FACTORS THAT INFLUENCE MENTAL HEALTH OF UNIVERSITY AND COLLEGE STUDENTS IN THE UK: A RAPID MIXED METHODS SYSTEMATIC REVIEW

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Introduction

Poor mental health of further and higher education students is a growing public policy concern[1, 2]. A 2020 Insight Network survey of students from 10 universities suggests that "1 in 5 students has a current mental health diagnosis" and that "almost half have experienced a serious psychological issue for which they felt they needed professional help" - an increase from 1 in 3 in the same survey conducted in 2018[3]. The global coronavirus pandemic and measures to contain it has led to a worsening of the levels of poor mental health among young people including students in higher education[4]. In order to develop high quality interventions that seek to improve the mental health of young people in higher education it is necessary to have a good understanding of the factors that contribute to poor mental health and those that strengthen mental wellbeing.

Review objectives

The overall aim of this review was to identify, appraise and synthesise existing research evidence that explores the aetiology of poor mental health and mental wellbeing amongst students in tertiary level education. This included co-producing with stakeholders, a conceptual framework to help understand the mechanisms which underpin the development of poor mental health amongst tertiary level students. We also aimed to identify gaps in both research and existing provision of services, systems, policies and support to improve mental wellbeing amongst students to inform recommendations for future research and innovation.

Methods

We undertook a rapid mixed methods systematic reviews, including quantitative and qualitative literature and integrating the findings from our stakeholder engagement consultations. We limited our evidence to primary studies undertaken in the UK institutions of higher education and published within the past decade (2010-2020). Data was tabulated and subject to narrative synthesis. We also extracted data and included a description of recommendations for practice from the primary studies. A conceptual framework was used to integrate the findings from the quantitative, qualitative and stakeholder engagement consultations.

Results

We included 39 primary studies undertaken in the UK and published between 2010-2020 exploring the factors associated with poor mental health or positive mental well-being of students in higher education. Twenty-nine of the studies were quantitative surveys, 4 studies used mixed methods and 6 were qualitative in design.

Quantitative Data

There was a wide range of variables assessed in the included studies. These were categorised into those arising at the level of the individual, the family, wider social networks, and university level. The included studies used surveys, 9 were longitudinal and 28 were cross sectional in design, to assess the impact of the variables of interest and mental health outcomes.

A number of variables were strongly and consistently found to be associated with poor mental health outcomes and placed students at greater risk of poor mental health. These included students who categorised themselves as LGBTQ. They also included students who were exposed to childhood trauma before university. Over controlling parenting styles could influence the ability of young people to adapt to the many changes that transition to university entails. Older students appeared to be a lower risk of developing poor mental health than students who arrived at university straight from school.

Previous mental illness, a family history of poor mental health, existing mental health conditions, low levels of mental health literacy, poor help seeking behaviour and those with poor social skills also were associated with a higher risk of developing poor mental health.

Personal characteristics that enabled students to adapt to change, adopt positive coping behaviours when faced with stress and build social networks were most strongly associated with positive mental wellbeing, flourishing and happiness. Negative self-perception and poor coping strategies were strongly associated with poor mental health outcomes.

The most protective and important variables that appeared to act as important buffers against the stresses of the many changes that university introduces included; the loss of established friendship networks and the need to create new networks, new methods of learning, geographical separation from family, protecting from poor mental health, a sense of belonging and a supportive social network. Many of these factors appeared to create positive and negative feedback loops, with students who were able to develop networks, gain support when needed, develop greater self-assurance and build stronger networks, while students who felt isolated, then experienced depressive symptoms, became more isolated and locked in a downward spiral.

University induction programmes appeared to be associated with better mental health, the quantitative data was limited and more mixed in the role of financial stress, and accommodation factors.

We have categorised a number of variables as indicators, or red flags, and are strongly associated with poor mental health. These include lack of engagement with learning, across a spectrum of learning activities including, seeing tutors, attending the library, on-line learning,

attending lectures, accessing learning material. Students with poor mental health also more likely to adopt unhealthy lifestyles, with excessive use of alcohol, poor sleep habits and unhealthy eating.

Six qualitative and 4 mixed methods studies were included in the review. Six themes were identified during the analysis and synthesis of this data. These included coping mechanisms self-perception (belonging and identity), support networks, work-life balance, managing expectations and self-control. These themes were consistent with the variables identified as important in the quantitative studies and offered explanatory support for some of the associations seen. For example, 'belonging' was a strongly and significantly associated with student mental wellbeing. Students who may already feel they are an 'outsider' (LGBTQ, ethnic minority, disadvantaged background) may be therefore particularly vulnerable.

The synthesis of the quantitative and qualitative data, and consultation stakeholders has led to the development of a conceptual model. Variables could be viewed as 'vulnerabilities', i.e. factors that increase the association with poor mental health, those factors that act as 'buffers' and protect mental wellbeing, 'triggers' describing factors that either alone or in combination or with increasing intensity increase the risk of poor mental wellbeing and finally 'indicators' describing factors that may be a sign of poor mental health. The model provides a framework to help with considering which factors an intervention might be addressing and where these are targeted (individual, family, social, university or policy level).

We also extracted data regarding the recommendations for interventions made by the primary authors. We compared these alongside existing evaluated interventions to identify gaps in knowledge and practice. This analysis indicated that there is considerable scope for innovations in practice and their evaluation.

These include:

- Interventions before university to improve preparation of young people and their families for the transition to university.
- Exploratory work to identify the acceptability and feasibility of identifying students at risk or who may be exhibiting indications of deteriorating mental health
- Interventions that set out to foster a sense of belonging
- Creating environments that are helpful for building social networks
- Improving mental health literacy and access to high quality support services

Conclusion

The review revealed a wide range of variables and the mechanisms that may explain how they impact upon mental wellbeing and increase the risk of poor mental health amongst students.

It also revealed the need for interventions that are implemented before young people make the transition to higher education. We identified young people who are particularly vulnerable and the factors that arise that exacerbate poor mental health. We highlight that a sense of belonging and supportive networks are important buffers and that there are indicators including lack of engagement that may enable early intervention to provide targeted and appropriate support. Finally, we have identified areas where future innovations in practice can be considered that address evidence-based factors that undermine or support student mental health.

Introduction

Poor mental health of further and higher education students is a growing public policy concern[1, 2]. A 2020 Insight Network survey of students from 10 universities suggests that "1 in 5 students has a current mental health diagnosis" and that "almost half have experienced a serious psychological issue for which they felt they needed professional help" - an increase from 1 in 3 in the same survey conducted in 2018[3]. According to a review of 105 Further Education (FE) colleges in England, 85% of colleges reported an increase in mental health difficulties over a three-year period[1]. More specifically, all colleges reported students experiencing depression and 99% of colleges reported students experiencing severe anxiety with these also being the most prevalent mental health problems among university students[3, 5]. These common mental health difficulties are associated with a number of negative outcomes such as academic underperformance and increased risk of dropping out of university[6, 7].

Transitions are important periods for student well-being. It is common for mental health problems to arise whilst students are acclimatising to their new environment as they face a unique set of stressors such as forming new friendships, managing money and perhaps living away from home for the first time and adjusting to independent learning. Indeed, a UK cohort study found that levels of psychological distress increase on entering university[8], and recent evidence suggests that the prevalence of mental health problems among university students, including self-harm and suicide, is rising[9, 10], with increases in demand for services to support student mental health and reports of some universities finding a doubling of the number of students accessing support[11]. The higher levels of mental health problems in students are partly due to the tendency for mental health to be worse in young adults, with the highest rates of common mental health disorder symptoms being found in women aged 16-24, and men aged 25-34, and decreasing thereafter[12] (McManus et al, 2016[12]) though work by O'Brien et al (2001[88]) on this dataset (the Adult Psychiatric Morbidity Survey) could not identify the student population within the larger cohort of young adults, and as noted in the University Mental Health Student Charter, "Accurately estimating how many students experience poor mental health is difficult, as there is an absence of large scale, weighted prevalence studies"[2]. Similarly, despite the apparent rising rates, there is no consensus on how the mental health of students compares to people of the same age in the general population.

Policy changes

When considering the policy changes which have had an influence on the student experience, and on the levels of mental health problems seen in the student population, the biggest change has arguably been the move to widen HE participation and to enable a more diverse demographic to access University education. The trend for widening participation has been continually rising since the late 1960s[13] but gained impetus in the 2000s through the work of HEFCE[14]. Macaskill (2013[89]) suggests that the increased access to higher education will have resulted in more students attending University from minority and less affluent backgrounds, meaning that more students may be vulnerable to mental health problems, and these students may also face greater challenges in making the transition to higher education.

Another significant change has been the introduction of tuition fees in 1998, which required students to pay up to £1,000 per academic year. Since then, tuition fees have increased significantly and differently from place to place. With the abolition of maintenance grants, around 96% of government support for students now comes in the form of student loans[15]. It is estimated that in 2017, UK students were graduating with average debts of £50,000, and this figure was even higher for the poorest students (ibid). There is a clear relationship between a student's mental health and financial well-being[16], with "increased financial concern being consistently associated with worse health"[17].

With the increasing awareness and concern in the higher education sector and national bodies regarding student mental health has come increasing focus on how to respond. Various guidelines and best practice have been developed, e.g. 'Degrees of Disturbance'[18], 'Good Practice Guide on Responding to Student Mental Health Issues: Duty of Care Responsibilities for Student Services in Higher Education'[19] and the recent 'The University Mental Health Charter'[2]. Universities UK produced a Good Practice Guide in 2015 called "Student mental wellbeing in higher education"[20].

An increasing number of initiatives have emerged that are either student-led or jointly developed with students, and which reflect the increasing emphasis students and student bodies place on mental health and well-being and the increased demand for mental health support:

- Nightline - www.nightline.ac.uk
- Students Against Depression - www.studentsagainstdepression.org
- Student Minds - www.studentminds.org.uk/student-minds-and-mental-wealth.html
- The Alliance for Student-Led Wellbeing - www.alliancestudentwellbeing.weebly.com/

COVID-19

The recent global coronavirus pandemic has had a huge impact on mental health across society, and there is concern that younger people (ages 18-25) have been particularly affected. Data from Canada[21] indicate that among survey respondents, "almost two-thirds (64%) of those aged 15 to 24 reported a negative impact on their mental health, while just over one-third (35%) of those aged 65 and older reported a negative impact on their mental health since physical distancing began" (ibid, p.4). This suggests that older adults are more prepared for the kind of social isolation which has been brought about through the response to COVID-19, whereas young adults have found this more difficult to cope with. UK data from the National Union of Students reports that for over half of UK students, their mental health is worse than before the pandemic[4]. Before Covid-19, students were already reporting increasing levels of mental health problems[2], but the COVID-19 pandemic has added a layer of "chronic and unpredictable" stress, creating the perfect conditions for a mental health crisis[22]. The travel restrictions enforced during the pandemic have also impacted on student mental health, particularly for international students who may have been unable to commence studies or go home to see friends and family during holidays[23].

Services for students

Services offered within FEIs and HEIs typically include either individual or group counselling. According to an online survey of UK student counselling services, there was an increase in demand for support services over a three-year period in further education sectors[24]. This increased demand is set within a context of a reduction in government funding which has led to closures of student counselling services in FE[25]. Similarly, there has been an increase in the number of students seeking support from university counselling services[11]. Ninety-four percent of Higher Education Institutions (HEIs) reported an increase in demand for their counselling services over the past five years[11]. Despite this increase, the capacity of professional services to offer 1 to 1 support to large numbers of students is limited[26], and there are currently long waiting lists[27].

Although requests for professional support have increased substantially[28], only a third of HEI students with mental health problems seek support from counselling services in the UK [29]. Many students do not seek help due to barriers such as stigma or lack of awareness of services[30]. Without formal support or intervention, there is a risk of deterioration. As a substantial proportion of students do not seek formal help[29], and given the increase in mental health problems among students[1, 10], FEIs and HEIs have recognised the need to move beyond traditional forms of support and provide alternative, more accessible interventions aimed at improving mental health and well-being. Indeed, such institutions

present a unique opportunity to identify, prevent, and treat mental health problems because they support multiple aspects of students' lives including academic studies, pastoral and counselling services, and residential accommodation.

It is, therefore, important for further education institutions (FEIs) and HEIs to offer accessible and effective interventions for their students. Worsley et al (2019)[31] conducted an overview of existing reviews. They identified 24 reviews published between 1999-2019. Their review focused on reviews of interventions. They identified 11 intervention types that had been reviewed for student mental health and well-being, including mindfulness-based interventions, technology-delivered interventions, cognitive behavioural interventions, psychoeducation interventions, recreation programmes, relaxation interventions, educational/personalised mail feedback interventions, acceptance and commitment training interventions, setting-based interventions, suicide-prevention interventions, and the Tomatis method. Worsley et al (2019)[31] identified the lack of data to inform which individuals best respond to which treatment formats. Existing reviews did not consider the distribution of inequalities within or across population subgroups including by socio-economic status, ethnicity, age, gender, disability and sexuality. Nor did they explore the individual differences and differential impact, so interventions are more tailored to suit particular student characteristics leading to more suitable and effective interventions. They also highlighted the need to review the wider social determinants of student health and well-being – for example, the living environment including physical surroundings and social spaces environment, quality and accessibility of accommodation and social relationships.

In consultation with our stakeholders, we are suggesting the need to prioritise exploring further the wider social determinants of student health and well-being. Prevention and appropriate targeting of interventions at those most at risk depends upon an understanding of how individual, environmental, social and economic factors might contribute to well-being and poor mental health amongst students.

Methods

Review objectives

The overall aim of this review was to identify, appraise and synthesise existing research evidence that explores the aetiology of poor mental health and mental wellbeing amongst students in tertiary level education. We aimed to gain a better understanding of the mechanisms that lead to poor mental health amongst tertiary level students and, in so doing, make evidence-based recommendations for policy, practice and future research priorities.

- Specific objectives in line with the project brief were to:
- To co-produce with stakeholders a conceptual framework for exploring the factors associated with poorer mental health in students in tertiary settings. The factors may be both predictive, identifying students at risk, or causal, explaining why they are at risk. They may also be protective, promoting mental wellbeing.
- To conduct review drawing on qualitative studies, observational studies and surveys to explore the aetiology of poor mental health in students in university and college settings and identify factors which promote mental wellbeing amongst students.
- To identify evidence-based recommendations for policy, service provision and future research that focus on prevention and early identification of poor mental health.

Identification of relevant evidence

The following inclusion criteria were used to guide the development of the search strategy and the selection of studies.

Population: We included students from a variety of further education settings (16 yrs+ or 18 yrs+, including mature students, international students, distance learning students, students at specific transition points).

Context: University and Colleges, the focus of the review is the UK. We were also interested in the context prior to the beginning of tertiary education, including factors during transition from home and secondary education or existing employment to tertiary education.

Outcomes: Any factor shown to be associated with mental health of students in tertiary level education. This included clinical indicators such as diagnosis and treatment and/or referral for depression and anxiety. self-reported measures of wellbeing, happiness, stress, anxiety and depression. We did not include measures of academic achievement or engagement with learning as indicators of mental wellbeing.

Studies: We included cross sectional and longitudinal studies that looked at factors associated with mental health outcomes. We also included qualitative studies that explored

the experiences and attitudes of students, families, and university staff of transition and experiences of higher education

Data extraction and quality appraisal

We extracted and tabulated key data from the included papers. Data extraction was undertaken by one reviewer, with a 10% sample checked for accuracy and consistency. For qualitative papers we extracted data from both the authors' interpretations and from raw data within the published paper.

Methods of synthesis

We undertook a narrative synthesis structured around the conceptual framework.

Search strategy

Searches were conducted in the following electronic databases: Medline, Applied Social Sciences Index and Abstracts (ASSIA), International Bibliography of Social Sciences (IBSS), Science and PsycINFO.

The search strategy combined a number of terms relating to students and mental health and risk factors. The search terms included both subject (MeSH) and free-text searches. The searches were limited to papers about humans in English, published from 2010 to June 2020.

The full search strategy for Medline is provided in Appendix 1.

In addition to electronic database searching, we used supplementary methods of citation searches on the nine included qualitative studies, and scrutiny of relevant websites for reports and other grey literature. Reference lists of included studies were also screened for potentially relevant citations. The list of websites searched is provided in Appendix 2.

An additional search was conducted for relevant theories and models on Medline, the search is provided in Appendix 3.

Public involvement

We established a public advisory group specifically for this review, in addition to the public involvement group which oversees the work of the Centre. We advertised the opportunity to be involved on the People In Research website and received 25 expressions of interest. We selected from those who responded on the basis of achieving a balance of parents/family members, different types of students, and people living in different areas of the UK.

The group of fourteen members comprised both parents and students, those studying part time and full time, mature students and those aged in their early twenties, those recently completed studies and still studying, and from different academic disciplines.

The group met virtually on three occasions. The first meeting was held at the beginning of the review in July 2020, and the agenda for the meeting comprised an introduction to public health as a field of research, information on how systematic reviews are carried out, clarification of the roles of the group in the study, and detail on the aims and purpose of the review. Much of the session was taken up by exploration of group member perceptions of influences on the mental health of students. We presented an outline diagram with boxes relating to individual factors, environmental factors, social factors, and economic factors at the stages of pre-university/college, transition and at University/college, and the group discussed what factors should go in each.

A third meeting was convened to discuss outputs from the study, in particular, whether infographics, evidence summaries, social media or short film might be useful tools to communicate the findings of the review. We discussed who the audiences were for study outputs, and what format outputs should be for each audience. The team provided some examples of infographics, YouTube presentations and videos to inform the discussion.

Public involvement informed the study in a number of different ways at different points in the process. Input from the group was important in contextualising our understanding of the literature, and in particular provided an opportunity to compare the research evidence with lived experience. The group acted as a valuable “sounding board” for the team, and often challenged us on clarity of meaning, and existing conceptions for example regarding forms of presentation and aspects of interest to the public. The group informed our analysis and interpretation of the review findings and assisted in identifying key messages. The group is continuing to work with us on producing outputs.

Other stakeholder involvement

We approached a range of organisations relating to student mental health including University counselling services and charity organisations. Given the challenges of the ongoing Covid-19 pandemic and other pressing priorities for these stakeholders, we found it difficult to gain external involvement. However, we attended a virtual meeting of a group of early career researchers interested in student mental health during the early stages of the review to get their input on any relevant literature that they were aware of, and our developing framework. Feedback regarding the developing framework was positive, although the researchers highlighted how interlinked the influencing factors frequently were, and the challenges of categorisation.

Results

After de-duplication, the searches generated 6114 records, of which 125 were retrieved as full papers. An additional 17 papers were identified from checking the reference lists of the included studies, and a further 264 papers were identified via citation searching. Of these, 39 were found to meet the inclusion criteria.

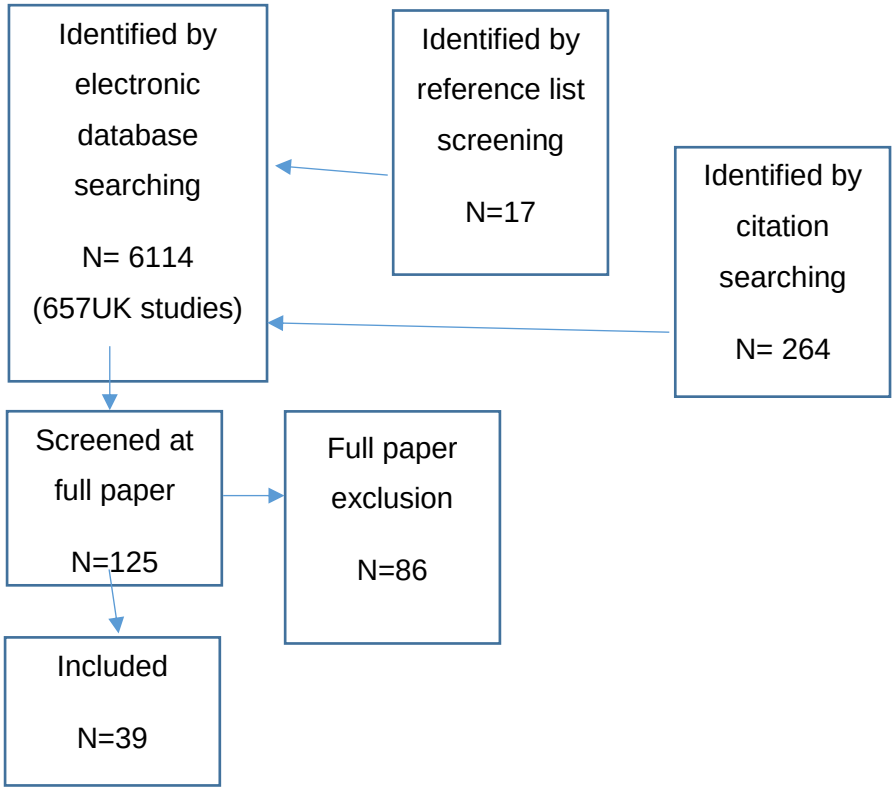


Figure 1. Diagram illustrating the process of study selection.

We identified 39 primary studies undertaken in the UK and published between 2010-2020 exploring the factors associated with mental health or positive mental well-being of students in higher education. We identified 6 qualitative studies exploring the experiences and attitudes of young people themselves, 29 quantitative studies that measured and quantified the strength of the association or risk of variables to mental health outcomes and 4 mixed methods papers.

