1.02 (0.85 - 1.22)
			Class 5	0.33 (0.23 - 0.48)	0.39 (0.28 - 0.54)	4.10 (2.66 - 6.32)	1.53 (1.07 - 2.18)
	Model 2	+ Service level variables*	Class 2	0.25 (0.21 - 0.29)	0.44 (0.38 - 0.51)	2.14 (1.67 - 2.74)	2.80 (2.34 - 3.34)
			Class 3	1.33 (1.00 - 1.78)	2.11 (1.38 - 3.22)	0.57 (0.25 - 1.31)	0.62 (0.40 - 0.98)
			Class 4	1.62 (1.37 - 1.92)	2.04 (1.64 - 2.54)	0.57 (0.36 - 0.88)	0.88 (0.72 - 1.08)
			Class 5	0.27 (0.19 - 0.39)	0.32 (0.23 - 0.44)	4.52 (2.92 - 7.01)	2.64 (1.72 - 4.06)
	Model 3	+ Baseline severity ‡	Class 2	0.31 (0.26 - 0.36)	0.38 (0.32 - 0.45)	3.02 (2.27 - 4.00)	1.98 (1.63 - 2.41)
			Class 3	1.70 (1.26 - 2.29)	1.88 (1.22 - 2.88)	0.74 (0.32 - 1.72)	0.45 (0.28 - 0.71)
			Class 4	2.06 (1.72 - 2.46)	1.82 (1.45 - 2.28)	0.74 (0.47 - 1.17)	0.66 (0.53 - 0.82)
			Class 5	0.30 (0.20 - 0.43)	0.29 (0.21 - 0.40)	5.65 (3.58 - 8.90)	2.28 (1.47 - 3.53)
	Model 4	+ Demographic factors§	Class 2	0.31 (0.26 - 0.36)	0.37 (0.31 - 0.44)	3.22 (2.41 - 4.29)	1.96 (1.61 - 2.39)
			Class 3	1.73 (1.28 - 2.34)	1.87 (1.22 - 2.88)	0.77 (0.33 - 1.80)	0.44 (0.28 - 0.70)
			Class 4	2.07 (1.72 - 2.48)	1.80 (1.43 - 2.26)	0.77 (0.48 - 1.21)	0.64 (0.51 - 0.80)
			Class 5	0.28 (0.19 - 0.42)	0.28 (0.20 - 0.39)	5.95 (3.73 - 9.50)	2.30 (1.48 - 3.58)
WSAS-5: Close social relationships	Model 1	Trajectory class	Class 2	0.29 (0.25 - 0.33)	0.43 (0.38 - 0.49)	2.53 (2.02 - 3.16)	1.70 (1.49 - 1.94)
			Class 3	1.49 (1.07 - 2.08)	2.38 (1.45 - 3.91)	0.26 (0.06 - 1.06)	0.42 (0.26 - 0.67)
	Model 2	+ Service level variables*	Class 2	0.24 (0.21 - 0.28)	0.37 (0.32 - 0.42)	2.74 (2.18 - 3.44)	2.82 (2.39 - 3.33)
			Class 3	1.32 (0.94 - 1.84)	2.00 (1.21 - 3.31)	0.28 (0.07 - 1.15)	0.69 (0.42 - 1.13)
	Model 3	+ Baseline severity ‡	Class 2	0.28 (0.25 - 0.33)	0.32 (0.27 - 0.36)	3.79 (2.96 - 4.85)	2.29 (1.93 - 2.72)
			Class 3	1.67 (1.19 - 2.36)	1.70 (1.02 - 2.81)	0.40 (0.10 - 1.64)	0.52 (0.31 - 0.86)
	Model 4	+ Demographic factors §	Class 2	0.28 (0.24 - 0.32)	0.32 (0.27 - 0.36)	3.69 (2.87 - 4.76)	2.34 (1.97 - 2.79)
			Class 3	1.72 (1.21 - 2.43)	1.68 (1.01 - 2.79)	0.41 (0.10 - 1.68)	0.52 (0.31 - 0.87)

* Number low intensity sessions, number high intensity sessions, weeks from referral to assessment, weeks from assessment to treatment, trust.

‡PHQ9, GAD7, phobias

§ IMD, age, gender ethnicity, diagnosis, long term conditions, medication use, sexual orientation.