We have integrated the views of our stakeholder group throughout the process of the review:

- Identifying the factors they believe to triggers, buffers or mediators to mental well-being or poor mental health of students in higher education

- To explore how these factors may interact and build, compounding the positive or negative impact of the variables. These are presented as vignettes throughout the results
- To contribute to the development of a visual model that conveys the inter-relatedness of the factors identified in this review.

We present the quantitative measures of variables, followed by the qualitative studies, which allow us to explore the mechanisms explaining the associations within the quantitative data. We also include a description of relevant explanatory theories that aid understanding of causal mechanisms that lead to poor mental health amongst students in tertiary education.

Following a description of the evidence, we describe interventions recommended in the primary studies and consider alongside interventions that have already been implemented and evaluated. These interventions and their evaluations are drawn from a recent systematic review[31]. Our purpose was to identify research gaps and priorities for intervention development and evaluation.

Quantitative Studies

Description of included studies and participants

Twenty-nine quantitative studies (35 papers) met the inclusion criteria. The majority of included quantitative studies (n=22) were cross-sectional surveys. Nine studies (in 10 publications) [32-41] were longitudinal in design, recording survey data at different time points to explore changes in the variables being measured. The duration of time that these studies covered ranged from 19 weeks to 12 years. The total number of students that participated in the quantitative studies was 17,916, with studies ranging in size from 100 to 3706. Eighteen studies recruited student participants from only one university; five studies [39, 41-49] included seven or more universities. Six studies [35, 37, 39, 41, 49-51] only recruited first year students, while the majority of studies recruited students from a range of year groups. Five studies [34, 35, 52-54] recruited only, or mainly, psychology students. A number of studies focused on students studying particular subjects including: nursing [55] medicine [56], business [57], sports science [58]. One study [38] recruited LGBTQ students, and one [36] recruited students who had attended hospital having self-harmed. The majority of study participants were female 65.4% (11,588/17,728). The mean age of the participants ranged from 19.1 to 28 years. Ethnicity was not reported in 19 of the studies. Where ethnicity was reported the proportion that were 'white British' ranged from 71 – 90.4%. See Table 1 and 2 for a summary of the characteristics of the included studies and the participants.

Table 1 Summary of quantitative Studies

First author	Design	N=	N=	Year group	subjects	% BAME % female	Mean age
Berry (2012)[52]	CS -QS	57	1	3.5% (n=2) 1st year 75.4% (n=43) 2nd year 1.8% (n=1) 3rd year 19.3% (n=11) postgraduate	72% psychology	? BAME 86% F	21.2
Boulton (2019)[32]	Longitudinal QS	175	1	49% 1st year 49% 1st year 27% 2nd year 21% 3rd year	multiple	66% female ? BAME	NR
Davies (2019)[33]	longitudinal /prospective	325	?	NR	NR	BAME NR 70.8% female	?
Denovan (2017a)[34]	longitudinal 1 year	192	1	?	psychology	82% female	19,7
Denovan (2017b)[59]	CS QS	202	1	NR	social science students	73.8% female BAME NR	22.8
El Ansari (5 papers) (2013, 2014 a,b,c 2015)[42-45, 60]	CS QS	3706	7	NR	NR	72.8% female	24.9
Freeth(2012)[61]	CS QS	1325	1	NR	NR	61.90%	20.1
Gnan(2019)[47]	CS QS	1948	multiple	NR	NR	NR BAME 46.9% F	20.3
Hassel (2018)[53]	CS QS	77	1	NR	psychology	80.5% female	19.1
Hixenbaugh (2012)[50]	CS QS	429	1	1st year	NR	69% F	21.8
Holliman (2018)[35]	Longitudinal survey	186	1	1st year	psychology	75% female 76% from UK 'most' were white British	19.2
Honney (2010)[56]	CS QS	853	1	NR	medicine (n=553) non-medical (n=300)	66% female 37.4% BAME	?
Jackson (2015)[48]	CS QS	230	multiple	NR	NR	52% female NR BAME	21.3
Jessop (2020)[62]	CS QS	337	1	1st year students, 101 (29.97%) 2nd year, 117 (34.72%) 3rd year	NR	69.1% female	21.1

				and 24 (7.12%) fourth year.			
Kotera (2019)[57]	CS QS	138	1	NR	business	49% female 29% international students	21.2
Lloyd (2014)[63]	CS QS	315	3	NR	NR	83% female 92% UK born 95% spoke English as their primary language at home	23.4
Mahadevan (2010)[36]	case control	261	1	?	NR	70% female	?
McIntyre (2018)[64]	CS QS	1135	1	• 1st -year students comprised 46% • 2nd - and 3rd year students made up 35% and 21%, respectively.	• Health and Life Sciences (30%), Humanities and Social sciences (42%) and Science and Engineering (18%)	71% F 82% white	20.8
McLafferty (2019)[51]	CS QS	739	4	1st year	NR	61% Female	21
Nightingale (2013)[37]	longitudinal (1 year)	331	1	1st year	multiple	53.6% F White British 87.2%	18-49
Norbury (2019)[54]	CS QS	546	2	1st 291 (53) 2nd 225 (41) 3rd 30 (6)	89% psychology	84% F NR	20.4
Oliver (2010)[58]	CS QS	146	1	1st or 2nd year	sports science	33.6% F	19.3
O'Neill (2018)[38]	longitudinal retrospective (1year)	739	1	NR	NR	62.5% F NR	21
Por (2011)[55]	prospective correlational survey	130	NR	range	nursing	90% female 47.7% British 18.5% African 4% Asian 4% Caribbean	28

Richardson (2017a,2017b,2018)[40, 41, 65]	longitudinal survey (12-14 months)	454	1	range	NR	77.9 % female 89.6% white	19.9
Richardson (2015)[39]	Longitudinal	390	every university	1st year	multiple	77.9% F 90.4% White British	19.8
Taylor (2020)[66]	CS QS	707	2	NR	multiple faculties	75.2% F 83.0% White	23.1
Thomas (2020)[67]	CS QS	510	multiple	1st year	multiple	60.8% F 49.6 British	18-24 (n=476)
Tyson (2010)[68]	CS QS	100	1	NR	NR	80% female	20.4

CS QS :cross sectional questionnaire survey, NR: not reported.

Table 2: Mixed Methods Studies

First Author	**Study design**	**Student N= Qual (bold) quant**	**University N=**	**Year group**	**Subjects**	**%BAME %Female**	**Mean age**
Aceijas (2014)[69]	Focus groups Interviews	NR	1	All	NR	White 45% Black 23% Asian 23% Mixed 9% 70% F	23.6
Gorczynski (2017)[70]	survey	380	1	54.5% 1st year	77.1% sports science	NR BAME	20.9
Kannanagara (2018)[71]	Semi structured interviews	**10** 440	1	**100% Grads** 81% undergrads	NR	BAME NR **70% F** 55.7% F	NR (age 21-39)
Ribchester (2014)[72]	Focus groups	**10** 413	**1**	**NR**	**English / Geography**	**NR**	**NR**

Factors associated with mental health outcomes

The included observational studies all tested the extent to which the factors selected for study were associated with mental health outcomes.

The numerous factors are grouped within three categories:

- Pre-university factors
- Factors at transition
- University factors

The factors are inter-related and potentially compounding and cumulative, with no single factor on its own being a trigger or a buffer to mental wellbeing or poor mental health. The included describe associations, not causation. The heterogeneity within this body of evidence, with variables measured using different tools means we have described our findings narratively, giving where possible an indication of the strength of associations.

One limitation of the quantitative data is that reported variables may not include all variables that are present, and/ or important. We have addressed this limitation by including qualitative data and by consulting our Patient and Public Involvement (PPI) group. The figure below shows the variables identified within the literature and those identified by the PPI group. It serves to illustrate that the evidence itself is not exhaustive in addressing important and relevant variables.

Individual Factors

Age

Six studies[36, 38, 51, 52, 55, 56, 64] with a total number of 3,596 respondents examined a student's age and association with mental health (see Table 3). There was inconsistency in the study findings, with studies finding that age (21 or older) was significantly associated with fewer depressive symptoms[56], more depression[51] or non-significant[38, 64]. Being aged 21 years or older was associated with a lower rate of self-harm, and suicide ideation and attempt[38, 51]. Students who were older also demonstrated better coping skills[52, 55]. Theoretical models that seek to explain this mechanism have suggested that older age groups may cope better due to emotion-regulation strategies improving with age[73].

Table 3: Age variables

Study	Factors (variable age – MH variable)	Association
Berry (2012)[52]	age - dysfunctional coping	R= -0.27, p=0.04
Honney (2010)[56]	students who had joined their degree programme immediately after finishing school vs those who had	stat significant

	completed a previous degree – depressive symptoms	
ONeill (2018)[38]	Age > 21 – self harm Age > 21 – suicide ideation Age > 21 - Suicide attempt	NS NS OR 2.02* p<.05
McIntyre (2018)[64]	Age – depression, anxiety or paranoia	NS
McLafferty (2018)[51]	Age > 21 - depression Age > 21 – anxiety Age > 21 - Suicidal behaviour Age > 21 - self-harm Age > 21 - coping	1.830** (OR) NS (OR) NS (OR) 0.54* (OR) B 0.098 p<0.01
Por (2011)[55]	age – emotional intelligence	r 0.18, p<0.05

Sexual orientation

Four studies[47, 51, 66, 70] examined the association between poor mental health and sexual orientation status. In all of the studies LGBTQ students were at significantly greater risk of mental health problems. The risk of MH problems in these students compared with heterosexual students, ranged from OR 1.4 to 4.5. The types of outcome measures varied and are shown in table 4.

Table 4: LGBTQ Factors

Study	**Variables**	**OR**
Gnan (2019)[47]	Bisexual vs monosexual Current mental health problem Suicide risk Self harm	 1.59(1.19–2.14), p<0.005 1.51(1.14–1.99), p<0.005 1.39(1.05–1.84), p<0.05
	Trans (any sexual orientation) vs cisgender LGBQ Current mental health problem Suicide risk Use of mental health services Self-harm	 2.77(1.89–4.09), p<0.005 2.44(1.64–3.63), p<0.005 3.25(2.25–4.68), p<0.005 2.95(2.01–4.31), p<0.005
Gorczynski (2017)[70]	Bisexuals indicated the lowest levels of well-being (M=33.78, SD=8.42) and differed significantly from heterosexuals (M=47.92, SD=8.99) (mean difference=−14.15, 95 per cent CI=−22.65-5.64, p=0.000). No significant differences between students of other sexualities (p=0.05).	
McLafferty (2018)[51]	Sexuality (non-heterosexual) Better coping Depression Anxiety Suicidal behaviour Self-harm	 NS 2.191** 2.494** 4.193*** 4.456***
Taylor (2020)[66]	LGB Status Non-Suicidal Self Injury Suicide attempt	 1.94 (1.23, 3.07) 2.52 (1.53, 4.16)

** p=0.01 *** p=0.001

Ethnicity

Only two studies[56, 64] examined the extent to which ethnicity was associated with mental health (see Table 5). The earlier study reported that the risks of depression were significantly greater for those who categorised themselves as non-white (OR 8.36). There was no significant difference in the McIntyre et al (2018) study[64]. The small number of participants from ethnic minority groups represented across the studies means that this data is very limited.

Table 5: Ethnicity variables

Study	Variables	Finding
Honney (2010)[56]	White v non-white and depression	8.36 p=0.004
McIntyre (2018)[64]	Ethnicity, depression, anxiety , paranoia	NS

OR: odds ratio NS : non-significant

Gender

Six studies[35, 47, 51, 52, 56, 64] examined whether gender was associated mental health variables. The MH variables measured differed, preventing pooling and comparison. The results were inconsistent, suggesting that females were more at risk of poor mental health in three studies, and non-significant in another three (see table 6).

Table 6: Gender variables

Study	Variable 1- MH variable	OR or correlation
Berry (2012)[52]	gender – attachment and coping	NS
Gnan (2019)[47]	female v male Current mental health problem Suicide risk Use of mental health services Self-harms	 2.47(1.86–3.27), p<0.005 1.32(1.05–1.67), p<0.05 2.23(1.77–2.82), p<0.0005 4.03(3.15–5.14), p<0.0005
Honney (2010)[56]	female vs male and depression	11.051, p<0.001
Holliman (2018)[35]	gender – adaptability, engagement	NS
McIntyre (2018)[64]	gender – depression, anxiety, paranoia	NS
McLafferty (2018)[51]	female vs male – better coping	males better coping r=0,2 p<0.001

NS: non-significant, OR: odds ratio

Psychological Variables

Thirteen studies[34, 35, 37, 43, 48, 51, 52, 55, 58, 59, 63, 66, 71] assessed the association of psychological variables and different aspects of mental wellbeing and poor mental health (see Table 7). We have grouped the psychological variables into the following three categories: firstly, those measuring an individual's response to change and stressors including adaptability, resilience,

grit and emotional regulation[34, 35, 37, 51, 52, 55, 58, 59, 63, 71]. Secondly, those that measure self-esteem and body image[43, 66] and finally those that explored the relationship between autism and depressive symptoms[48].

Understanding factors that influence students' affect and wellbeing offers the potential to find ways to identify strategies that enhance the students' abilities to cope with the challenges of higher educations.

The evidence from eight included quantitative studies suggests that students with psychological strengths including; optimism, self-efficacy[15, 34, 59], resilience, grit[71], use positive reappraisal[58], have better coping behaviours[52] and emotionally intelligent[55],[37] are more likely to experience greater mental wellbeing (see table 7 for a summary of the measurement tools and measures of association). These psychological strengths, as defined in the included studies, are summarised in table 7. The positive association between these psychological strengths and mental well-being, positive affect range from r=0.2-0.5 and OR1.27[34, 37, 55, 58, 59], low to moderate correlations. The negative associations with negative affect and depressive symptoms are also statistically significant but with lower correlation (-0.2—0.3)[34, 58, 59]. Denovan 2017a[34] in a longitudinal study found that the association between psychological strengths and positive mental wellbeing was not static and not all the strengths remained significant over time. The only factors that remained significant during the transition period were self-efficacy and optimism, remaining statistically significant as they started university and 6 months later (Figure 2 illustrates these variables).

Only one study[63] explored family factors associated with the development of psychological strengths that would equip young people as they managed the challenges and stressors encountered during the transition to higher education. Lloyd et al (2014) found that perceived maternal and paternal acceptance made significant and unique contributions to students' psychological adjustment. Their research methods are limited by their reliance on retrospective measures and self-report measures of variables, and these results could be influenced by recall bias.

These psychological strengths have been targeted for research amongst students due to their importance in moderating the harmful impact of stress. Stress is seen as a playing a key role in the development of poor mental health for students in higher education. Theoretical models and empirical studies have suggested that increases in stress are associated with decreases in student mental health[29, 34]. Students at university experience the well-recognised stressors associated with academic study such as exams and course work. However, perhaps less well recognised are the processes of transition, requiring adapting to a new social and academic environment (Fisher 1994 cited by Denovan 2017a)[34]. Por et al (2011)[55] in a small (n=130

prospective survey found a statistically significant correlation between higher levels of emotional intelligence and lower levels of perceived stress (r=0.40). Higher perceived stress was also associated with negative affect in two studies[34, 55], and strongly negatively associated with positive affect (correlation -0.62)[59].

Two studies[43, 66] considered the impact of how individuals view themselves on poor mental health. One study considered the impact of self-esteem and the association with non-accidental self-injury (NSSI) and suicide attempt amongst 734 University students. As rates of suicide and NSSI are higher amongst LGBT students, the prevalence of low self-esteem was compared. There was a low but statistically significant association between low self-esteem and NSSI, though not for suicide attempt. A large survey, including participants from seven universities (El Ansari 2014b)[43] compared depressive symptoms in students with marked body image concerns, reporting that the risk of depressive symptoms was greater (OR 2.93) than for those with lower levels of body image concerns.

Autistic students may display social communication and interaction deficits that can have negative emotional impacts. This may be particularly true during young adulthood, a period of increased social demands and expectations. Jackson & Dritschel (2016)[48] found in a survey of 230 university students that those with autism had a low but statistically significant association with poor social problem-solving skills and depression (B=0.24 **, 0.35**).

Table7: Definition of Psychological Variables

Variable	Definition
Academic self-efficacy	Academic self-efficacy refers to a belief in one's ability to achieve desired results from one's behaviour in academic settings (Solberg et al. 1993). Students high in academic self-efficacy perceive tasks, difficulties, and setbacks as challenges to be overcome rather than threats (Schwarzer 1992).
Adaptability Holliman	adaptability has been conceptualised as the extent to which an individual is able to adjust and modify (manage) cognitive (thoughts), behavioural (actions) and emotional (affective) functioning in the face of changing, novel and uncertain circumstances, situations or conditions (Martin et al., 2012, 2013). In the Lloyd study, psychological adjustment isn't defined. It is measured using the Personality Assessment Questionnaire (Rohner 2005)
Body image	El Ansari 2014b Body image is the mental image we have of the size, shape and contour of our own bodies as well as of our feelings about these characteristics and the parts that constitute our bodies
Coping	Lazarus and Folkman's (1984) transactional model of coping proposes that individuals employ either problem-focused or emotion-focused coping strategies. Problem-focused strategies involve active attempts to reduce stressors and include defining the problem, generating alternative solutions and considering their relative costs and benefits. Emotion-focused strategies seek to lessen the emotional distress associated with a situation through trying to change one's feelings about it and include positive re-appraisals and seeking social support. According to the transactional model, both types of strategies are helpful in managing stress and individuals may use a range of different strategies over the course of a stressful situation. Carver et al. (1989) have identified a third set of dysfunctional coping strategies, which include focusing on and venting of emotions, denial, behavioural disengagement, mental disengagement and alcohol or drug use.
Emotion regulation	Coping involves regulation of emotions. Gross (2002) proposes that how a person control expresses, and manages their emotions plays a very important role in how they cope and respond to stress. People use two main emotion-regulation strategies: reappraisal (which can be adaptive) and suppression (which can be maladaptive).
Emotional Intelligence	EI is a type of social intelligence that involves a person's ability to monitor their own and others' emotions, to discriminate among them and to use that information to guide their thinking and actions. Nightingale's (2012) study considers two aspects of EI 1) Emotion related cognitive ability – the ability to perceive, use, understand, and regulate emotion and 2) behavioural dispositions and self-perceptions of one's ability to recognize and understand emotions. Both are linked to adaptive functioning and both promote positive ways of coping in stressful situations.
Grit	"perseverance and passion for long-term goals" it involves "working strenuously towards challenged, maintaining effort and interest over years despite failure, adversity, and plateaus in progress." Duckworth et al (2007
Hope	Hope is similar to dispositional optimism in assuming future outcomes are influenced by goal-oriented cognitions (agency thinking) (Snyder 1994). However, hope theory is equally concerned with an individual's perceived capability to develop a pathway to achieve a goal (Snyder and Lopez 2005).
Optimism	Optimism is defined in relation to Carver and Scheier's (2001) dispositional optimism as a generalised positive outcome expectancy. Individuals who possess positive expectations about future conduct are viewed to believe good outcomes will happen, perceive these outcomes as attainable, and persevere in goal-oriented efforts (Carver and Scheier 2001).

Positive psychology	Positive psychology is a theoretical approach that focusses on positive individual traits, valued subjective experiences, and positive institutions (Seligman and Csikszentmihalyi 2000); it emphasises an understanding of the processes and factors that contribute to the health, success, and flourishing of individuals. Within positive psychology, happiness has been shown to equate with measures of subjective well-being (SWB) (Pavot and Diener 2008). SWB consists of three components; emotional reactions to events (positive affect and negative affect), and cognitive appraisal of fulfilment and satisfaction.
Resilience	Psychological resilience is defined as the ability to recover from adversity and react adaptively to stressful situations (Masten, 2009), and is a core component of psychological well-being (Ryff & Singer, 2003). Resilience has been defined in various ways but most commonly as the ability to bounce back following negative emotional experiences, and demonstrating flexibility in response to changing situational demands (see Fletcher & Sarkar, 2013). Resilience concerns positive adaptation despite the presence of risk or adversity (Luthar & Cicchetti, 2000). Research suggests that resilient individuals possess an optimistic and energetic approach to life and are characterised by high positive emotionality (Tugade & Fredrickson, 2004). However, positive emotions are not simply by-products of resilient thinking, they also enable resilient individuals to use creative and adaptive ways of coping ('sustainers' of coping effort) and provide respite from the negative emotions in the stressful experience (Tugade & Fredrickson, 2004).
Self esteem	Taylor 2020 Self-esteem, encompassing the extent to which a person accepts, likes, or is satisfied with themselves
Self-control	Self-control is the ability to exercise restraint over behaviour to meet long-term interests. Tangney et al. (2004) found students higher in self-control had better academic performance and displayed better psychological adjustment.
Self-talk	Self-determination theory proposes that informational versus controlling interpretations of intra-personal events have positive and negative implications, respectively, for well-being. Self-talk represents an intra-personal event that could be interpreted as informational or controlling and may attenuate or exacerbate the negative effects of a stressful experience.

Table 8: Measurement tools and correlations

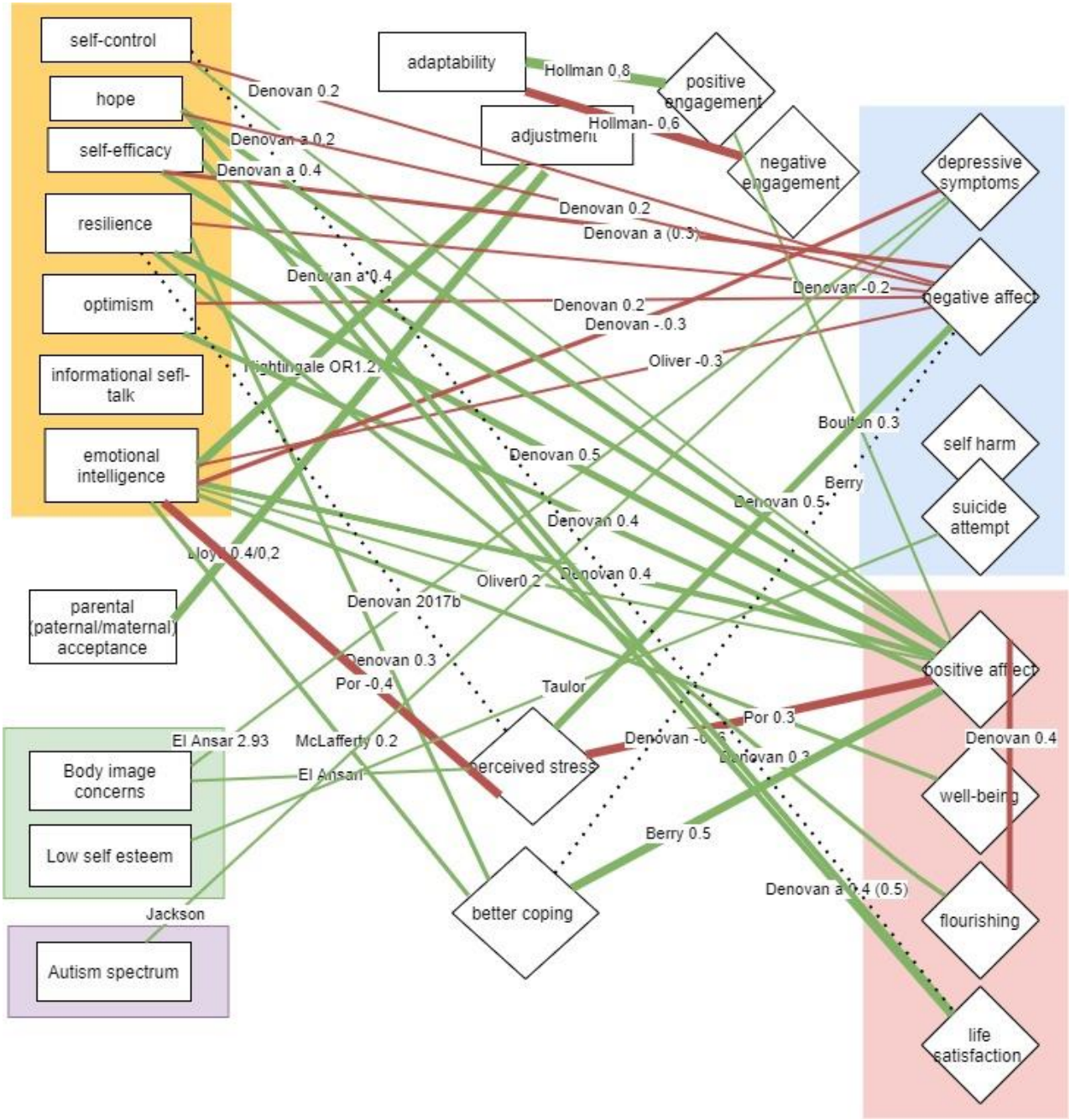
Study	Variables and measurement tools	Associations
Kannangara (2018)[71]	**Grit** 12-item Grit Scale that was developed by Duckworth et al. (2007) **Perceived stress** Perceived Stress Scale (PSS) (Cohen et al., 1983) **Mental Wellbeing** Mental Well-being Scale (Short Warwick–Edinburgh Mental Well-being Scale) **Personal Well-being** (Office for National Statistics, 2011) **Self-Control Scale (SCS)** (Tangney et al., 2004)	Grit – self-control r=0.52 p< 0.001 Grit – wellbeing r = 0.38 p< 0.001 Grit – perceived stress r= -0.11 p<0.05
Holliman (2018)[35] longitudinal N=186 N=1	**Adaptability** Adaptability Scale (Martin et al., 2013) **Engagement** Behavioural engagement Motivation and Engagement Scale – University/College (MES-UC) (Martin, 2007b)	Adaptability – positive engagement 0.77 *** Adaptability – negative engagemtn-0.62 *** Adaptability - Negative engagement – 0.28 *
Lloyd (2014) [63] survey N=315 N=3	**Adjustment to university** Personality Assessment Questionnaire (adult PAQ) **Parenting** Parental Acceptance–Rejection Questionnaire, short form (adult PARQ: Father and mother versions) (Rohner, 2005). Parental Power–Prestige Questionnaire, adult version (3PQ)	Perceived Maternal acceptable – psychological adjustment 0.18 p≤ 0.01 Perceived Paternal acceptance 0.35 p≤ 0.01
Nightingale (2013)[37] Longitudinal N=331 N=1	**Adjustment to university** The College Adaptation Questionnaire (CAQ; Crombag, 1968; Vlaander & van Rooijen, 1981) **Emotional intelligence** The Situational Test of Emotion Management (STEM: MacCann & Roberts, 2008) The Emotional Self-Efficacy Scale (ESES: Kirk et al., 2008)	Higher emotional management and self-efficacy scores were both significantly associated with high adjustment. high stable adjustment vs low stable adjustment Emotion management OR 1.27 p = 0.006 Emotional stability factors 1-4 OR 1.21-1.70 Statistically significant
Denovan (2017b)[59] survey N=202 N=1	**Resilience** Ego-Resiliency Scale (Block & Kremen, 1996) **Stress** The perceived stress scale (PSS) (Cohen & Williamson, 1988) **Positive affect**	Resilience – positive affect 0.49 Positive affect – perceived stress -0.62 Resilience – leisure coping beliefs 0.29 Resilience – flourishing – 0.34

	Positive and Negative Affectivity Schedule (Tugade & Fredrickson, 2004)	
Denovan (2017a)[34] longitudinal N=192 N=1	**Resilience** Resilience Scale (Neill and Dias 2001) **Optimism** The Life Orientation Test–Revised (Scheier et al. 1994) **Hope** The Trait Hope Scale (Snyder et al. 1991) **Self-Control** The Brief Self-Control Scale (BSCS) (Tangney et al. 2004) **Self-Efficacy** The College Self-Efficacy Inventory (CSEI) (Solberg et al. 1993) **Stress** The Inventory of College Students' Recent Life Experiences (ICSRLE) (Kohn et al. 1990) **Subjective Well-Being** The Satisfaction with Life Scale (SWLS) (Diener et al. 1985) The Positive and Negative Affectivity Schedule (Watson et al. 1988)	Time 1 data (Time 2 data) Resilience – life satisfaction 0.48** (0.28**) Resilience – positive affect 0.52** (0.14**) Resilience – Negative affect -0.23 **(NS) Optimism - life satisfaction 0.42** (0.43**) Optimism – positive affect 0.41** (0.24**) Optimism – negative affect -0.32 ** (-0.31**) Stress – life satisfaction -0.36** (-0.53**) Stress – positive affect NS (-0.42**) Stress – negative affect 0.47 ** (0.53**) Hope – life satisfaction 0.42** (0.25**) Hope – positive affect 0.52** (NS) Hope – negative affect -0.22** (NS) Self-control - – life satisfaction NS (NS) Self-control – positive affect 0.21** (NS) Self-control – Negative affect -0.16* (-0.16*) Self-efficacy - – life satisfaction 0.40** (0.52**) Self-efficacy – positive affect 0.39**(0.32**) Self-efficacy – Negative affect -0.26**(-0.25**)
Berry (2012)[52]	**Coping** The Coping Orientations to Problems Experienced scale (COPE; Carver et al., 1989) measures the strategies people use to respond to difficult or stressful events in their lives. **Positive /Negative affect** The Positive and Negative Affect Scale (PANAS; Watson et al., 1988)	Coping-Positive affect R= 0.47 p= <0.001 /r= 0.38 p= 0.004 Coping – negative affect NS
Por (2011)[55] Prospective survey N=130 N= NR	**Emotional Intelligence** The Schutte Emotional Intelligence Scale (SEIS) (Schutte et al., 1998) **Perceived Stress** The Perceived Stress Scale (PSS-10) (Cohen et al., 1983) **Coping**	EI – perceived stress -0.40 ** EI – subjective well-being 0.27**

	The Ways of Coping Scale Revised (WCS) (Folkman and Lazarus, 1986) **Satisfaction with life** The Satisfaction with Life Scale (SWLS) (Diener et al., 1985) Plan-ful problem-solving	
McLafferty (2019)[51] Survey N=739 N=1	**Emotion regulation** Emotion Regulation Questionnaire (Gross & John, 2003) Reappraisal Suppression **Coping** Adapted from the Hurricane Katrina Community Advisory Group Survey (Kessler, Galea, Jones, & Parker, 2006), with Item (c) developed for the Army STARRS (Ursano, 2012).	Better coping - high reappraisal 0.19 ***p<0.001 Better coping – low suppression -.011**p<0.01
Oliver (2010)[58] Survey N=146 N=1	**Informational self-talk *** **Controlling self-talk** 17 items were generated to assess controlling and informational self-talk. UNVALIDATED **Positive affect** International Positive and Negative Affect Scale Short Form (I-PANAS-SF; Thompson, 2007) **Anxiety** International Positive and Negative Affect Scale Short Form (I-PANAS-SF; Thompson, 2007) State-Trait Anxiety Inventory	[1]informational self-talk- positive affect **0.19* p<0.05** informational self-talk – negative affect **-0.29**p<0.01** informational self-talk – state anxiety **-0.25 p<0.01** controlling self-talk **–** positive affect **0.37** p<0.01** controlling self-talk- negative affect**-0.087 NS** controlling self-talk – state anxiety **-0.92 NS**
El Ansari (2014b)[43] Survey N=3706 N=7	**Body image Concern** Body Shape Questionnaire – 8 items **Depressive symptoms** Modified Beck Depression Inventory (M-BDI) **Perceived stress** Perceived Stress Scale (PSS-4)	Body image concern- Depressive symptoms Positive and significant (OR 2.93) students with higher number of depressive symptoms were 2.93 time more likely than those with lower number of depressive symptoms to have marked BIC Body image concerns – Higher Perceived stress Positive and significant OR 1.33 (students with higher perceived stress were 1.33 times more

		likely than those with lower perceived stress to have marked BIC)
Taylor (2020)[66] survey N=210 (LGBTQ) N=2	**Thwarted belongingness.** Thwarted belongingness was assessed with 7-items taken from the Interpersonal Needs Questionnaire (Van Orden, Cukrowicz, Witte, & Joiner, 2012). **Self- esteem (perceived burdensomeness)** Five items drawn from the Internal Protective subscale of the Suicide Resilience Inventory 25 (SRI-25; Osman et al., 2004) **Non-suicidal self-injury.** **Suicide attempts** **Anxiety and depression** The Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983)	Non-Suicidal Self Injury (NSSI) Suicide attempt (SA) thwarted belongingness – NSSI -0.02 (-0.12, 0.08) NS Thwarted belongingness – SA 0.13 (-0.00, 0.27) NS **Self-esteem – NSSI 0.17 (0.02, 0.33)** Self-esteem – SA 0.08 (-0.01, 0.17) NS This suggests that other variables, not included in this study, may also be important in accounting for the elevated self-harm risk in the LGB population. In particular, it may be that social factors, such as discrimination or marginalization remain important even after these psychological factors are accounted for.
Jackson (2015)[48] Survey N=230 N=multiple	**Autism Spectrum Disorder Phenotype** ASD phenotype expression: Autism-Spectrum Quotient (AQ; Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001) **Social problem-solving** Social problem-solving: social problem-solving inventory—revised (SPSI-R; D'Zurilla, Nezu, & Maydeu-Olivares, 2002). **Depressive symptomology:** Beck' depression inventory, second edition (BDI-II; Beck, Steer, & Brown, 1996)	Autism Spectrum Disorder Phenotype - Depressive symptomology B 0.35** R = 0.12 Autism Spectrum Disorder Phenotype - social problem-solving B=0.25** R=- 0.05 social problem solving – depressive symptomology B= 0.51** R= 0.26

Figure 2: Association of Psychological Variables



Green connectors – positive correlation

Red connectors – negative correlation

Dotted line – non-significant correlation

Line thickness reflects strength of correlation

Mental Health Factors

Four studies[36, 56, 57, 70] investigated mental health variables and their impact on mental health of students in higher education. These included; a family history of mental illness, a personal history of mental illness, mental health literacy, help seeking behaviour and attitudes to mental health.

Students with a family history or a personal history of mental illness appear to have a significantly greater risk of developing problems with mental health at university[56]. Mahadevan et al (2010)[36] found that university students who self-harm have a have a significantly greater risk (OR 5.33) of having an eating disorder than a comparison group of young adults who self-harm but are not students.

University students who lack sufficient mental health literacy skills to be able to recognise problems or where there are attitudes that foster shame at admitting to having mental health problems can result in students not recognising problems and/or failing to seek professional help.[57, 70] Gorcyznski et al (2017)[70] found that women and those who indicated a previous mental health problem exhibited significantly higher levels of mental health literacy. Those with greater overall mental health literacy were more likely to seek help for mental health problems, either in person or through other means. They found that many students struggle with identifying symptoms of mental health problems and that 42.3% of students do not know where to find available resources. Of those indicating an intention to seek help for mental health problems, most preferred online resources, as well as family and friends rather than medical professionals such as GPs.

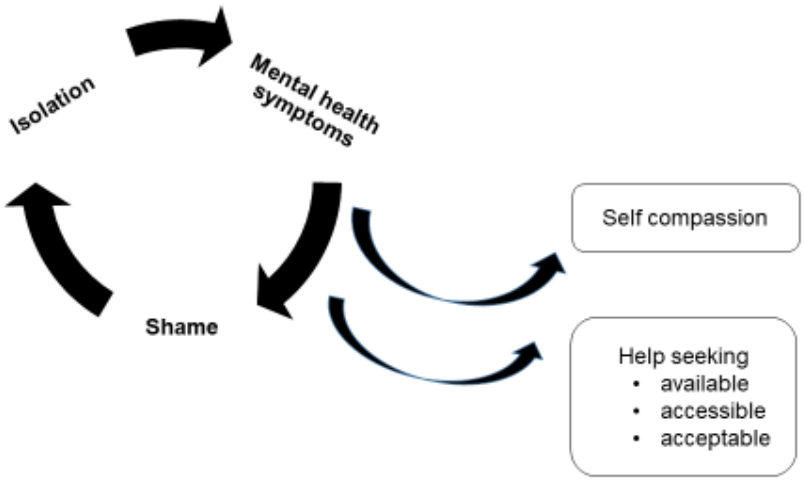
Kotera et al (2019)[57] identified self-compassion as an explanatory variable, reducing social comparison, promoting self-acceptance and recognition that discomfort is an inevitable human experience. The study found a strong significant correlation between self-compassion and mental health symptoms.

There again appears a cycle of reinforcement, where poor mental health symptoms are felt to be a source of shame and become hidden, help is not sough, further isolation ensues leading to further deterioration in mental health. Factors that can interrupt the cycle are self-compassion, leading to more readiness to seek help (see Figure 3).

Table 9: Mental Health Variables

Study	Variables	Outcome
Gorcyznski (2017)[70]	previous mental health problem – distress	Significant positive (F(1378)=57.9, p=0.000)
	help seeking – distress	Significant positive 0.38 p=000
	help seeking – wellbeing	Significant negative -0.02 p=000
	mental health literacy – help seeking	positive 0.1 p=0.017
	mental health literacy – distress	NS
	Mental health literacy – wellbeing	NS
Honney (2010)[56]	family history of depression -depressive symptoms	67%
	no family history of depression - depression (PHQ-9)	42% (p < 0.001).
	past history of depression – depressive symptoms	67%
	no past history of depression – depressive symptoms	37% (p < 0.001).
Mahadevan[36] (2010)	eating disorder – self harm	5.33 (2.2 to 12.8) p= 0.000
Kotera[57] (2019)	negative attitudes to mental illness – mental health symptoms	
	self-compassion – mental illness	-0.6 p<0.01

Figure 3: Mental Illness cycle of reinforcement



Family Factors

Childhood factors – pre-university

Six studies[38, 47, 51, 52, 64] explored the association of a concept that related to a student's experiences in childhood and before going to university (see Table 10). Three studies[38, 51, 64] explored the impact of ACEs (Adverse Childhood Experiences) assessed using the same scale by Feletti (2009)[74] and another explored the impact of abuse in childhood[47]. Two studies examined the impact of attachment anxiety and avoidance[52], and parental acceptance[63]. The studies measured different mental health outcomes including; positive and negative affect, coping, suicide risk, suicide attempt, current mental health problem, use of mental health services, psychological adjustment, depression and anxiety.

The three studies that explored the impact of childhood trauma (ACE's) all found a significant and positive relationship with poor mental health amongst university students. O'Neill et al (2018) in a longitudinal study (n=739) showed that there was in increased likelihood in self-harm and suicidal behaviours in those with either moderate or high levels of childhood adversities (OR:5.5 to 8.6)[38]. McIntyre et al (2018) (n=1135) also explored the impact of childhood trauma through multiple regression analysis with other predictive variables. They also found that childhood trauma is significantly positively correlated with anxiety, depression and paranoia (ß =0.18, 0.09, 0.18) though the association is not as strong as the correlation seen for loneliness (ß=0.40)[64]. McLafferty et al (2019) explored the compounding impact of childhood adversity and negative parenting practices (over-control, overprotection and overindulgence) on poor mental health (depression OR 1.8, anxiety OR 2.1 suicidal behaviour OR 2.3, self-harm OR 2.0).

Gaan et al's (2019) survey of LGBTQ students (n=1567) found in a multivariate analyses that sexual abuse and other abuse from violence from someone close and being female had the highest odds ratios for poor mental health and were significantly associated with all poor mental health outcomes[47].

While childhood trauma and past abuse poses a risk to mental health for all young people it may place additional stresses for students at university. Entry to university represents life stage where there is potential exposure to new and additional stressors, and the possibility that these students may become more isolated and find it more difficult to develop a sense of belonging. Students may be separated for the first time from protective friendships. However, the mechanisms that link childhood adversities and negative psychopathology, self-harm and suicidal behaviour are not clear [51]. McLafferty et al (2019) also measured the ability to cope and these are not always impacted by childhood adversities[51]. They suggest that some children learn to cope and build resilience that may be beneficial.

McLafferty et al (2019)[51] also studied parenting practices. Parental over-control and over-indulgence was also related to significantly poorer coping (OR -0.075 p<0.05) was related to developing poorer coping scores (OR -0.21 p< 0.001)[51]. These parenting factors only became risk factors when stress levels were high for students at university. It should be noted that these studies used self-report and responses regarding views of parenting may be subjective and open to interpretation.

Table 10: Family factors

Study	Variable A	Mental Health variable	Correlation (r), regression (ß) and or relative risk (OR)
Berry (2012)[52]	Coping (problem and emotion focused coping)	Attachment avoidance	r=-0.42, p=0.002
	Coping	Attachment anxiety	NS
	Dysfunctional coping	Attachment anxiety	r 0.51 <.001
	Dysfunctional coping	Attachment avoidance	NS
	Attachment anxiety	Positive affect	r -32, p.016
	Attachment anxiety	negative affect	NS
	Attachment avoidance	Positive affect	NS
	Attachment avoidance	negative affect	0
Gnan (2019)[47]	Sexual abuse	Current mental health problem	OR 2.27(1.65–3.13), p<0.0005
	Sexual abuse	Suicide risk	OR 2.05(1.44–2.92), p<0.0005
	Sexual abuse	Use of mental health services	OR 1.96(1.43–2.70), p<0.0005
	Sexual abuse	Self-harm	OR 1.83(1.29–2.59), p<0.005
	Other abuse or violence	Current mental health problem	OR 1.81(1.36–2.39), p<0.0005
	Other abuse or violence	Suicide risk	OR 2.40(1.85–3.15), p<0.0005
	Other abuse or violence	Use of mental health services	OR 2.09(1.62–2.70), p<0.0005
	Other abuse or violence	Self-harm	OR 2.62 (1.99–3.44), p<0.0005
Lloyd (2014)[63]	Parental power Parental prestige Parental acceptance	Psychological adjustment	perceived maternal and paternal acceptance made significant and contributions to students' psychological adjustment.
McIntyre (2018)[64]	Childhood disadvantage	Depression	ß 0.18**p<0.01
		Anxiety	ß 0.09***
		Paranoia	ß 0.18***
	Childhood trauma	Depression	ß 0.18*** P<0.001
		Anxiety	ß 0.17***
		Paranoia	ß 0.18***
McLafferty (2019)[51]	Childhood adversities	Better coping	NS
	Moderate-Risk × Stress	Lifetime MDE	OR 1.36**
		Lifetime GAD	OR 1.24*
		Suicidal behaviour	OR 1.56***
		Self-harm	OR 1.30**

	Childhood adversities High-Risk × Stress Parenting practices Overcontrol × Stress Over-protection × Stress Over-indulgence × Stress	Better coping Lifetime MDE Lifetime GAD Suicidal behaviour Self-harm Better coping Lifetime MDE Lifetime GAD Suicidal behaviour Self-harm Better coping Lifetime MDE Lifetime GAD Suicidal behaviour Self-harm Better coping Lifetime MDE Lifetime GAD Suicidal behaviour Self-harm	NS OR 1.76* OR 2.08** OR 2.32** OR1.96** NS NS OR 1.13*** NS OR 1.08* OR −0.15*** NS NS NS NS OR −.07* OR 1.11*** OR 1.13*** OR 1.07*
O'Neill (2018)[38]	ACEs (high risk)	 Self-harm Suicide ideation Suicide attempt	High risk vs low risk OR 5.53** OR 8.58*** OR 7.95***

*p<0.05. **p<0.01. ***p<0.001.