ẟ N=5,221 for reliable recovery, reliable improvement and deterioration. N=4,843 for attrition

Appendix 6.4: Logistic regression analysis using complete cases only.

WSAS item	Model	Class (vs class 1)	Reliable Recovery	Reliable Improvement	Deterioration	Attrition
	Model 1 (n= 5,221 for reliable recovery, reliable improvement and deterioration. n= 4,843 for attrition.)	Trajectory class	Class 2	0.31 (0.27 - 0.35)	0.53 (0.46 - 0.60)	1.97 (1.54 - 2.51)	1.64 (1.43 - 1.89)
			Class 3	1.64 (1.23 - 2.17)	2.71 (1.78 - 4.11)	0.49 (0.22 - 1.13)	0.33 (0.22 - 0.51)
			Class 4	1.59 (1.35 - 1.87)	2.01 (1.62 - 2.49)	0.57 (0.36 - 0.88)	1.02 (0.85 - 1.22)
			Class 5	0.33 (0.23 - 0.48)	0.39 (0.28 - 0.54)	4.10 (2.66 - 6.32)	1.53 (1.07 - 2.18)
	Model 2 (n= 5,074 for reliable recovery, reliable improvement and deterioration. n= 4,711 for attrition.)	+ Service level variables*	Class 2	0.25 (0.22 - 0.29)	0.44 (0.38 - 0.51)	2.08 (1.61 - 2.68)	2.79 (2.34 - 3.34)
			Class 3	1.30 (0.97 - 1.74)	2.07 (1.36 - 3.17)	0.57 (0.25 - 1.32)	0.62 (0.39 - 0.98)
WSAS-3: Social Leisure activities			Class 4	1.62 (1.37 - 1.93)	2.06 (1.65 - 2.57)	0.54 (0.34 - 0.85)	0.89 (0.72 - 1.10)
			Class 5	0.26 (0.18 - 0.38)	0.32 (0.23 - 0.45)	4.49 (2.87 - 7.00)	2.68 (1.73 - 4.14)
	Model 3 (n=5,042 for reliable recovery, reliable improvement and deterioration. n= 4,680 for attrition.)	+ Baseline severity ‡	Class 2	0.31 (0.26 - 0.37)	0.38 (0.32 - 0.45)	2.91 (2.18 - 3.88)	1.97 (1.62 - 2.41)
			Class 3	1.66 (1.23 - 2.25)	1.86 (1.21 - 2.86)	0.73 (0.31 - 1.70)	0.45 (0.28 - 0.71)
			Class 4	2.05 (1.70 - 2.45)	1.84 (1.46 - 2.32)	0.70 (0.43 - 1.12)	0.66 (0.53 - 0.82)
			Class 5	0.29 (0.20 - 0.43)	0.29 (0.21 - 0.41)	5.52 (3.48 - 8.77)	2.29 (1.47 - 3.57)
	Model 4 (n=5,042 for reliable recovery, reliable improvement and deterioration. n= 4,680 for attrition.)	+ Demographic factors§	Class 2	0.31 (0.26 - 0.37)	0.37 (0.32 - 0.44)	3.11 (2.32 - 4.17)	1.96 (1.60 - 2.39)
			Class 3	1.69 (1.24 - 2.29)	1.86 (1.20 - 2.86)	0.76 (0.33 - 1.78)	0.44 (0.27 - 0.71)
			Class 4	2.05 (1.70 - 2.46)	1.82 (1.44 - 2.29)	0.72 (0.44 - 1.15)	0.64 (0.51 - 0.80)
			Class 5	0.28 (0.19 - 0.41)	0.29 (0.20 - 0.40)	5.86 (3.64 - 9.43)	2.31 (1.48 - 3.61)
WSAS-5: Close relationships	Model 1 (n= 5,221 for reliable	Trajectory class	Class 2	0.29 (0.25 - 0.33)	0.43 (0.38 - 0.49)	2.53 (2.02 - 3.16)	1.70 (1.49 - 1.94)