Social Networks

Eight studies [36, 37, 47, 55, 59, 64, 66, 67] examined the concepts of loneliness and social support and its association with mental health in university students. One study also included students at Higher Ed Institutions[47]. Seven of the studies were surveys, and one was a retrospective case control study to examine the differences between university students and age matched young people but non-university students who attended hospital following deliberate self-harm[36].

Included studies demonstrated considerable variation in how they measured the concepts of social isolation, loneliness, social support and a sense of belonging. There were also differences in the types of outcomes measured to assess mental wellbeing and poor mental health. (see Table 11). Grouping the studies within a broad category of 'social factors' therefore represents a limitation of this review given that different aspects of the phenomena may have been being measured. The tools used to measure these variables also differed. Only one scale (The UCLA loneliness scale) was used across multiple studies [37, 64, 67]. Diverse mental health outcomes were measured across the studies including positive affect, flourishing, self-harm, suicide risk, depression, anxiety and paranoia.

Three studies[37, 40, 64] measuring loneliness, two longitudinally[37, 40], found a consistently positive association between loneliness and poor mental health in university students. Greater loneliness was linked to greater anxiety, stress, depression, poor general mental health,

paranoia, alcohol abuse and eating disorder problems. The strength of the correlations ranged from 0-3-0.4 and were all statistically significant (see Table 11). Loneliness was the strongest overall predictor, of those measured, of mental distress. A strong identification with university friendship groups was most protective against distress relative to other social identities[64]. Whether poor mental health is the cause, or whether it is the result of loneliness was explored further in the studies. The results suggest that for general mental health, stress, depression and anxiety, loneliness induces or exacerbates symptoms of poor mental health over time[40, 64]. The feedback cycle is evident, with loneliness leading to poor mental health which leads to withdrawal from social contacts and further exacerbation of loneliness.

Factors associated with protecting against loneliness by fostering supportive friendships and promoting mental wellbeing were also identified. Beliefs about the value of 'leisure coping', and attributes of resilience and emotional intelligence had a moderate, positive and significant association with developing mental wellbeing and were explored in three studies[55, 59, 68].

Denovan et al (2017b)[59] explored leisure coping, and its psychosocial functions and its relationship with mental wellbeing. An individual's beliefs about the benefits of leisure activities to manage stress, facilitate the development of companionship, enhance mood were positively associated with flourishing and were negatively associated with perceived stress. Resilience was also measured. Resilience was strongly and positively associated with leisure coping beliefs and with indicators of mental wellbeing. The authors conclude that resilient individuals are more likely to use constructive means of coping (such as leisure coping to proactively cultivate positive emotions which counteract the experience of stress and promote wellbeing. Leisure coping is predictive of positive affect which provides a strategy to reduce stress and sustain coping. The belief that friendships acquired through leisure provide a social of support is an example of leisure coping belief. Strong emotionally attached friendships that develop through participated in shared leisure pursuits are predictive of higher levels of well-being. Friendship bonds formed with fellow students at university are particularly important for maintaining mental health and opportunities need to be developed and supported to ensure that meaningful social connections are made.

The 'broaden-and-build theory' (Fredickson 2004[75] cited by[59]) may offer an explanation for the association seen between resilience, leisure coping and psychological wellbeing. The theory is based upon the role that positive and negative emotions have in shaping human adaptation. Positive emotions broaden thinking, enabling the individual to consider a range of ways of dealing with and adapting to their environment. Conversely negative emotions narrow thinking and limit option for adapting. The former facilitates flourishing, facilitating future wellbeing. Resilient individuals are more likely to use constructive means of coping which generate

positive emotion (Tugade & Fredrickson 2004[76], cited by[59]). Positive emotions therefore lead to growth in coping resources, leading to greater well-being.

The transition to and first year at university represent critical time when friendships are developed. Thomas et al (2020)[49] explored the factors that predict loneliness in the first year of university. A sense of community and higher levels of 'social capital' were significantly associated with lower levels of loneliness. 'Social capital' scales measure the development of emotionally supportive friendships and the ability to adjust to the disruption of old friendships as students transition to university. Students able to form close relationships within their first year at university are less likely to experience loneliness (r-0.09, r-0.36, r-0.34).

Young adults at university and in higher education are facing multiple adjustments. Their ability to cope with these is influenced by many factors. Supportive friendships and a sense of belonging are factors that strengthen coping. Nightingale et al (2012) undertook a longitudinal study to explore what factors were associated with university adjustment in a sample of first year students (n=331).[37] They found that higher skills of emotion management and emotional self-efficacy were predictive of stable adjustment. These students also reported the lowest levels of loneliness and depression. This group had the skills to recognise their emotions and cope with stressors and were confident to access support. Students with poor emotion management and low levels of emotional self-efficacy may benefit from intervention to support the development of adaptive coping strategies and seeking support.

The positive and negative feedback loops

The relationship between the variables described appeared to work in positive and negative feedback loops with high levels of social capital easing the formation of a social network which acts as a critical buffer to stressors (see Figure 4). Social networks and support give further strengthening and reinforcement, stimulating positive affect, engagement and flourishing. These, in turn, widen and deepen social networks for support and enhance a sense of wellbeing. Conversely young people who enter the transition to university/higher education with less social capital are less likely to identify with and locate a social network, isolation may follow, loneliness, anxiety, further withdrawal from contact with social networks and learning and depression.

Figure 4: The positive and negative feedback loops

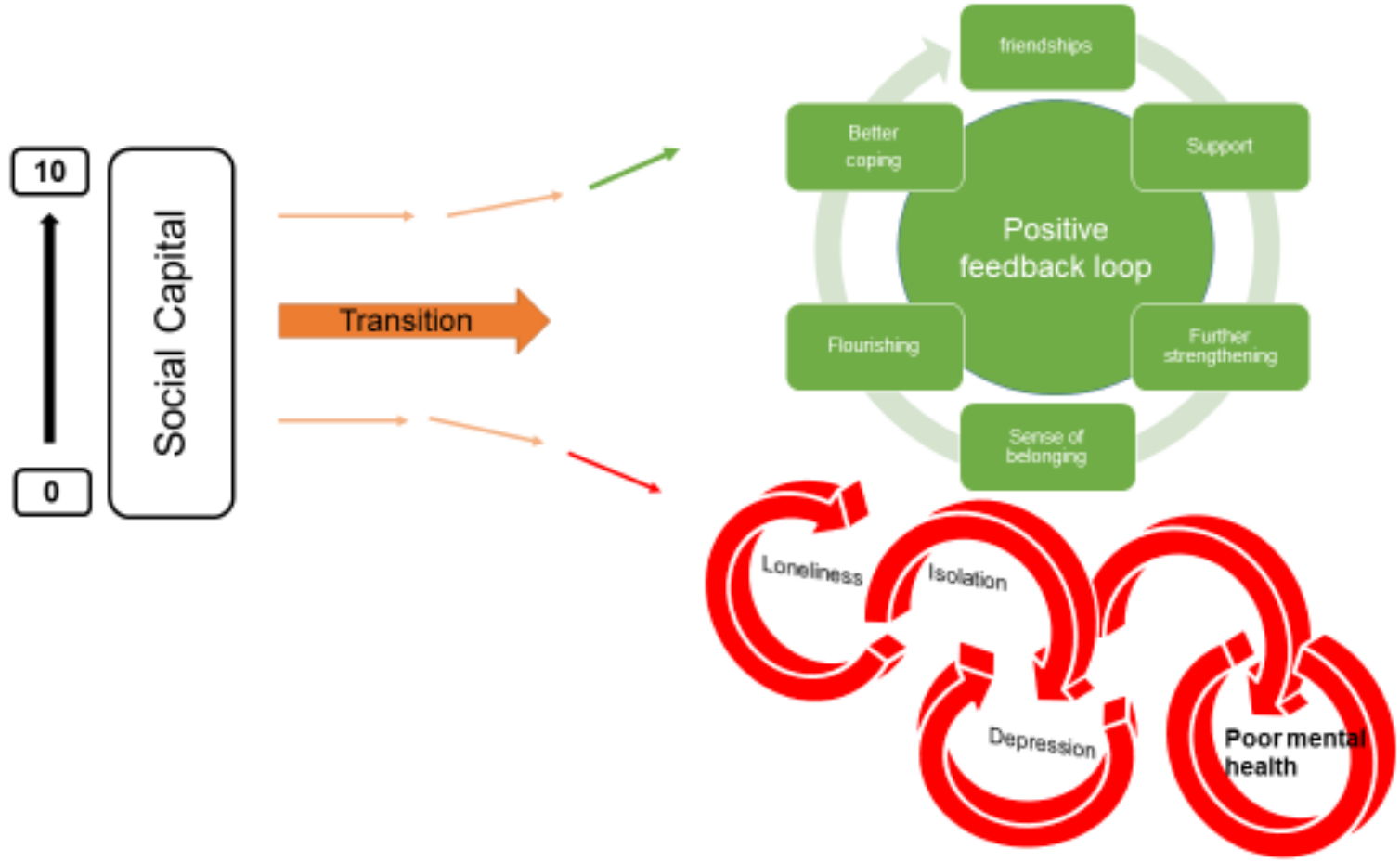


Table 11: Social factors at university

Study	Social factor variable – mental health variable	Association (correlation r) or risk (odds ratio OR)
Denovan (2017b)[59]	leisure coping beliefs- positive affect leisure coping beliefs- flourishing leisure coping beliefs- perceived stress	r 0.16 p<0.05 r 0.18 p<0.05 r 0.10 NS
Gnan (2019)[47]	social support – use of MH services social support – self harm social support – suicide risk	NS OR 1.43(1.12–1.82), p<0.005 NS
Mahadevan (2008)[36]	Difficulties in relationship with parents – self harm Difficulties in relationship with partners – self harm Difficulties in relationship with friends – self harm Social isolation – self harm	OR 0.49 (0.32 to 0.75) p=0.001 OR 0.46 (0.30 to 0.69) p=0.000 OR 2.56 (1.48 to 4.41) p=0.001 OR 0.89 (0.55 to 1.44) p=0.623
McIntyre (2018)[64]	loneliness (UCLA scale) - depression loneliness (UCLA scale) - anxiety loneliness (UCLA scale) - paranoia	r 0.42 P<0.001 r 0.39 P<0.001 r 0.40 P<0.001
McLafferty (2019)[51]	social support before 18 - better coping	r 0.12 P<0.001
Nightingale (2013)[37]	Higher adjustment scores – loneliness (UCLA scale) Higher adjustment scopes – depression	r 0.23 p>0.001 r 0.26 p>0.001
Por (2011)[55]	seeking social support – emotional intelligence	0.19, p<0.05
Richardson (2017a)[40]	loneliness – depression loneliness – perceived stress loneliness – anxiety	Time 4: r 0.4 Time 4: r 0.4 Time 4: r 0.3
Taylor (2020)[66]	Belongingness – NSSI Thwarted belongingness – suicide attempt Self-esteem – NSSI Self esteem – SA	r -0.02 (-0.12, 0.08) NS r 0.13 (-0.00, 0.27) NS r 0.17 (0.02, 0.33) r 0.08 (-0.01, 0.17) NS
Thomas (2020)[67]	Maintained Social Capital – loneliness (UCLA scale) Bridging social capital – loneliness (UCLA scale) Bonding Capital = loneliness (UCLA scale)	r -0.9* p <.05. r -0.36** p <.01 r -0.34** p <.01
Tyson (2010)[68]	engagement in physical activity – anxiety and depression	r -0.607, n=100, p=0.01

L: longitudinal OR: odds ratio

University variables

Eleven studies[32, 35, 36, 39, 56, 59, 62, 64, 65, 67, 69] explored university variables, and their association with mental health outcomes. The range of factors and their impact on mental health variables is limited and there is little overlap (see Table 12). Knowledge gaps are highlighted by factors highlighted by our PPI group as potentially important but not identified in the literature (see Box 2). It should be noted that these may reflect the focus of our review, and our exclusion of intervention studies which may evaluate university factors. Box 1 also gives an example of interventions that may have been developed and introduced within universities.

High levels of perceived stress caused by exam and course work pressure was positively associated with poor mental health and lack of wellbeing [32, 36, 59]. Other potential stressors including financial anxieties and accommodation factors appeared to be less consistently associated with mental health outcomes[36, 39, 40, 56, 64]. Important mediators and buffers to these stressors are coping strategies (conceptual model figure 7, p. 83) and supportive networks (see conceptual model figure 7 p. 83)

Engagement with learning activities was strongly and positively associated with characteristics of adaptability[35] and also happiness and wellbeing[32] (see Figure 5). Boulton et al (2019)[32] undertook a longitudinal survey of undergraduate students at a campus-based university. They found that engagement and wellbeing varied during the term but were strongly correlated. Engagement occurred a wide range of actives and behaviours. The authors suggest that the strong correlation between all forms of engagement with learning has possible instrumental value for the design of systems to monitor student engagement. Monitoring engagement might be used to identify changes in behaviour of individual to assist tutors in providing support and pastoral care. Students also were found to benefit from good induction activities by the university. Greater induction satisfaction was positively and strongly associated with a sense of community at university and with lower levels of loneliness[67].

The inter-related nature of these variables is depicted in Figure 5. Greater adaptability is strongly associated with more positive engagement in learning and university life. More engagement is associated with mental wellbeing.

Box 1

Nottingham Trent University (example cited in Boulton et al (2019)[32])

The predictive analytics project calculates engagement scores based on five online resources (VLE access, library usage, attendance, assignment submission and card swipes) – information is communicated to students and staff has been used to provide more targeted support to students from pastoral tutors.

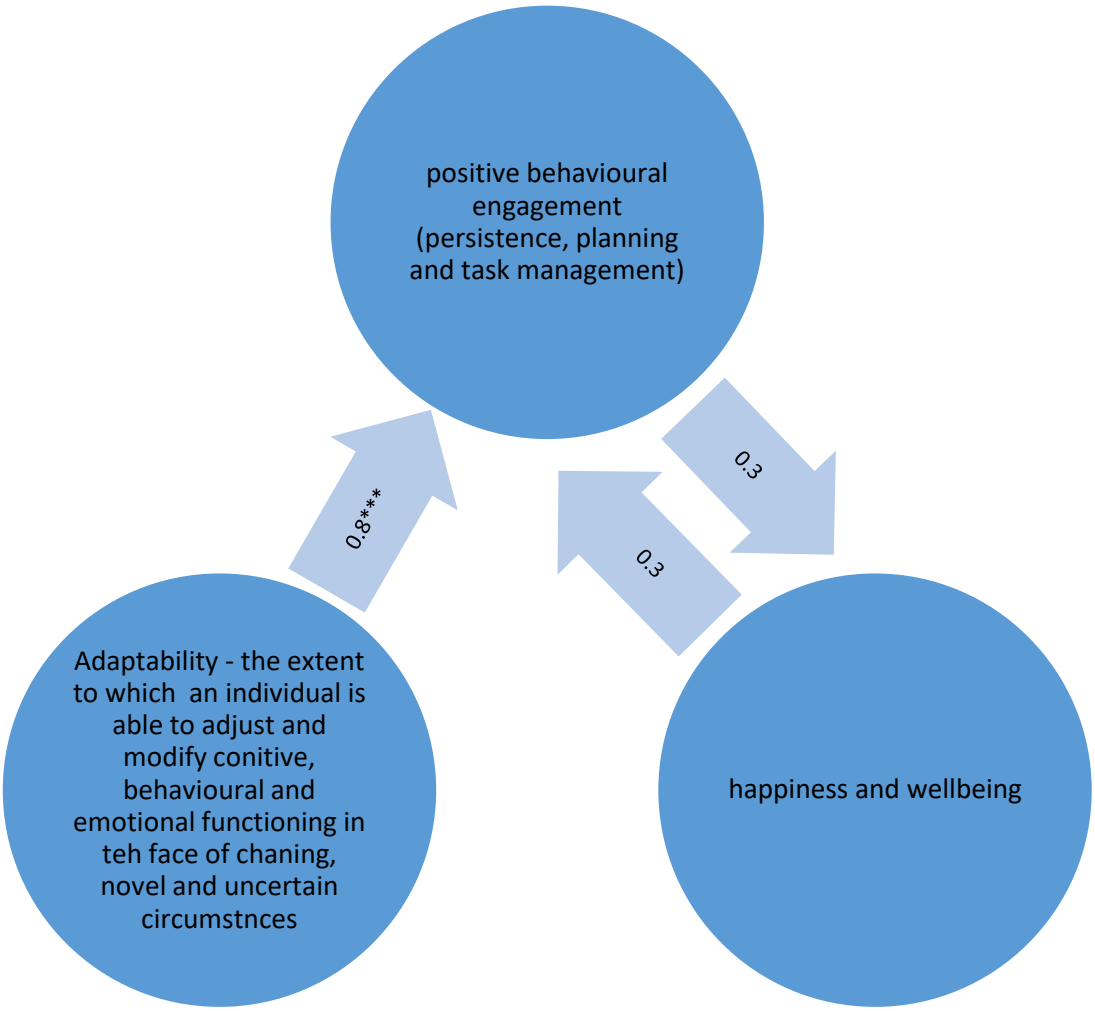


Figure 5: Engagement and wellbeing

Table 12: University based variables

	Exam stress/perceived stress	**Participation in learning**	**Financial factors**	**Accommodation**	**Good induction**
Aceijas (2017)[69]			marginal but significant		
Mahadevan (2010)[36]	yes		NS	NS	
Boulton (2019)[32]	positive affect -0.6	happiness 0.3 wellbeing			
Denovan (2017b)[59]	yes				
Holliman (2018)[35]		adaptability 0.8***			
Honney (2010)[56]			NS		

Jessop (2020)[62]			mental health -0.08		
McIntyre (2018)[64]	depression 0.2		depression 0.1	NS	
Thomas (2010)6[7]					loneliness -0.6
Richardson (2015)[39]			NS		

***p<0.001

Box 2

Variables highlighted by the PPI group

- Low morale for BAME groups 'all the cleaners were black and the lecturers were white'
- Lack of of help with learning basic skills like - how to write essays access research
- Some teaching models make it difficult to integrate
- Loss of support
- Have to take responsibility for your own health
- Peer pressure to say 'it's amazing'
- Health and wellbeing services are hard to see, hard to access or unhelpful
- Competitive toxic environments

Health Behaviours at university

Five studies[36, 43, 45, 54, 59, 68] examined how lifestyle behaviours might be linked with mental health outcomes. The studies looked at leisure activities[59, 68], diet[43], alcohol use[36, 43, 45] and sleep[54].

Depressive symptoms were independently associated with problem drinking and possible alcohol dependence for both genders but were not associated with frequency of drinking and heavy episodic drinking. Students with higher levels of depressive symptoms reported significantly more problem drinking and possible alcohol dependence[45]. Mahadevan et al (2010)[36] compared students and non-students seen in hospital for self-harm and found no difference in harmful use of alcohol and illicit drugs.

Poor sleep quality and increased consumption of unhealthy foods were also positively associated with depressive symptoms and perceived stress[43]. The correlation with dietary behaviours and poor mental health outcomes was low, but also confirmed by the negative correlation between less perceived stress and depressive symptoms and consumption of a healthier diet (see Table 13).

Physical activity and participation in leisure pursuits were both strongly correlated with mental wellbeing (r=0.4)[59], and negatively correlated with depressive symptoms and anxiety (r=-0.6, -0.7)[68].

Table 13: Lifestyle factors.

Study	Lifestyle variables – mental health outcomes	Result
Aceijas (2017)[69]	unbalanced diet = low mental being financial difficulties – low mental being lack of help-seeking behaviour - low mental wellbeing	OR 1.7 (1.1-2.7) p =0.03 r 0.04 (0.4 to 0.9) marginal but statistically significant OR 3.7 (2.0-6.9) p=0.00
Denovan (2017b)[59]	Leisure pursuits – beliefs and strategies. Beliefs represent individuals generalised beliefs that leisure engagement helps to manage stress. Strategies related to how people use leisure pursuits to cope with stress and are situation-based behaviours for reducing stress	r 0.39 *** flourishing r 0.30*** positive affect r -0.11 perceived stress
El Ansari (2014b)[43]	consuming unhealthy food – perceived stress consuming unhealthy food – depressive symptoms healthy food – perceived stress health food – depressive symptoms	r 0,1/NS (F/M) r 0.1/0.2 r -0.1/-0.1 r -0.1/-0.1
El Ansari (2014c)[45]	problem drinking – depressive symptoms alcohol dependence – depressive symptoms	Female: OR 1.03 (1.02–1.04) Male: OR 1.02 (1.01–1.04), Female: OR 1.03 (1.02–1.04), Male: OR 1.03 (1.02–1.05)
Mahadevan (2010)[36]	self-harm – alcohol use	no difference between students and non-students
Norbury (2019)[54]	sleep quality – trait anxiety poor sleep quality – more prevalent in the first year at university	p <0.001 p<0.008
Tyson (2010)[68]	physical activity – Anxiety physical activity – depression	r -0.59 p=0.01 r -0.67 p=0.01

*p < 0.05, ***p < 0.001.

Summary of Quantitative Data

Thirty-six studies measuring the association between a wide range of factors and poor mental health and mental wellbeing were identified and included in this review. We limited our inclusion criteria to studies undertaken in the UK and published within the last decade (2009-2020). Our purpose was to identify the factors that contribute to the growing prevalence of poor mental health amongst students in tertiary level education within the UK. We also aimed to identify factors that promote mental wellbeing and protect against deteriorating poor mental health.

Most of the included studies were cross-sectional in design, with a small number being longitudinal (n=7) (see Table 1), following students over a period of time to observe changes in the outcomes being measured. Two limitations of these sources of data is that they help to understand associations but do not reveal causality. Secondly, we can only report the findings for those variables that were measured, and we therefore have to encourage causation in assuming these are the only factors that are related to mental health. As part of our PPI consultation, we encouraged group members to identify variables that may not have been described within the literature but are important. The factors they identified are described in Figure 6.

Furthermore, our approach has segregated and categorised variables in order to better understand the extent to which they impact mental health. This approach does not sufficiently explore or reveal the extent to which variables may compound one-another, for example, feeling the stress of new ways of learning may not be a factor that influences mental health until it is combined with a sense of loneliness, anxiety about financial debt and a lack of parental support. We have used our PPI group and the development of vignettes of their experiences to seek to illustrate the compounding nature of the variables identified.

The variables were categorised into individual, family, social, university level factors and described following a chronology from pre-university/HE, at transition to university/HE and while at university /HE. The strengths of the association are summarised on Table 14.

At an individual level, factors that were strongly associated with poor mental health outcomes were students who identified as LGBT. The strongly protective factors of a sense of belonging, strong social networks may in part explain the additional vulnerabilities of these students. Factors that appeared to be protective was older age when starting university. The associations where the results were more mixed and where data was lacking included the impact of gender and ethnicity. A wide range of personal traits and characteristics were also explored. Those associated with resilience, ability to adjust and better coping led to improved mental wellbeing. Better engagement appeared as an important mediator to potentially explain the relationship between these two variables. Engagement led to students being able to then tap into those features that are protective and promoting of mental wellbeing. Other important risk factors for poor mental wellbeing that emerged were those students with existing or previous mental illness. Students on the autism spectrum and those with poor social problem solving also were more likely to suffer from poor mental health. Negative self-image was also associated with poor mental health at university. Eating disorders were strongly associated with poor mental wellbeing and were found to be far more of a risk in students at university than in a comparative group of young people not in higher education.

At a family level, the experience of childhood trauma and adverse experiences including, for example, neglect, household dysfunction, abuse, were strongly associated with poor mental health in young people at university. Students with a greater number of 'adverse childhood experiences' were at significantly greater risk of poor mental health than those students without experience of childhood trauma. Parenting styles showed a less strong association with poor mental health, but the evidence suggests that young people's early childhood experiences can influence how they adapt and cope at university.

Loneliness and social isolation were strongly associated with poor mental health and a sense of belonging and a strong support network were strongly associated with mental wellbeing and happiness. These associations were strongly positive in the eight studies that explored them. The reinforcing nature of these variables, with social support providing positive reinforcement, and leading to building of further stronger social support networks, while loneliness and isolation could lead to lack of engagement and further isolation creating a negative spiral of poor mental health. The importance of transition to university was highlighted, with some students managing the transition with greater social capital and finding it therefore easier to enter a positive social support – reinforcement cycle.

Exam and course work pressure was associated with perceived stress and poor mental health. a lack of engagement with learning activities was also associated with poor mental health. A number of variables were not consistently shown to be associated with poor mental health including financial concerns and accommodation factors. Very little evidence related to university organisation or support structures were assessed in the evidence. One study found that a good induction programme had benefits for student mental wellbeing and may be a factor that enables students to become a part of a social network positive reinforcement cycle. Involvement in leisure activities was also found to be associated with improved coping strategies and better mental wellbeing. Students with poorer mental health tended to also have eat in a less healthy manner, to consume more harmful levels of alcohol and experience poorer sleep.

To conclude, a wide range of variables have been examined within the literature, they identify students who will have underlying vulnerabilities to experiencing poor mental health while at university, factors that can be protective or exacerbate poor mental health while at university. The mechanisms that underpin these associations are explored further in the qualitative data presented in the following section.

Table 14: Summary of associations

** number of studies, strength of association += weak association, += medium association +++= strong association

	Description of the Association **Strength of the association** **PMH** **Number of studies** **Consistency across measures** **Consistency across studies**	**	**Mental Wellbeing (MW)**		**Mediators (coping, engagement**	
Demographic variables						
Age >21	Aged less than 21 years is associated with poor mental health	2 ++	Increased age is associated with MW	1 +	Increased age is associated with better coping, emotional intelligence	2 ++
Gender (female)	Women are more likely to experience/report poor mental health	3 ++				
Sexuality *(non-heterosexual)	Non heterosexuals are more likely to experience poor mental health	3 +++				
Pre-university and family						
Attachment anxiety			Higher attachment anxiety is associated with less mental wellbeing	1 ++	Higher attachment anxiety is associated with dysfunctional coping	1 ++
ACEs	Students with more ACEs experience poorer mental health	3 +++				
Abused	Students who experience abuse experience poorer mental health	1+++				
Parental style	Students whose parents were overindulgent experienced poorer mental health	1+	Students whose parents were accepting experienced greater mental wellbeing	1+		
Educational background			Students who had a higher level of educational achievement had higher	1+		

			levels of meotional intelligence			
Psychological Characteristics						
Coping			Students with better coping had higher levels of mental wellbeing	1++		
Social anxiety/ autism	Students with social anxiety, on the autism spectrum or with high levels of body image concerns experienced poorer mental health	3 +++				
Self-determination/esteem	Oliver		Oliver			
Perfectionism/expectations	Students with higher levels of socially prescribed perfectionism experienced poorer mental health (and the reverse)	1 ++				
Resilience	Lack of resilience is associated with poorer mental health	1 +	Resilience is associated with mental wellbeing	1++	Resilience is associated with better coping	1 ++
Hope/optimism	Lack of hope or optimism is associated with poorer mental health	1 ++	Hope or optimism is associated with mental wellbeing	1 ++		
Adaptability/adjustment	Difficulty with adjustment is associated with poorer mental health Good adjustments is negatively associated with poor mental health	1++	Good adjustment is associated with mental wellbeing	1 +++		
Re-appraisal					Re-appraisal is associated with better coping	2++
Self-control			Self-control is associated with greater emotional intelligence	1+		
Suppression						
Emotional Intelligence					Higher levels of emotional intelligence are associated with higher levels of stress	1++
University Factors						
Number of exams					More exams is associated with dysfunctional coping	1+

course						
Academic self-efficacy			Academic self-efficacy is associated with MW	2++		
Year at university						
Participation in learning/engagement/ participation			Participation in learning is associated with MW	1+++		
Lecture experience / induction	Poor lecture experience is associated with poor MH	1 +	Good induction to university is associated with MW	1+		
Attainment						
Finances	Financial stress is associated with poor MH	3 +				
Accommodation	Accommodation is not associated with poor MH	1 +				
Social factors						
Social support Gnan – fewer than 5 friends to count on	Poor social support or problems with friends are associated with poor MH	3 +++	Good social support is associated with MW	2+++	Good social support is associated with better coping	1 +
Isolation /loneliness	A sense of loneliness is associated with poor MH	2 +++				
Lack of Belongingness	A feeling of not belonging is associated with poor MH	2 ++			A sense of belonging is associated with less loneliness	1 +++
Health Behaviours						
Alcohol use	Excessive alcohol use is associated with poor MH	2+				
Smoking	Smoking is not associated with poor MH	1 +				
Drug use	Drug use is associated with poor MH	1 +				
Leisure/physical activity	Participating in leisure and physical activity is negatively associated with poor MH	2 +	Participating in physical activity is associated with good MW	2 +		
Diet	Less healthy food choices are associated with poor MWB	1 +				
Sleep quality	Poor sleep is associated with poor MH	1 +++				

MH factors		
History of poor mental health	A history of poor MH or existing mental illness is associated with poor MH	2 ++
Mental health literacy/ MH attitudes	Higher levels of mental health literacy are associated with increased experience/reporting of poor MH	1 +
Help seeking behaviour	Help seeking is associated with less poor MH	1 ++
Eating disorder	Having and eating disorder is strongly associated with poor MH	1 +++

Qualitative and mixed methods studies

Description of included studies and participants

We identified six qualitative and four mixed methods papers which considered the factors which impact on student wellbeing and the mechanisms which determine whether an individual's experience of university has a positive or negative effect on their wellbeing.

The papers (from the UK) were published between 2013 and 2019. They included data from interviews (n=8) and/or focus groups (n=2) and an analysis of reflective logs (n=1). Studies were cross sectional. All the studies were conducted with populations of UK undergraduate students; two studies also interviewed members of university staff[72, 77]. The students included university undergraduates from single institutions who were studying various, unspecified degrees[69, 71, 77-79], geography or English[72], veterinary science[80], and nursing[81]. Two studies focused on specific year groups, namely first years[82], or second years[83].

In total, over 355 participants were involved in the studies (one study did not report total numbers), with study populations ranging from 10 to 161. It is not possible to report the overall ratio of male to female participants or their ethnicities as several studies did not report this data. Extraction tables for each study are provided (Appendix 1).

Table 15: Summary of study population characteristics

First Author	Study design	Student N=	University N=	Year group	Subjects	%BAME %Female	Mean age
Aceijas (2014)[69]	Focus groups Interviews	NR	1	All	NR	White 45% Black 23% Asian 23% Mixed 9% 70% F	23.6
Cardwell (2017)[80]	Semi structured interviews	18	1	All UG	Veterinary	NR	NR
Devonan (2013)[82]	Qualitative interviews	10	1	1st yr	NR	BAME NR 70% F	19
Holton (2015)[78]	Walking interviews	20	1	All UG	NR	BAME NR 60% F	21 or less
Kannanagara (2018)[71]	Semi structured interviews	10	1	Graduates	NR	BAME NR 70% F	NR (age 21-39)
Macaskill (2018)[83]	Qualitative interviews	23	1	2nd yr	NR	13% BAME 70% F	NR
Pryjmachuk (2019)[81]	Reflective logs	161	1	1st yr	Nursing	NR	NR
Ribchester (2014)[72]	Focus groups	10	1	NR	English / Geography	NR	NR
Taylor (2018)[77]	Semi structured interviews	88	1	NR	Various	BAME NR 50% F	20.88
Vasileiou (2019)[79]	Semi structured interviews	15	1	NR	NR	BAME NR 60% F	20

Themes and mechanisms:

From the extracted data, six interlinked themes emerged which attempted to describe the undergraduate student experience of mental health and wellbeing. In all cases the terms and definitions used by the authors of the individual papers have been retained in this analysis. These themes can be considered to represent the mechanisms in which factors act and interact to define the student experience. In most cases the themes describe the linkages between different factors and therefore represent associations, rather than causal mechanisms. The themes were defined as coping mechanisms (n=5 studies), self-perception (belonging and identity) (n=3 studies), support networks (6 studies), work-life balance (n=2 studies), managing expectations (n=3 studies), and self-control (n=3 studies).

Table 16. outlines how the authors describe the themes. Figure 6 depicts the reported linkages between these factors and demonstrates that all the factors are interdependent rather than acting alone.

1) **Outcome: Coping mechanisms**

In relation to coping with technology and communication, Taylor et al (2018)[77] reported on how constant connectivity affect students' day-to-day life, learning habits and consequent psychosocial wellbeing. Students' wellbeing was negatively affected by their struggles in coping with the ubiquitous availability of resources, in managing: information, communication and expectations regarding support. In coping with the adjustment to university the role of positive psychological strengths such as optimism, hope, self-efficacy and self-control in coping with stress and facilitating positive adaptation are facilitatied[82]. Student experience of their second year of study was also used to explain increased anxiety levels in second year students[83]. Students with high and low anxiety identified the same issues (first-year concerns impacting on the second year, course issues, careers and future employability and student debt). Student participants in the study by Vasileiou et al. (2019)[79] used a variety of coping strategies to manage the experience of loneliness. Accommodation (mainly in the form of distraction), support-seeking, social isolation, self-reliance, and problem-solving behaviours were the most prevalent coping strategies mentioned. Coping reflecting helplessness, escape, submission, and more rarely, opposition, were also found, albeit less often. Kannanagara et al. (2018)[71] discussed the concept of "grit" (coping) as a reliable measure of success and personal and academic achievement. They stressed the importance of happiness, independence, comfort and a stress-free life.

2) Outcome: Self-perception (belonging and identity)

In their study of UK veterinary student's perceptions and experiences of university life, Cardwell et al. (2017)[80] reported that belongingness was central to participant experiences both in student and professional communities. The competitive atmosphere undermined feelings of belongingness and mutual support, and whilst sport allowed bonding, alcohol-based activities presented barriers. This sense of belonging was also strongly linked to the experience of the transition during the first year[82]. These students felt the transition to university represented considerable change in their lives. Independent living, homesickness and the difference between post-compulsory education and university make up the key aspects to the change participants discussed. How non-local students interpret their sense of place within their term time location was also important[78]. Students experience pressures throughout their degree pathway (not just transition) relating to various social and special changes, such as insecurities regarding fitting in among unfamiliar peer groups or a lack of confidence concerning engaging with academic and non-academic practices.

3) Outcome: Support networks

The importance of developing a support network was noted[82], with sub-themes of establishing a support network and support for coping with problems. Not establishing a good support network influenced feelings of isolation and loneliness; and contributed to considering leaving university. Poor mental wellbeing was also predicted by a lack of help-seeking behaviour in cases of distress[69]. Coping with loneliness through support-seeking was a prevalent strategy employed by students[79]. Students were acutely aware of the need to build and maintain friendships in the new environment in order to alleviate loneliness. Contact and comfort seeking were the most commonly reported objectives of support seeking behaviours. Support-seeking was mostly directed to significant others such as family members, friends from home, partners, or friends in the new environment to whom participants felt close[79]. Occasionally health professionals, more distant friends, acquaintances, or peers were also involved.

Pryjmachuk et al. (2019)81 found that successful transition requires joint enterprise between students and university staff, especially in terms of expectations and the support required to become independent learners. Managing expectations was an overarching theme that permeated most of the reflections. This was achieved by 'practical tools and support aids'; the practical, concrete actions that either the university took, or the students developed themselves, to ease the transition. Students' wellbeing was also negatively affected by expectations regarding support[77]. However, pre-induction networking helped alleviate, at least to some degree, anxieties about beginning University including by getting to know people (staff and students)[39].

4) Outcome: Work-life balance

Cardwell et al. (2017)[80] reported on veterinary student acceptance of poor balance between work and relaxation, believing this could be managed later in their career. Macaskill et al. (2018)[83] attempted to explain increased anxiety levels in second year students. The majority related to institutional practices and the unintended impact they may be having on student mental health.

5) Outcome: Managing expectations

Denovan et al. (2013)[82] looked at the anticipatory beliefs which students had regarding university. Respondents experienced disappointment and greater stress from university not meeting their expectations; whereas students who held more accurate expectations adjusted to the transition, because they were more prepared for the experience. Students' wellbeing was negatively affected by their struggles in coping with availability of resources, in managing and their expectations regarding support[77]. Pryjmachuk et al. (2019)[81] found that managing expectations was achieved by 'practical tools and support aids'; the practical, concrete actions that either the university took, or the students developed themselves, to ease the transition.

6) Outcome: Self-control

The efforts of the students to exercise a degree of discipline over their academic studies can be interpreted to represent the positive psychological strength of self-control[82] Self-reliance coping describes a turn to the self and personal resources according to[79]. Emotional regulation was attempted through efforts to logically analyse and understand the reasons for feeling lonely in order to attach a sense-making narrative to the experience. Self-encouragement and self-comforting ideas, such as the thought that the difficult feelings will eventually pass, or that the person is not alone but does have people in their life who are important to them, aimed to regulate emotions. Kannanagara et al. (2018)[71] discussed self-control in successful graduates who had excellent time management, were able to prioritise, and showed high levels of self-awareness and reflection.

Table 16:. Themes and mechanisms

1) Outcome: Coping mechanisms

Context	Mechanism	Outcome	Source
How new technologies and ubiquitous connectivity affect students' day-to-day life, learning habits and consequent psychosocial wellbeing.	Students' wellbeing was negatively affected by their struggles in coping with the ubiquitous availability of resources, in managing: information, communication and expectations regarding support. Students used ubiquitous connectivity to enhance wellbeing by satisfying four basic psychological desires and needs: ease, freedom, engagement and security. Poor coping (managing resources and communication) = poor psychosocial wellbeing.	Coping with technology and communication	Taylor (2018)[77]
How students experience and cope with the adjustment to university: experience of the transition during the first year.	Students used a range of coping strategies. By identifying the role of positive psychological strengths such as optimism, hope, self-efficacy and self-control in coping with stress and facilitating positive adaptation, the study locates positive psychological strengths within a transactional understanding of stress and provides depth and relevance to their role in facilitating adjustment. Acceptance was a functional coping response which enabled students to come to terms with the reality of the situation at hand and accept that their life is changing. Positive psychological strengths = able to manage stress caused by change = improved wellbeing	Coping strategies for transition: optimism, hope, self-efficacy and self-control. Acceptance	Denovan (2013)[82]
Student experience of their second year of study to attempt to explain increased anxiety levels in second year students.	Students with high and low anxiety identified the same issues (first-year concerns impacting on the second year, course issues, careers and future employability and student debt). The groups reported very different coping styles. High anxiety students reported that they tried not to be influenced by first year concerns and continued working hard, but it was difficult. Many students in the low anxiety were much more philosophical and felt able to cope with catching up.	Coping styles in the second year. Anxiety	Macaskill (2018)[83]

	Level of anxiety = effect on coping style = wellbeing		
The coping strategies young adults deploy to manage experiences of loneliness whilst studying at University.	The results demonstrate that participants used a variety of coping strategies to manage the experience of loneliness. Accommodation (mainly in the form of distraction), support-seeking, social isolation, self-reliance, and problem-solving behaviours were the most prevalent coping strategies mentioned. Coping reflecting helplessness, escape, submission, and more rarely, opposition, were also found, albeit less often. Coping strategies = managing loneliness = wellbeing	Coping strategies for managing loneliness: Accommodation (mainly in the form of distraction), support-seeking, social isolation, self-reliance, and problem-solving behaviours	Vasileiou (2019)[79]
Grit as a reliable measure of success and personal and academic achievement	Passion and perseverance; successful students showed a lot of resilience in their time studying at University. Instead of buckling under pressure, or letting stressful life events consume their studies, they overcame these challenges and persisted in the face of adversity. Positive mindsets; successful graduates adopted a positive outlook. They stressed the importance of happiness, independence, comfort and a stress-free life. Wellbeing = “Grit” (perseverence, self control and positive mindset)	Passion and perseverance as methods of coping. Positive mindset	Kannanagara (2018)[71]

2) Outcome: Self-perception (belonging and identity)

Context	Mechanism	Outcome	Source
UK veterinary student’s perceptions and	Belongingness was central to participants experiences both in student and professional communities. Competitive atmosphere undermined feelings of	Belonging	Cardwell (2017)[80]

experiences of university life.	belongingness and mutual support. Sport allowed bonding. Alcohol based activities presented barriers. Strong sense of belonging = positive experience = wellbeing		
How students experience and cope with the adjustment to university: experience of the transition during the first year.	This reflects how the students felt the transition to university represented considerable change in their lives. Independent living, homesickness and the difference between post-compulsory education and university make up the key aspects to the change participants discussed. Some struggled with the new situation and 'all the change' happening to their lives simultaneously. A common response was homesickness. Homesickness = lack of belonging = poor wellbeing.	Change Identify Homesickness	Denovan (2013)[82]
How non-local students interpret their sense of place within their term time location.	Students experience pressures throughout their degree pathway (not just transition) relating to various social and special changes, such as insecurities regarding fitting in among unfamiliar peer groups or a lack of confidence concerting engaging with academic and non-academic practices. The period of being a student differs both across the cohort and throughout the degree pathway and can trigger a myriad of emotional responses which contribute to [un]successful transitions through the rest of the degree pathway. Not "fitting in" = poor wellbeing.	Identity: Fitting in, lack of confidence in academic/social practices	Holton (2015)[78]