recovery, reliable improvement and deterioration. n= 4,843 for attrition.)		Class 3	1.49 (1.07 - 2.08)	2.38 (1.45 - 3.91)	0.26 (0.06 - 1.06)	0.42 (0.26 - 0.67)
Model 2 (n= 5,074 for reliable recovery, reliable improvement and deterioration. n= 4,711 for attrition.)	+ Service level variables*	Class 2	0.24 (0.21 - 0.28)	0.37 (0.32 - 0.42)	2.76 (2.19 - 3.48)	2.78 (2.36 - 3.29)
		Class 3	1.34 (0.96 - 1.89)	2.08 (1.24 - 3.48)	0.29 (0.07 - 1.19)	0.65 (0.39 - 1.09)
Model 3 (n=5,042 for reliable recovery, reliable improvement and deterioration. n= 4,680 for attrition.)	+ Baseline severity ǂ	Class 2	0.29 (0.25 - 0.33)	0.31 (0.27 - 0.36)	3.86 (3.00 - 4.97)	2.28 (1.92 - 2.71)
		Class 3	1.71 (1.21 - 2.42)	1.74 (1.03 - 2.92)	0.42 (0.10 - 1.74)	0.48 (0.29 - 0.82)
Model 4 (n=5,042 for reliable recovery, reliable improvement and deterioration. n= 4,680 for attrition.)	+ Demographic factors §	Class 2	0.28 (0.24 - 0.33)	0.31 (0.27 - 0.36)	3.75 (2.90 - 4.86)	2.32 (1.95 - 2.77)
		Class 3	1.76 (1.24 - 2.51)	1.72 (1.02 - 2.90)	0.43 (0.10 - 1.77)	0.49 (0.29 - 0.83)

* Number low intensity sessions, number high intensity sessions, weeks from referral to assessment, weeks from assessment to treatment, trust.

ǂPHQ9, GAD7, phobias

§ IMD, age, gender ethnicity, diagnosis, long term conditions, medication use, sexual orientation.

Appendix 6.5: comparisons between classes who improved and classes who remained impaired in associations with treatment outcomes: fully adjusted models with imputed data

WSAS item	Model	Class (vs class 2)	Reliable Recovery	Reliable Improvement	Deterioration	Attrition
WSAS-3: Social Leisure activities	Model 4*	Class 3	5.59 (4.09 - 7.64)	4.99 (3.24 - 7.69)	0.25 (0.11 - 0.57)	0.22 (0.14 - 0.36)
		Class 4	6.62 (5.40 - 8.13)	4.8 (3.80 - 6.07)	0.24 (0.15 - 0.39)	0.32 (0.25 - 0.41)
WSAS-5: Close relationships	Model 4*	Class 3	6.05 (4.22 - 8.67)	5.19 (3.12 - 8.64)	0.11 (0.03 - 0.46)	0.22 (0.13 - 0.38)

Note: N=5,221 for reliable recovery, reliable improvement and deterioration. N=4,843 for attrition
* Adjusted for number low intensity sessions, number high intensity sessions, weeks from referral to assessment, weeks from assessment to treatment, trust, PHQ9, GAD7, phobias, IMD, age, gender ethnicity, diagnosis, long term conditions, medication use, sexual orientation.

Appendix 6.6: comparisons between classes who improved and classes who remained impaired in associations with treatment outcomes: fully adjusted models with complete cases only

WSAS item	Model	Class (vs class 2)	Reliable Recovery	Reliable Improvement	Deterioration	Attrition
WSAS-3: Social Leisure activities	Model 4*	Class 3	5.32 (3.88 - 7.31)	4.85 (3.14 - 7.48)	0.25 (0.11 - 0.59)	0.23 (0.14 - 0.37)
		Class 4	6.53 (5.30 - 8.05)	4.82 (3.79 - 6.13)	0.23 (0.14 - 0.37)	0.32 (0.25 - 0.41)
WSAS-5: Close relationships	Model 4*	Class 3	6.13 (4.25 - 8.83)	5.34 (3.16 - 9.01)	0.12 (0.03 - 0.48)	0.21 (0.12 - 0.36)

Note: N=4,992 for reliable recovery, reliable improvement and deterioration. N=4,634 for attrition
* Adjusted for number low intensity sessions, number high intensity sessions, weeks from referral to assessment, weeks from assessment to treatment, trust, PHQ9, GAD7, phobias, IMD, age, gender ethnicity, diagnosis, long term conditions, medication use, sexual orientation.