3) Outcome: Support networks

Context	Mechanism	Outcome	Source
How students experience and cope with the adjustment to university: experience of the transition during the first year.	The importance of developing a support network includes sub-themes of establishing a support network and support for coping with problems. Not establishing a good support network influenced feelings of isolation and loneliness, contributed to considering leaving university. Social support maps directly onto the transactional model of stress as a constructive method of coping in response to the challenges of the transition. Social support = better transition = wellbeing	Support network Loneliness	Denovan (2013)[82]

First year nursing students' experiences of the transition to university.	Transition requires joint enterprise between students and university staff, especially in terms of expectations and the support required to become independent learners. Managing expectations was an overarching theme that permeated most of the reflections. This was achieved by 'practical tools and support aids'; the practical, concrete actions that either the university took, or the students developed themselves, to ease the transition. A good support network, both social and academic, played a large part in assisting transition. Regarding social support, many students expected to feel alone, unsupported or homesick, fears that were largely unsubstantiated. Support network (social and academic) = better wellbeing in transition.	Practical tools and support aids to aid transition.	Pryjmachuk (2019)[81]
How new technologies and ubiquitous connectivity affect students' day-to-day life, learning habits and consequent psychosocial wellbeing.	Students' wellbeing was negatively affected by their struggles in coping with the ubiquitous availability of resources, in managing: information, communication and expectations regarding support. Realistic expectations of support = improved psychosocial wellbeing.	Coping with technology and connectivity	Taylor (2018)[77]
The coping strategies young adults deploy to manage experiences of loneliness whilst studying at University.	Coping with loneliness through support-seeking was a prevalent strategy. Students were acutely aware of the need to build and maintain friendships in the new environment in order to alleviate loneliness. Contact and comfort seeking were the most commonly reported objectives of support seeking behaviours, whilst seeking instrumental aid appeared less frequently. Support-seeking was mostly directed to significant others such as family members, friends from home, partners, or friends in the new environment to whom participants felt close. Occasionally health professionals, more distant friends, acquaintances, or peers were also involved. Social support = reduced loneliness = wellbeing	Support seeking	Vasileiou (2019)[79]
Bespoke online social networks to support students' transition into higher education during the weeks immediately prior to formal 'on-site' induction.	Pre-induction networking helped alleviate, at least to some degree, anxieties about beginning University including by getting to know people (staff and students). Although some were anxious about taking part, overall, the focus group data highlight the reassurance provided both through active interaction with others in the weeks leading up to the start of university and the more passive reading of information online.	Online social support networks	Ribchester (2014)[72]

	Wellbeing = Increased familiarity = Reduced anxiety		
Students to identify barriers and social determinants of healthier lifestyles	Poor mental wellbeing was associated with an unbalanced diet, not feeling like shopping and cooking frequently, and a lack of help-seeking behaviour in cases of distress.	Help seeking behaviours	Aceijas (2014)[69]

4) Outcome: Work-life balance

Context	Mechanism	Outcome	Source
UK veterinary student's perceptions and experiences of university life	Acceptance of poor balance between work and relaxation – believing this could be managed later in their career. Poor work life balance = negative experience = lower wellbeing	Balance between work and relaxation	Cardwell (2017)[80]
Student experience of their second year of study to attempt to explain increased anxiety levels in second year students.	There were shared anxieties across both groups (low/high anxiety students). The majority related to institutional practices and the unintended impact they may be having on student mental health Perceived pressure (from institution practices) = reduced coping abilities = lower wellbeing.	Institutional practices impacting on coping abilities.	Macaskill (2018)[83]

5) Outcome: Managing expectations

Context	Mechanism	Outcome	Source
How students experience and cope with the adjustment to university: experience of the transition during the first year.	The anticipatory beliefs students had regarding university. Respondents experienced disappointment and greater stress from university not meeting their expectations; whereas students who held more accurate expectations adjusted to the transition, because they were more prepared for the experience.	Managing the expectations of university.	Denovan (2013)[82]

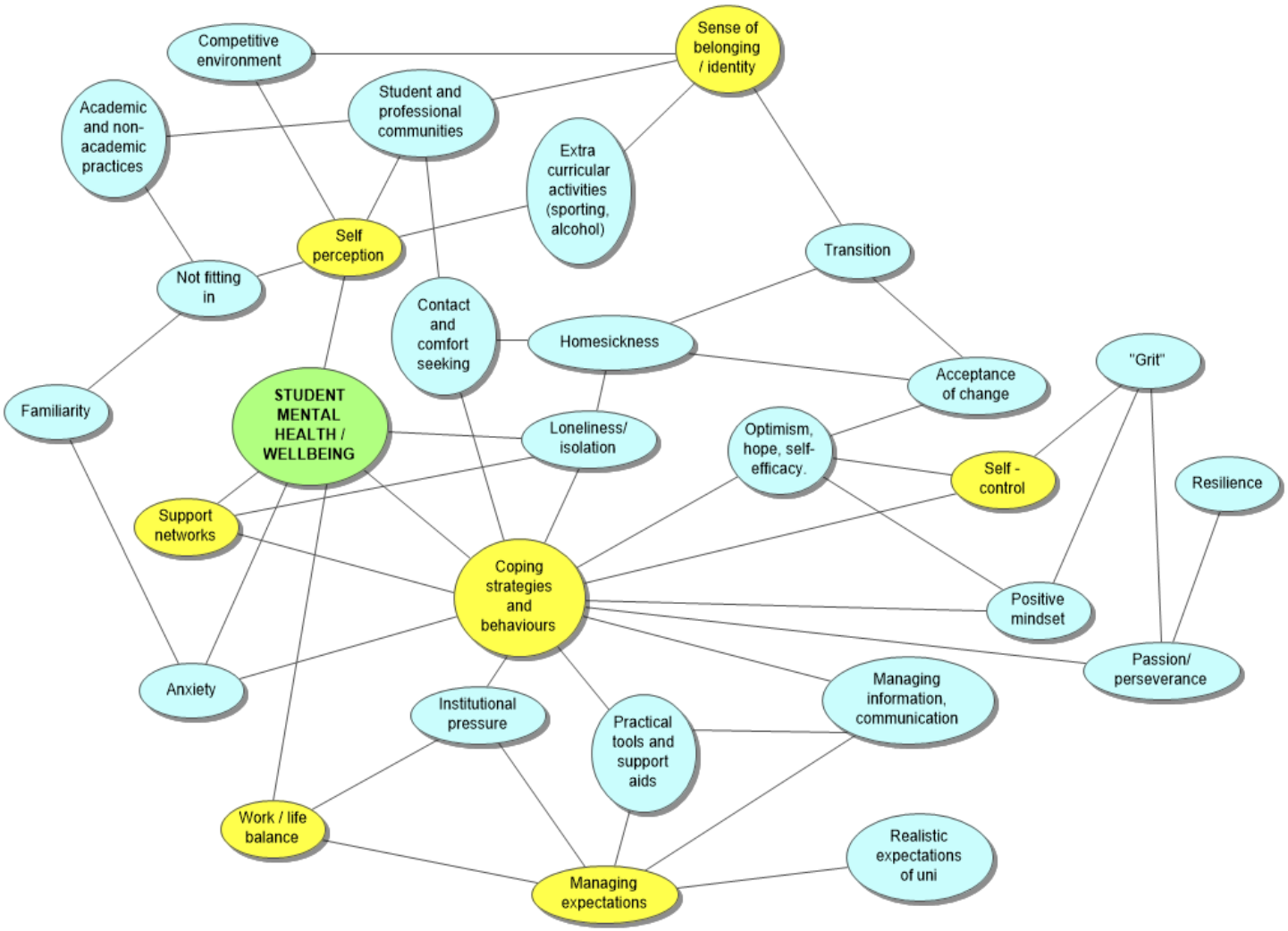
	Unrealistic expectations of university = poor wellbeing.		
How new technologies and ubiquitous connectivity affect students' day-to-day life, learning habits and consequent psychosocial wellbeing.	Students' wellbeing was negatively affected by their struggles in coping with the ubiquitous availability of resources, in managing: information, communication and expectations regarding support. Able to manage expectations = psychosocial wellbeing.	Managing expectations in communication due to new technologies.	Taylor (2018)[77]
First year nursing students' experiences of the transition to university.	Transition requires joint enterprise between students and university staff, especially in terms of expectations and the support required to become independent learners. Managing expectations was achieved by 'practical tools and support aids'; the practical, concrete actions that either the university took, or the students developed themselves, to ease the transition. Managing expectations = better wellbeing in transition.	Managing expectations in the transition to university.	Pryjmachuk (2019)[81]

6) **Outcome: Self-control**

Context	**Mechanism**	**Outcome**	**Source**
How students experience and cope with the adjustment to university: experience of the transition during the first year.	Academic focus (self-discipline, motivation, learning from experience) The efforts of the students to exercise a degree of discipline over their academic studies can be interpreted to represent the positive psychological strength of self-control. Self-control = academic focus = wellbeing	Self-control Academic focus	Denovan (2013)[82]
The coping strategies young adults deploy to manage experiences of loneliness whilst studying at University.	Self-reliance coping describes a turn to the self and personal resources. Emotional regulation was attempted through efforts to logically analyse and understand the reasons for feeling lonely in order to attach a sense-making narrative to the experience. Self-encouragement and self-comforting ideas, such as the thought that the difficult feelings will eventually pass, or that the person is not	Self-reliance	Vasileiou (2019)[79]

	alone but does have people in their life who are important to them, aimed to regulate emotions. Evidence of cognitive restructuring, minimization, and acceptance of the distressing experience of loneliness also appeared in the data. Self-reliance = emotional regulation = wellbeing		
"Grit" as a reliable measure of success and personal and academic achievement	Self-control; successful graduates had excellent time management, were able to prioritise, and showed high levels of self-awareness and reflection. Wellbeing = "Grit" (perseverence, self control and positive mindset)	Self-control	Kannanagara (2018)[71]

Figure 6: Linkages between factors and themes in the qualitative literature



Potential interventions derived from the data in discussion sections of the papers

A total of 28 included papers made recommendations of interventions that could be put in place to assist with student wellbeing. Recommendations varied as to whether they would be delivered before or after arrival on campus and whether they were universal (targeted the whole student population) or focused on specific subgroups of students). The extracted data is provided in Table 17.

Pre-university intervention:

Six studies suggested interventions targeted at students before they go to university. These included four studies supporting the whole student population and focusing on adaptability, engaging with the institution and social networks prior to attending; and parenting practices which may help student's mental wellbeing. One study focused specifically at students with alcohol related problems pre-university, and one made suggestions for suicide prevention in the LGBT student population pre-university.

Holliman et al. (2018)[35] targeted adaptability and/or negative behavioural engagement as part of an intervention to avoid university non-completion and support transition to University. Institutions might provide students with opportunities and dialogue (e.g. at the degree induction) to adjust (cognitively, behaviourally and emotionally) to the higher education environment (i.e. culture, expectations, teaching and assessment, learning) in order to ease the transition and reduce the likelihood of degree withdrawal. Both Lloyd et al. (2014)[63] and McLafferty et al. (2019)[51] suggest that parenting practices and helping parents with developing healthy coping strategies (including strategies to help them to manage their child's additional stressors effectively) is a potential point of intervention in this population. Ribchester et al. (2014)[72] suggest that effective pre-induction social networking is likely to have positive consequences for student retention at first year.

For students with alcohol related problems pre-university, individuals who score highly in public self-consciousness may need to be specifically targeted in interventions - to find alternative coping strategies other than drinking when in social situations[33]. Such targeting would be delivered through interventions delivered before students come to university. Thus, measures that help individuals to feel less embarrassed (such as relaxation techniques) could encourage students who score highly in public self-consciousness to reduce their engagement in pre-loading.

O'Neil (2018)[38] support the need for increased services for people who are LGBT and also the importance of policy change to promote well-being and to prevent suicide in this group. Again, policies and strategies to identify, at an early stage, those with profiles that increase their apparent risk, should be prioritised. It would also be useful to identify vulnerable individuals in secondary schools and as they enter college so that they could be offered additional support during this key time.

University interventions

Mental health interventions - whole population:

Five studies made suggestions for identifying mental health support need within the student population and ways to encourage those individuals to engage with.[32, 56, 58, 70, 84] A further six studies looked at building resilience and coping mechanisms throughout the student population.[34, 52, 53, 57, 59, 61] Two studies made recommendations related to social support[50, 82, 85], and a further three looked specifically at suggestions to manage transition (once students had arrived on campus)[79, 81, 83].

Identifying need and encouraging engagement in support: Jenkins (2020) [84] call for coordinated and effective interventions to reduce mental health problems in students, as well as appropriate screening to identify those in need. Boulton et al (2019) [32] indicate that mechanisms to routinely measure engagement could assist tutors to identify students who are suffering with poor wellbeing and might benefit from intervention or greater support. Gorczynski (2017) [70] state that strategies, such as anonymous online resources, should be designed to help UK university students become more knowledgeable about mental health and comfortable with seeking appropriate support.

In addition, Honney et al (2010) [6] suggest that universities should make it explicit that consultations with tutors regarding mental health issues will not be recorded on a student's file without their agreement - may make students more willing to seek help for such issues.[56] Universities should consider the provision of counselling services involving staff representative of different ethnic minorities, or who have some in-depth understanding of the relevant cultures and religions within their local student body. Oliver et al (2010) [58] report that that informational self-talk was correlated with positive emotional states regardless of situational experience represents initial evidence suggestive that its use should be promoted in higher education. In addition, if encouraging students to use self-talk, it is important that these statements are self-endorsed, emphasize students' autonomy, and increase perceptions of competence. Furthermore, students should be discouraged from using self-talk that is controlling in nature, especially during a negative experience. They suggest that training students in the use of self-

talk may enable more effective coping with stressful events, potentially improving post-lecture affect and ultimately students' experience of higher education.

Building coping skills: Berry & Kingswell (2012)[52] suggest that identifying students who are prone to engaging in maladaptive methods of coping with exam-related stress and helping them develop more functional strategies is an important part of improving the academic potential of students, as well as pastoral care. Students with high levels of anxious attachment would benefit from support in helping them to become aware of their tendency to engage in maladaptive coping and its negative impact. Students who experience particular difficulties in coping with exams might find it helpful to engage with student counselling services and formulate the impact of attachment patterns on current coping styles. Denovan et al. (2017a/b) [34, 59] suggested in two papers, that interventions to develop optimism may significantly improve new students' ability to cope with stress at university and lead to reductions in negative affect. Physical activity was a key factor in these relationships, being associated with greater leisure coping resources and directly predicting well-being outcomes in the model, with resilience having an indirect effect. Promoting leisure engagement among students can help develop psychological resources. Freeth et al (2013) [61] identify that a support programme that assists students in dealing with anxiety inducing situations and teaches strategies to keep anxiety at a manageable level may be particularly valuable. Hassel & Ridout (2018)[53] focus on the active and self-governing role that students need to play in their university education. Students need to monitor their own progress toward completing their degree. Kotera (2019)[57] say that it would be helpful to integrate self-compassion training into higher education business studies curricula – as it can lead to better s-care and mental health. Embedding training in the orientation phase of a study program may be an effective means of building resilience in respect of the psychological stress likely to be encountered.

Social support: Devonan et al (2013)[82] highlight the importance of support network strategies designed to facilitate the creation of social ties for students. Hixenbaugh et al (2012)[50] reported that positive social support can be a predictor of better mental and physical health. Students who reported higher levels of social support also reported a higher level of integration into the University and greater interaction with their peers. They were also more satisfied with their University experience. To support successful student outcomes, institutions should consider strategies that support the development of students' relationships with staff, with other students and with the institution. Thomas et al (2020)[67] suggest that institutions should consider improving the social skills of their students if seeking to reduce the mental health burdens they experience. As such, universities should consider face to face social interactions, facilitated by digital interactions, rather than privileging one over another, or assuming that young people 'live digitally' rather than existing in a hybrid state.

Transition: Pryjmachuk et al, (2019)[81] in terms of easing the transition to university for nursing students, suggest that the focus should be on managing expectations and providing direct support. The sharing of student transition stories (such as the reflections our participants wrote) can help students realise they will not be alone in having anxieties about making friends or having the capability to complete the course. Support activities are often associated with first-term induction. Yet induction activities should be continual and not one-off. In addition, Macaskill et al. (2018)[83] suggest that the first year requiring only a pass mark, or contributing a small percentage to the overall degree classification could reduce anxiety in the first year. Some flexibility with timetabling may be possible. It could help all students to include time management training in the employability related generic skills within the curriculum. Further, Vasileiou et al (2019)[79] suggest that raising awareness of loneliness among students as one of the challenges to be expected during transition to University would help normalize this experience. Greater experience sharing and support seeking among peers could thus be encouraged and further supported by systems such as 'student loneliness ambassadors' or 'buddies'. Such systems could also signpost support services to students at risk and students in need of help to support services. Moreover, directing students to online spaces that encourage the expression and discussion of emotional experiences among peers could be a useful resource when other forms of social support are not available or appropriate. Appropriate training could be provided to academic tutors and supervisors with a view to recognizing signs of loneliness and signposting students to suitable support services.

Addressing problems which impact on mental wellbeing (of sub-groups)

Seven papers looked at healthy lifestyles as a way of improving student wellbeing including encouraging healthy diet and physical activity[42-45, 54, 60, 69], with tailoring of interventions for females and males, and for subgroups of students. Structural changes such as improving financial access to gyms and timetabling to reduce sleep deprivation were also suggested. Three studies looked specifically at manging alcohol misuse on campus[36, 69, 86], two considered interventions for the LGBTQ[38, 47]. A final study made recommendations for autistic students[48].

Healthy lives: In 5 linked papers, EL Ansari et al (2013, 2014 a,b,c 2015) [42-45, 60] suggest that interventions to reduce depressive symptoms and stress among students could also result in the consumption of healthier foods and/or vice versa. Health promoting strategies and activities should address the co-occurrence of depressive symptoms and evidence based interventions should be tailored for females and for males. Further, promotion of students' mental and spiritual health could have a preventive role in hazardous drinking at universities. In addition, Aceijas et al (2014)[69] suggest that changing gym membership to monthly payments without contractual bonds and creating more outside-of-gym, diverse and gender-

based opportunities would increase physical activity. Nutrition could be improved by re-designing in-campus food outlet's offer to include inexpensive, healthy options. Academic demands need to be addressed; long hours of teaching activities with short breaks prompting fast food-seeking behaviours are an intrinsic part of the problem. Finally, Norbury (2019)[54] suggest that over a third of students are chronically sleep deprived, and their sample indicated they would prefer to start university activities later in the day than currently timetabled, the most parsimonious start-time being 11am. The need to Increase awareness of and help seeking for eating disorders was also highlighted.

Alcohol misuse: Aceijas et al (2014)[69] report that alcohol use in the student population needs to be tackled, and that Student Unions have a very important role to play in this respect with their frequent alcohol-based fundraising events. Caswell et al (2016)[86] suggest that targeting impulsivity processes may support reduction of heavy alcohol use. Mahadevan (2008)[36] recommend that in order to combat high alcohol consumption, counselling service can act as a potentially valuable resource for follow-up care in students seen after a self-harming episode. Referral directly to the counselling service on discharge can be particularly beneficial given that many students who self-harm will not seek this help independently.

LGBTQ: Gnan et al (2019)[47] suggest that particular attention should be paid to the most vulnerable LGBTQ student subgroups, including female, bisexual and transgender individuals. The educational context provides a valuable but underused opportunity for prevention and treatment of mental health problems and self-harming behaviours in young LGBTQ people. O'Neil (2018)[38] also support the need for increased services for people who are LGBT and also the importance of policy change to promote well-being and to prevent suicide in this group. Again, policies and strategies to identify, at an early stage, those with profiles that increase their apparent risk, should be prioritised. It would also be useful to identify vulnerable individuals in secondary schools and as they enter college so that they could be offered additional support during this key time.

Autism: Jackson & Dritschel (2015)[48] suggest that programs designed to improve social problem-solving skills could be beneficial in the reduction of depressive vulnerability for young adults on the autism spectrum.

Existing interventions (from umbrella review[87])

The previous "What Works" review reported on 11 different interventions – these all involve stress management/coping interventions which take an individualistic approach to managing

student wellbeing in students with an identified. The interventions identified by the authors were categorised as:

1. Mindfulness – stress reduction, reducing depression etc.
2. “helps us notice signs of stress, depression or anxiety earlier and helps us deal with them better” https://www.nhs.uk/conditions/stress-anxiety-depression/mindfulness/
3. Psychological interventions including cognitive-behavioural interventions – changing thoughts and behaviours to reduce distress.
4. “CBT aims to stop negative cycles such as these by breaking down things that make you feel bad, anxious or scared” https://www.nhs.uk/conditions/cognitive-behavioural-therapy-cbt/how-it-works/
5. Technology-delivered interventions- delivered via a website (internet), university intranet, or mobile phone/tablet technology e.g. online CBT; as above
6. Psychoeducation interventions – stress, coping and relaxation.
   “Psychoeducation may be defined as the education of a person with a psychiatric disorder regarding the symptoms, treatments, and prognosis of that illness”
7. Educational/personalised mail feedback interventions - Educational/personalised mail feedback interventions
8. Recreation programmes - meditation, yoga, Tai Chi (meditative martial arts), exercise, and animal therapy interventions
9. Relaxation interventions – stress management
10. Acceptance and commitment training interventions - change the context rather than the content of an individual’s psychological experience
11. Setting-based interventions - to improve the environment in which a person lives, studies or works
12. Suicide-prevention interventions – including screening and targeted support
13. Tomatis Method - a self-regulation intervention to improve listening.

PPI – interventions not being evaluated/could be developed

The project PPI group made a number of recommendations about the type of interventions they would like to see to support student mental health. They discussed interventions both before and during university life, and also the importance of the transition to university and protecting student mental health in this phase.

Before university: the group felt that interventions should be in place to provide potential students with an accurate understanding of what university is about, and “what you should get out of it”. This might include a discussion of “what is academic success and what it means to

be at university" in order to set realistic expectations of the university experience. Student volunteers could be recruited to be involved in pre university interventions.

At University: the group noted that every University offers different levels of support, and that it would be great if there was a blanket support for all universities (perhaps a government scheme for all universities UK wide). It was considered important to find ways of successfully identifying support needs. This should include identify mental health issues in academically able students who seem fine until they arrive at university. It was noted that it can be challenging to ask people to identify as vulnerable without making some kind of commitment to support those students. This could be encouraged by student endorsement of support services so that new students know others have benefited. This could be achieved through a "really good induction process whereby various pathways to support guidance is available with confidentiality being assured". This could also be reaffirmed as part of an annual process when re-enrolling for each year of study. The importance of university societies, faith organisations and the community outside of university in supporting student mental health was noted.

Transition: the group acknowledge how little known around transition to university in respect to student mental health concerns. They acknowledged the importance but difficulty in establishing an appropriate role for parents in transition. In particular, understanding confidentiality issues and where this causes problems. It was noted that there is a need for practical issues to be addressed too such as managing finances for first time and cooking meals, as these factors could impact on student's anxiety and mental health.

Table 17. Potential interventions identified by authors of included papers

Study	Potential strategies	Uni Pre	Mediator
Berry & Kingswell (2012)[52]	Identifying students who are prone to engaging in maladaptive methods of coping with exam-related stress and helping them develop more functional strategies is therefore an important part of improving the academic potential of students, as well as pastoral care. students with high levels of avoidant attachment might benefit from help in utilising problem-focused coping in relation to exams, which might **include planning revision schedules, setting aside time to revise and encouraging them to seek out practical assistance from others**. As avoidant attachment is associated with an avoidance of relationships and help seeking, these individuals may not proactively approach staff in relation to exams**. Increasing staff awareness of this particular type of attachment style may help them to distinguish between those students who genuinely do not need help and those who do not tend to ask for support.** students with high levels of anxious attachment would benefit from **support in helping them to become aware of their tendency to engage in maladaptive coping and its negative impact. Students who experience particular difficulties in coping with exams might find it helpful to engage with student counselling services and formulate the impact of attachment patterns on current coping styles.**	Uni	Coping Attachment
Boulton et al (2019)[32]	Finding that students who are happy are engaging more is an important result for our understanding of student wellbeing. Coupled with mechanisms to routinely measure engagement, it could assist tutors to identify students who are suffering with poor wellbeing and might benefit from intervention or greater support.	Uni	Engagement
Caswell et al (2016)[86]	Targeting impulsivity processes may support reduction of heavy alcohol use	Uni	Alcohol
Davies et al (2019)[33]	Individuals who score highly in public self-consciousness may need to be specifically targeted in interventions - to find alternative coping strategies other than drinking, when in social situations. Interventions before they come to university.	Pre	Coping Self-consciousness

Study	Potential strategies	Uni Pre	Mediator
	Thus, measures that help individuals to feel less embarrassed (such as relaxation techniques) could encourage students who score highly in public self-consciousness to reduce their engagement in pre-loading		
Denovan (2017a) [34]	Providing support may help to encourage self-belief amongst new students. Interventions to develop optimism may significantly improve new students' ability to cope with stress at university and lead to reductions in negative affect.	Uni	Stress Self-belief
Denovan (2017b)[59]	These results suggest that amongst undergraduates with their generally high stress levels, students who are more resilient may use leisure as a means of developing stress-resistant characteristics, to offer respite from stress, and as a source of social support, which predict higher levels of psychological well-being and this may increase psychological resilience, long term. PA was a key factor in these relationships, being associated with greater leisure coping resources and directly predicting well-being outcomes in the model, with resilience having an indirect effect. Promoting leisure engagement among students can help develop psychological resources and promote PA; a useful strategy even when stress levels are high.	Uni	Coping Stress Resilience
EL Ansari (2014a)[42]	Interventions to reduce depressive symptoms and stress among students could also result in the consumption of healthier foods and/or vice versa.	Uni	Diet Stress
El Ansari (2014b)[43]	Health promoting strategies and activities should address the co-occurrence of depressive symptoms and BIC; evidence based interventions should be tailored for females and for males	Uni	Depression Gender
El Ansari (2014c)[45]	Promotion of students' mental and spiritual health could have a preventive role in hazardous drinking at universities	Uni	Alcohol
El Ansari (2013)[44]	IDU is highly associated with alcohol misuse and smoking calls for action related to preventing risk taking behaviour in general. The study provides also support for initiatives directed towards male students and those with low health awareness, as illicit drug use was highest in these groups.	Uni	Alcohol Gender
Freeth et al (2013)[61]	fear and avoidance of situations and activities necessary for the successful completion of an undergraduate degree. Some of the methods of teaching, such as group seminars and tutorials, and some methods of assessment, such as oral presentations and group projects, used at university may be particularly difficult for individuals who suffer from social anxiety and/or display autistic traits. These individuals may particularly benefit from additional support. A support programme that assists students in dealing with anxiety inducing situations and teaches strategies to keep anxiety at a manageable level may be particularly valuable. An important future direction would be to follow up those individuals who met clinically	Uni	Social anxiety Autism

Study	Potential strategies	Uni Pre	Mediator
	relevant cut-offs for both conditions and to establish whether they were able to successfully complete their degree courses and continue their success in the workplace		
Gorczynski (2017)[70]	Strategies, such as anonymous online resources, should be designed to help UK university students become more knowledgeable about mental health and comfortable with seeking appropriate support.	Uni	Online Support seeking
Gnan et al (2019)[47]	Particular attention should be paid to the most vulnerable LGBTQ student subgroups, including female, bisexual and transgender individuals. The educational context provides a valuable but underused opportunity for prevention and treatment of mental health problems and self-harming behaviours in young LGBTQ people.	Uni	Gender Sexuality
Hassel & Ridout (2018)[53]	For lecturers, reiterating the active and self-governing role that students need to play in their university education. Students need to monitor their own progress toward completing their degree.	Uni	Self-governance
Hixenbaugh et al (2012)[50]	Positive social support can be a predictor of better mental and physical health. Students who reported higher levels of social support also reported a higher level of integration into the University and greater interaction with their peers. They were also more satisfied with their University experience. To support successful student outcomes, institutions should consider strategies that support the development of students' relationships with staff, with other students and with the institution.	Uni	Social support
Holliman (2018)[35]	The findings of the present study provide support for the value of targeting adaptability and/or negative behavioural engagement as part of an intervention to avoid university non-completion. In the context of adjusting to change, novelty and uncertainty at university, adaptability can be promoted. For example, Crosling et al. (2009) emphasise the importance of supporting students' transition to university: it was argued that institutions might provide students with opportunities and dialogue (e.g. at the degree induction) to adjust (cognitively, behaviourally and emotionally) to the higher education environment (i.e. culture, expectations, teaching and assessment, learning) in order to ease the transition and reduce the likelihood of degree withdrawal.	Pre	Engagement Transition
Honney et al (2010)[56]	Make it explicit that consultations with tutors regarding mental health issues will not be recorded on a student's file without their agreement - may make students more willing to seek help for such issues. Consider the provision of counselling services	Uni	Confidentiality Ethnicity

Study	Potential strategies	Uni Pre	Mediator
	involving staff representative of different ethnic minorities, or who have some in-depth understanding of the relevant cultures and religions within their local student body.		
Jackson & Dritschel (2015)[48]	Programs designed to improve social problem-solving skills could be beneficial in the reduction of depressive vulnerability for young-adults on the autism spectrum	Uni?	Autism Depression
Jenkins (2020)[12]	Results call for coordinated and effective interventions to reduce mental health problems in students, as well as appropriate screening to identify those in need	Uni	Screening
Jessop (2020)[62]	NR		
Kotera (2019)[57]	Helpful to integrate self-compassion training into higher education business studies curricula – as it can lead to better slef-care and mental health. Embedding training in the orientation phase of a study program may be an effective means of building resilience in respect of the psychological stress likely to be encountered	Uni	Coping (resilience)
Lloyd (2014)[63]	Implications for social policy in that they suggest complex interrelationships between parental influences and they support current thinking about involving both parents in children's lives.	Pre	Parental support
Mahadevan (2008)[36]	Combat high alcohol consumption. Counselling service as a potentially valuable resource for follow-up care in students seen after DSH episode. Referral directly to the counselling service on discharge can be particularly beneficial given that many students who self-harm will not seek this help independently. Increase awareness of and help seeking for eating disorders	Uni	Alcohol Food
McIntyre (2018)[64]	NR		
McLafferty (2019)[51]	Develop strategies to help them to manage these additional stressors effectively. Parenting practices and helping parents with developing healthy coping strategies	Pre	Coping Parental support
Nightingale (2012)[37]	NR		
Norbury (2019)[54]	First, our data suggest that over a third of students are chronically sleep deprived, obtaining, on average, less than 7 h sleep per night on study days. Second, poor sleep was also associated with increased anxiety. Third, poor quality sleep is more prevalent in the first year of university. Finally, our sample indicated they would prefer to start university activities later in the day than currently timetabled, the most parsimonious start-time being 11am.	Uni	Sleep
Oliver (2010)[58]	From an applied perspective, the finding that informational self-talk was correlated with positive emotional states regardless of situational experience represents initial evidence suggestive that its use should be promoted in higher education. In addition, if encouraging students to use self-talk, it is important that these statements are self-endorsed, emphasize students' autonomy, and increase perceptions of competence.	Uni	Coping

Study	Potential strategies	Uni Pre	Mediator
	Furthermore, students should be discouraged from using self-talk that is controlling in nature, especially during a negative experience. It is proposed that training students in the use of self-talk may enable more effective coping with stressful events, potentially improving post-lecture affect and ultimately students' experience of higher education.		
O'Neil (2018)[38]	The fact that 12.1% of those with ideation had a suicide plan, and 8.2%, a suicide attempt, demonstrates the importance of offering services and treatments to all those with suicidal thoughts. This is also in keeping with the National Institute for Health and Care Excellence (NICE,2011) guidance on risk assessment, recommending that risk scales should not be used to identify who should receive suicide prevention treatments, and that suicide prevention interventions should be offered to all those who report suicidal thought. These findings further support the need for increased services for people who are LGBT and also the importance of policy change to promote well-being and to prevent suicide in this group. ACEs raise risk Mood and anxiety disorders raise risk. Again, policies and strategies to identify, at an early stage, those with profiles that increase their apparent risk, should be prioritised. It would also be useful to identify vulnerable individuals in secondary schools and as they enter college so that they could be offered additional support during this key time.	Pre	Suicide prevention Sexuality
Por et al (2011)[55]	NR		
Richardson (2015)[39]	NR		
Richardson (2017)[40]	NR		
Richardson (2018)[41]	NR		
Taylor (2020)[66]	Programs to build self esteem	Uni	Self esteem
Thomas (2020)[67]	Institutions should consider improving the social skills of their students if seeking to reduce the mental health burdens they experience. This assumption, that universities support the development of social skills, coupled with Potter's (2017) urging for greater engagement with digital literacy, inform our work. As such, universities should consider face to face social interactions, facilitated by digital interactions, rather than privileging one over another, or assuming that young people 'live digitally' rather than existing in a hybrid state.	Uni	Transition Social skills
Aceijas (2014)[69] (MM)	Changing the gym membership to monthly payments without contractual bonds and creating more outside-of-gym, diverse and gender-based opportunities would increase physical activity. Nutrition could be improved by re-	Uni	Healthy lifestyle promotion

Study	Potential strategies	Uni Pre	Mediator
	designing in-campus food outlet's offer to include inexpensive, healthy options. Academic demands need to be addressed; long hours of teaching activities with short breaks prompting fastfood-seeking behaviours are an intrinsic part of the problem. Alcohol use needs to be tackled, and Student Unions have a very important role to play in this respect with their frequent alcohol-based fundraising events		
Cardwell (2017)[80] (Qual)	NR		
Denovan (2013)[82] (Qual)	Given the importance of a support network strategies designed to facilitate the creation of social ties for students are important. Preparation classes at the beginning of university could help, which could address issues such as housemate conflict, autonomous learning and general stress management.	Uni	Transition coping
Holton (2015)[78] (Qual)	NR		
Kannanagara (2018)[71] (MMl)	NR		
Macaskill (2018)[83] (Qual)	First year requiring only a pass mark, or contributing a small percentage to the overall degree classification could reduce anxiety in the first year. Some flexibility with timetabling may be possible. It could help all students to include time management training in the employability related generic skills within the curriculum.		Coping Anxiety
Pryjmachuk (2019)[81] (Qual)	In terms of easing the transition to university for nursing students, our findings suggest that the focus should be on managing expectations and providing direct support. While this is a recommendation that could apply equally to all university students, our findings suggest that, for nursing students, the management of expectations and provision of support should also have a personal dimension and that any support measures should take advantage of student resourcefulness. In the social and personal domains, the sharing of student transition stories (such as the reflections our participants wrote) can help students realise they will not be alone in having anxieties about making friends or having the capability to complete the course. Regarding the provision of formal support across the three domains, nursing departments should avoid the tendency to focus on deficiencies and focus more on students' individual learning needs and how to build upon their strengths. Support activities are often associated with first-term induction. Yet induction activities should be continual and not one-off.	Uni	Transition

Study	Potential strategies	Uni Pre	Mediator
Ribchester (2014)[72] (MM)	Peer friendship and support networks, a sense of belonging, accessibility of tutors and adequacy of information as important factors in supporting a successful transition to higher education, effective pre-induction social networking is likely to have positive consequences for student retention at first year.	Pre	Transition
Taylor (2018)[77] (Qual)	NR		
Vasileiou (2019)[79] (Qual)	Raising awareness of loneliness among students as one of the challenges to be expected during transition to University would help normalize this experience. Greater experience sharing and support seeking among peers could thus be encouraged and further supported by systems such as 'student loneliness ambassadors' or 'buddies'. Such systems could also signpost support services to students at risk and students in need of help to support services. Moreover, directing students to online spaces that encourage the expression and discussion of emotional experiences among peers could be a useful resource when other forms of social support are not available or appropriate. Appropriate training could be provided to academic tutors and supervisors with a view to recognizing signs of loneliness and signposting students to suitable support services.	Uni	Transition Coping

Conclusion

We identified and included 43 primary studies in our review of factors that are associated with poor mental health and positive mental wellbeing in students in higher education in the UK. We only included studies published in the last decade and undertaken within UK institutions. Thirty-two of the included studies were quantitative in design and used cross sectional surveys to measure how the variables of interest affected mental health outcomes.

There was a wide range of factors associated with poor mental health and positive mental wellbeing, which may interact and compound one another in order to create an environment where students are more at risk of poor mental health or where mental wellbeing is strengthened.

The variables were categorised into individual, family, social, university level factors and described following a chronology from pre-university/HE, at transition to university/HE and while at university /HE. The strength of the associations are summarised in Table 14.

At an individual level, factors that were strongly associated with poor mental health outcomes included identifying as LGBTQ and having experienced trauma in childhood. The strongly protective factors of a sense of belonging, strong social networks may in part explain the additional vulnerabilities of these students. Factors that appeared to be protective was older age when starting university. The associations where the results were more mixed and where data was lacking included the impact of gender and ethnicity. A wide range of personal traits and characteristics were also explored. Those associated with resilience, ability to adjust and better coping led to improved mental wellbeing. Better engagement appeared as an important mediator to potentially explain the relationship between these two variables. Engagement led to students being able to then tap into those features that are protective and promoting of mental wellbeing. Other important risk factors for poor mental wellbeing that emerged were those students with existing or previous mental illness. Autistic students and those with poor social problem solving also were more likely to suffer from poor mental health. Negative self-image was also associated with poor mental health at university. Eating disorders were strongly associated with poor mental wellbeing and were found to be far more of a risk in students at university than in a comparative group of young people not in higher education.

At a family level, the experience of childhood trauma and adverse experiences including, for example, neglect, household dysfunction, abuse, were strongly associated with poor mental health in young people at university. Students with a greater number of ‘adverse childhood experiences’ were at significantly greater risk of poor mental health than those students without experience of childhood trauma. Parenting styles showed a less strong association

with poor mental health, but the evidence suggests that young people's early childhood experiences can influence how they adapt and cope at university.

Loneliness and social isolation were strongly associated with poor mental health and a sense of belonging and a strong support network were strongly associated with mental wellbeing and happiness. These associations were strongly positive in the eight studies that explored them. The reinforcing nature of these variables, with social support providing positive reinforcement, and leading to building of further stronger social support networks, while loneliness and isolation could lead to lack of engagement and further isolation creating a negative spiral of poor mental health. The importance of transition to university was highlighted, with some students managing the transition with greater social capital and finding it therefore easier to enter a positive social support – reinforcement cycle.

Exam and course work pressure was associated with perceived stress and poor mental health. a lack of engagement with learning activities was also associated with poor mental health. A number of variables were not consistently shown to be associated with poor mental health including financial concerns and accommodation factors. Very little evidence related to university organisation or support structures were assessed in the evidence. One study found that a good induction programme had benefits for student mental wellbeing and may be a factor that enables students to become a part of a social network positive reinforcement cycle. Involvement in leisure activities was also found to be associated with improved coping strategies and better mental wellbeing. Students with poorer mental health tended to also have eat in a less healthy manner, to consume more harmful levels of alcohol and experience poorer sleep.

Six qualitative studies and four mixed methods studies with qualitative data were included in the review. We identified six interlinked themes which describe the mechanisms that link some of these factors. The themes were identified as coping mechanism, self-perception (belonging and identity), support networks, work-life balance, managing expectations, and self-control.

Our analysis led to the development of an explanatory conceptual model. At its core is student mental health and wellbeing, surrounded by concentric circles depicting the individual, family, social, and university and policy level factors that impact the core. Factors were described as those that create vulnerability, buffers that are protective, factors that act as triggers and factors that act as 'red flags' or indicators of deteriorating mental wellbeing. It is evident that those vulnerabilities that lead to a sense of isolation and not belonging, when compounded by social isolation, and stress, the failure to develop positive coping strategies and a withdrawal from learning activities creates an environment that makes a student at high risk of poor mental health. It helps to explain why the restrictions imposed on university students to contain COVID

19, the absence of opportunities to build social support networks and for lack of engagement to be readily unseen, has resulted in such adverse impacts on mental wellbeing[24].

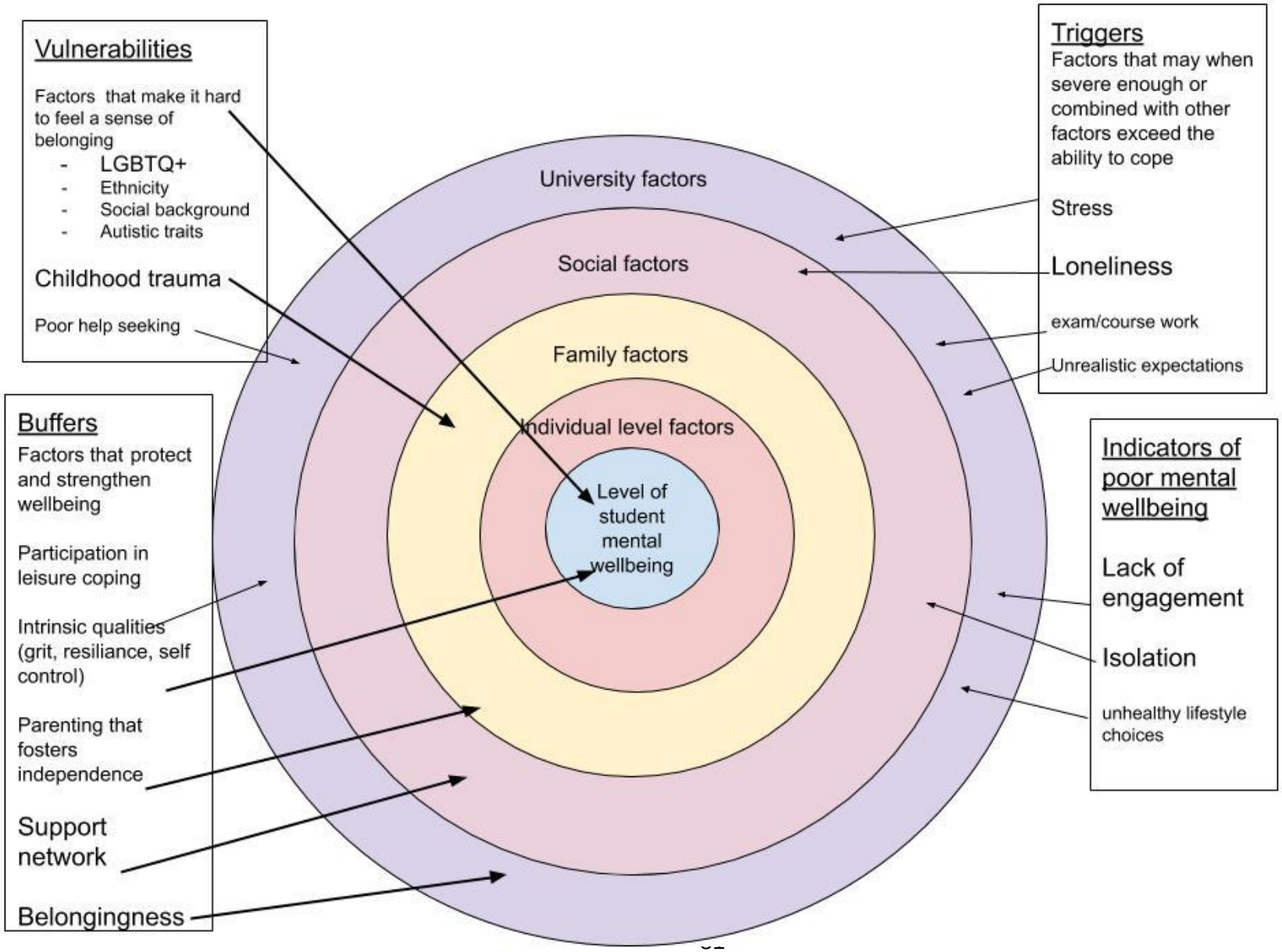
Another objective of this review has been to identify gaps in current knowledge and areas for future innovations. We used our PPI consultations and an analysis of recommendations for practice within the primary studies to identify these gaps.

A number of groups and also variables were identified where current knowledge is lacking. There was a lack of data that described the experience of BAME students, and students with disabilities and young carers. Also, while it was clear from the data that a student's background and childhood experiences could influence their vulnerability to poor mental health, the impact of widening access policies and how these impact young people where there is little family history of attending higher education is poorly understood. The PPI group also identified the challenge of high expectations and from themselves and others of what university would be and how to manage these when it failed to be as expected. The factors raised by the PPI group are highlighted in figure 8.

The factors that increased the risk of students experiencing poor mental health at university begin before a young person enters university. There are also factors at university that increase vulnerability to poor mental health and also factors that can strengthen mental wellbeing, such as strategies to improve a sense of belonging and creating opportunities and an environment that recognises the importance of developing social networks. These are areas where interventions could be developed to reduce risk to poor mental wellbeing. Existing interventions identified in the systematic review by Worsley et al (2019)[31] demonstrate that there are currently areas where there is scope to develop and innovate interventions. Areas for potential interventions were also identified by the PPI group and included establishing an appropriate role for parents for young people in transition, improved induction process, acceptable ways to identify students who may be at risk of poor mental health and ways to best offer support, making support services accessible and easily available, and improved transition programmes.

A limitation of the evidence available is that many relevant groups are not visible within the research including students in higher education but non-university settings, students from BAME backgrounds and international students.

Figure 7 – Conceptual model



Text size indicates the strength of the

Vignettes from the Student Mental Health Public Advisory Group

Susan - parent

'Before going to University, Jacob didn't experience any mental health issue and was naively ignorant about fellow students who have suffered from mental health struggles for many years before. Going to day school, living in a busy city with family meant that Jacob had never felt any mental health issues before going to University. He was very comfortable and happy with his childhood and never really had to worry about many aspects of his life before leaving home to go to university. After completing A Levels, anxiety sunk in for the first time during the summer over the expectations of getting good A Level results and going to a University that he felt proud of, and also a University that his family would be proud of. This anxiety stemmed from letting down himself and family members. Once results day came, a second type of anxiety hit of being separated from home, friends, family and everything that has been normal for the previous 18 years of his life. The prospect of going many months without being at home and surrounded by family is a daunting one, that can be a trigger to mental health problems for many years. His friends were all going to different universities around the country and He did not know anyone well who was going to his university whereas a lot of his friends were going to universities where they already had very close friends going to. There was a lot of anxiety leading up to the day of leaving to going to university and the fear of not enjoying it as much as peers or even parents. It is difficult to explain to parents that in a social media world, everyone knows what everyone is doing at all times so if you aren't having as much fun as your peers, this can be challenging when trying to settle into a new place.

Before going to university, parents still talk about how university days were some of the best days of our lives and so there was a lot of pressure and expectation for his university experience to be the same. Especially as everyone talks about how much fun freshers is and going out and drinking a lot. No one talks about the anxiety of hangovers and being away from family and having to make sure you wake up on time in the morning and make yourself something to eat. There is a real independence that is suddenly expected from students which can be very difficult for students to grasp and can ultimately result in mental health struggles.

Triggers to mental health issues at university definitely include the pressure and expectations from friends and family before going to university. As well as the pressure to drink/experiment with drugs while at university that might be new for some university students that can lead to anxiety, especially as some students feel as though they cannot talk to their family about these struggles, and there is a lack of people that they can speak to about it with fellow people at university (don't want to talk to a doctor about it). Being away from home and having to look after yourself for the first time. Making sure you eat enough and healthily enough, cleaning your clothes and room. All the simple things that are taken for guaranteed for so many years. The fear of missing out on making friends if you do not attend everything, as well as missing your home friends and comparing their university experience to your own. These pressures are common triggers for students who are starting their time at University.'

'The key issues I experience was lack of support from university once I was signed up and all the funding for payment for them was all in place. Before there was so much support from them it was unbelievable. Then once they received confirmation from student finance it stops. I tried contacting them several times, no response. This was starting to stress me out as I found I was all alone. I had been out of Education for years. I was given funding to have extra support. The agency contacted me and inform me I would have to work around the tutor who was going to be supporting me as they

are the number of people to work with. I gave them my availability. They told me it was going to work. I would have to work around them or receive no support at all. They also informed me they had already received payment for the next year. This really upset me. As I have a number of disabilities. I should have been able to choose my own support worker. As if this person was going to be working with me, it was really important we got on. After this they failed to communicate with me, and I complained and the relationship between a was very uncomfortable for me. So, shut myself off away from everyone. This causes a breakdown.'

Alex – student

'My depression and anxiety resulted from an abusive relationship that took me many years to leave. In 2013 I fled domestic violence and was in a refuge for six months before relocating and starting life with a new name in a new town.

Prior to university I had been unable to work full-time, depression and anxiety left me very fatigued and unable to manage a full-work load in the education sector, in 2017 I was made redundant and made the decision to do something for me, not for my career or for anyone else, for me. Starting university was a huge step and I was fortunate to have a choice of two universities within an hour of home (I wouldn't have explored any courses if I had had to move away as I was extremely vulnerable and didn't feel safe outside my new town). Starting my current course in Fine Art was also one that came about from following my intuition, my previous choice had been to do a different course at a different university that was work/career related but after completing some work experience this felt wrong and a well-timed art retreat in Wales that summer resulted in me changing direction quickly, to do something that might be fun, rather than practical or useful (or so it seemed at the time).

I had low self-esteem and confidence, with no formal art training from school, I was not used to the language or terminology being used in classes and I found it difficult to adjust to being the only mature student among a foundation year full of 17/18yr olds as I had previously been teaching this age group. Due to the age difference I think they also felt that I was somehow the one that needed to take charge in group discussions etc even though I had no idea as I had not had no previous experience like they had from school. I found myself facilitating discussion as I would have done as a teacher and was anxious when there was silence in a room and the lecturer asked for feedback or discussion, I found it stressful desperately wanting to try to fill this silence because I knew how he would be feeling, this raised my anxiety in particular classes in the first few months as I adjusted to being student not teacher!

The university were amazing (and still are!), I was assessed for support quickly and as difficulties arose in class and during the term, I had mentor support with a specialist mental health mentor to guide me along what felt like an uphill battle at times, I could email and see her face to face so it was useful when I just needed to park something to discuss at my next mentor session or to clarify something that was bothering me. There have been many occasions in the last three years that I have considered intermission or just dropping out altogether just because it felt like the easier option despite wanting to stay on the course. The adjustments made to my attendance when my depression was especially low, or anxiety prevented me from staying in a class for very long have been really appreciated and the tutors and support staff amazingly understanding. I have been supported to stay on the course, with practical solutions and support being put in place, including

extensions to deadlines when needed. The level of support I receive is consistent and when my health changed in the last couple of years, further measures were put in place to support me.

Having the mentor support has been especially useful for my subject area. Having fled domestic violence, my confidence, self-esteem was very low, even more so following a redundancy in a role I had enjoyed. I hadn't been prepared for how the Fine Art course would not only challenge my skill set and stretch what I had taught myself but would also teach me as much about myself as a person, the negative self-beliefs that were tripping me up when a deadline is due, when work was/is requested for exhibition all a result of my abuse. I have gained soft skills around 'being seen' and 'being happy being seen', 'having a voice' and 'being able to complete an activity regardless of the outcome' i.e. with art there is no definitive answer, no definitive right or wrong which I really struggled with in the beginning and still do at times now. That said I now have more skills to help me explore what is going on in my mind, I have tools that both my mental health support mentor and my therapist have given me over this time at university and I feel I am going to leave next summer in a much stronger mental state than when I started. Studying a subject that has no definitive view has been good for my personal growth but that said it hasn't been easy and has taken a lot of personal effort and support from the university to now be entering my final year.'

Jasmine – student

'I arrived at university in a completely brand-new city and I felt a rush of anxiety cover me. I felt afraid and alone and I knew that there would be new challenges. Initially I struggled as I was alone, and I fell into a long depression because I was lonely and soon my work started to slip. I am still dealing with ongoing mental health issues while at university, but it feels lighter and it's more manageable with access to therapy/ counselling on site.'

'Entering into the realm of Level 4 and beyond higher education can be exceedingly daunting for one and all and there more importantly being a recognition that every university student will face differing hurdles. Yet if you are from the less privileged circle of U.K. society and from a minority group with a recognised learning disability there is what I personally feel to be this existence of a systematic discriminatory oppressive elitist hegemony which regrettably is visible in most higher education settings.

This is how I personally felt when I commenced my PG-Dip course at university of xxxxxx and where on the induction day this lingering thought of dread and "what I have got myself into" constantly entered into my mind.

This arose as a result of being one of three exclusive BAME persons in the course group of 30 and where from low rank lecturer to senior lecturer to module leader and other essential course admin staff all the way to the Dean, the hegemony of a insular identity was very apparent.

This was most surprising to myself being that the university sold itself in its yearly prospectus magazines as a university of 'diversity' and yet it somehow managed to preserve a solid 1940s style identity in the context of staffing and student recruitment, which served the concept of 'multicultural' Britain a huge blow.

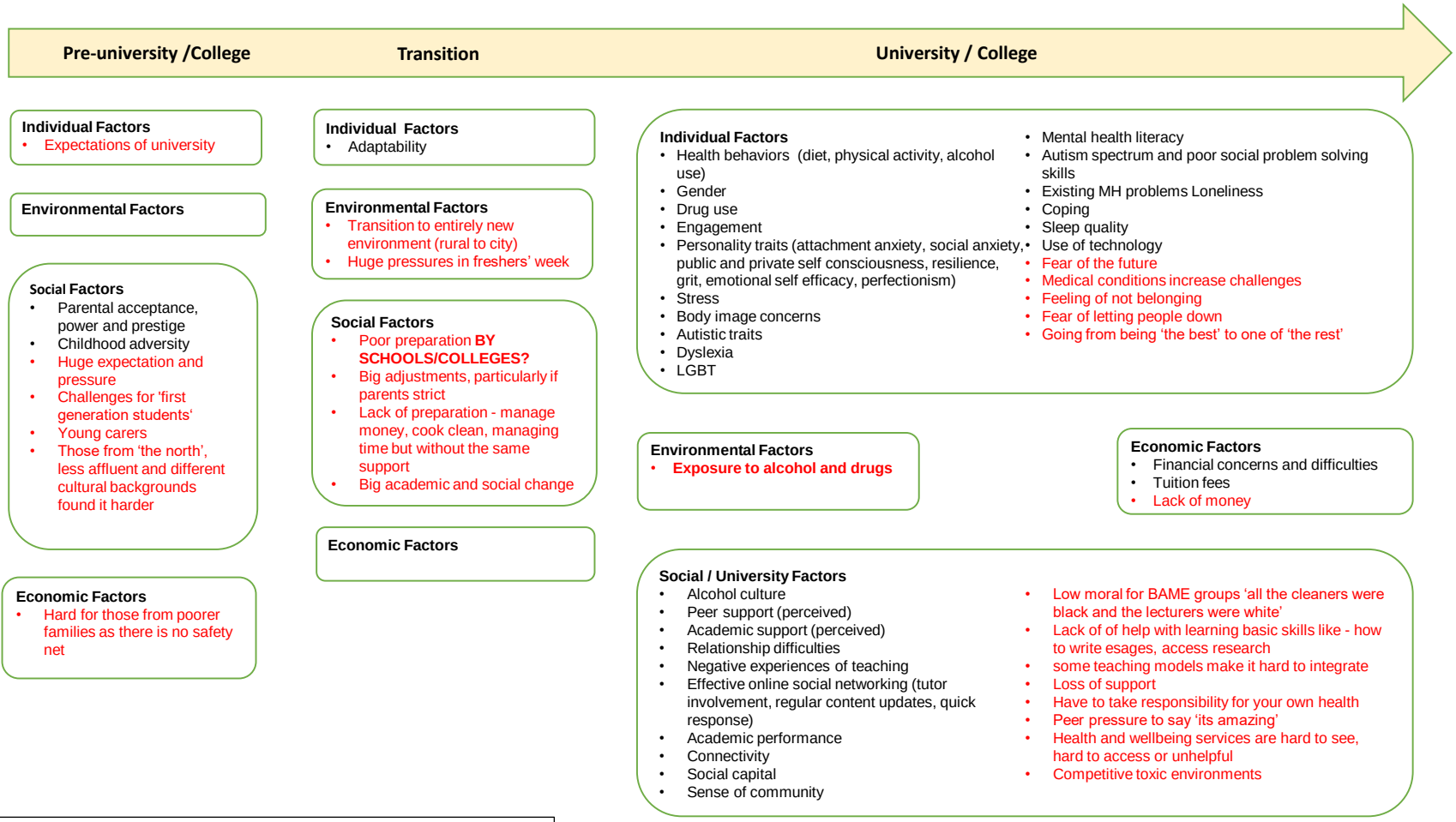
As the days went by I was not at all comfortable to being a actual minority and my confidence level somewhat ebbed away. While I was comfortable in completing all set academic work there remained indeed this inferiority complex.

This was exacerbated further by myself not being able to attain acquaintances with the majority of the English students whom seemed to have not met a foreign looking person before and whom appeared comfortable establishing this sense of camaraderie amongst themselves.

Furthermore, I felt that the lecturers were not helping my mental health situation by this apparent desire to be more friendly and jovial with their fellow identitarians whereas in contrast there was a more formal approach, or so it seemed, with myself.

Thus, I did feel like a complete outsider during the whole period of course and I could not even express myself to the Student Well-being Department, as they too seemed less caring and very inept in dealing with student mental health matters; although in fairness to them they did refer me for a few therapeutic support.'

Figure 8: Initial conceptual model



PPI contributions: - RED text

Variables identified in literature: BLACK text

Appendix 1. Search strategy

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Daily and Versions(R) <1946 to June 09, 2020>

Search Strategy:

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1 *Students/ (33349)

2 *Universities/ (15488)

3 1 and 2 (3843)

4 (student$ adj3 (universit$ or "further education" or "higher education" or fe)).ti,ab. (20857)

5 3 or 4 (23461)

6 transition$.ti,ab. (406371)

7 Social Adjustment/ (23224)

8 adjustment$.ti,ab. (192533)

9 Mental Health/ (37794)

10 Mental Disorders/ (161715)

11 (wellbeing or well being).ti,ab. (89221)

12 mental health.ti,ab. (140619)

13 Depression/ (117867)

14 depress$.ab,ti. (454658)

15 Anxiety/ (80200)

16 exp Anxiety Disorders/ (78962)

17 anxiet$.ab,ti. (188858)

18 Suicide/ (39031)

19 suicid$.ab,ti. (76742)

20 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 (1544126)

21 5 and 20 (4699)

22 correlat$.ab,ti. (1859022)

23 causal factor$.ab,ti. (5495)

24 risk factors/ (818974)

25 factor$.ab,ti. (3332190)

26 Association/ (4009)

27 associat$.ab,ti. (4433600)

28 risk.ab,ti. (2078199)

29 exp Cohort Studies/ (1998151)

30 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 (9554385)

31 21 and 30 (3225)

32 limit 31 to (english language and humans and yr="2010 -Current") (1600)

33 from 32 keep 1-1600 (1600)

****

Appendix 2. Websites searched for grey literature

Mental Health Foundation - www.mentalhealth.org.uk/

Mind - www.mind.org.uk

Student Minds - www.studentminds.org.uk/

Young Minds – www.youngminds.org.uk/

Search for students and mental health on search engine Google (www.google.co.uk/)

Appendix 3. Search strategy theories and models

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily <1946 to September 21, 2020>

Search Strategy:

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1 "coping reserv* ".af. (4)

2 Dual axis model of mental health.af. (0)

3 dual-axis model of coping.af. (1)

4 model of student psychosocial well-being.af. (0)

5 model psychological wellbeing.af. (0)

6 resilience theory.af. (111)

7 minority stress framework.af. (23)

8 interpersonal psychological theory of suicide.af. (142)

9 college students/ (0)

10 (student$ adj3 (universit$ or "further education" or "higher education" or fe)).ti,ab. (21633)

11 9 or 10 (21633)

12 transition$.ab,ti. (415373)

13 adjustment$.ab,ti. (196538)

14 mental health/ (39108)

15 mental health.ab,ti. (145904)

16 mental disorders/ (163199)

17 (wellbeing or well being).ab,ti. (92699)

18 well being/ (0)

19 "Depression (Emotion)"/ or Major Depression/ (120248)

20 depress$.ab,ti. (463165)

21 anxiety/ (81860)

22 anxiety disorders/ (33897)

23 Suicide/ (39405)

24 suicid$.ab,ti. (78327)

25 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 (1486086)

26 11 and 25 (3986)

27 Models, Theoretical/ (151697)

28 (framework* or theor* or model* or models or concept*).ab,ti. (3890387)

29 27 or 28 (3936142)

30 26 and 29 (1056)

31 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 (281)

32 30 or 31 (1333)

33 limit 32 to (english language and humans) (952)

34 limit 33 to yr="2010 -Current" (747)

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Appendix 4 Data extraction tables – Qualitative Studies

Author year Country	Population	Study design Analysis	Research question	Outcomes	Main findings	Key quotations / Models	Linkages
Aceijas 2014[69] UK	70% of respondents were women, half of the sample was 18–21 years old (mean = 23.6; standard deviation (SD) = 7). Close to half of respondents were White (45%) followed by Black (23%), Asian (23%) and mixed ethnicity respondents (9%).	MIXED METHODS Two focus groups and three in-depth interviews. Large qualitative survey also undertaken. A thematic approach guided the analysis of qualitative data	Investigate students' health-related lifestyles and to identify barriers and social determinants of healthier lifestyles	Student wellbeing. Plus other factors relating to healthier lifestyles	Poor mental wellbeing was predicted by unbalanced diet, not feeling like shopping and cooking, frequently, and a lack of help-seeking behaviour in cases of distress. (1) Transition to New Life: students learning to take responsibility for their health in balance with studying, social life, and often outside work which negatively affected their lifestyle choices; (2) University Environment: students felt their health was negatively impacted by the culture in the University living residences. The wellbeing service on site was perceived as hard to access; (3) University Systems: changes made to consolidate the time students often entail long days and short breaks for students; (4) Finances: economic hardship makes healthy living a challenge; (5) Academic Pressure: smoking and alcohol use were perceived as stress-relieving strategies which increased students' vulnerability to poorer health; (6) Health Promotion on Campus: health promoting events were offered; however, they can be poorly timed resulting in a lack of awareness and reduced student engagement; and (7) Recommendations: suggested	I've noticed a big increase in students who genuinely can't cope and why that is I don't know [...] a lot of anxiety, a lot of depression'	Wellbeing → Help seeking behaviours

					Targeted health events and awareness campaigns and centralising health services to increase accessibility. Interviews with staff showed acute awareness of student distress during examination periods. They also noted a rise in mental distress more generally.		
Cardwell 2017[80] UK	18 students from single UK university. Veterinary students	QUALITATIVE Semi structured interviews	Sought to explore UK veterinary student's perceptions and experiences of university life, and to consider how this may affect wellbeing.	Wellbeing	Three key themes: deep rooted vocation, belongingness, finding balance. Considerable influence on wellbeing. Belongingness was central to participants experiences both in student and professional communities. Acceptance of poor balance between work and relaxation – believing this could be managed later in their career. Sport allowed bonding. Alcohol based activities presented barriers. Pressure to find friends in freshers week. Competitive atmosphere undermined feelings of belongingness and mutual support	"The trouble with Fresher's week is it's arranged by the party animals in the year above….. I don't dislike clubbing but it's not the best way to get to know people". "It's really odd because everyone who comes here is a high achiever…… and you aren't therefore good enough". "As we have started these rotations you can visibly see people changing and becoming more positive and better able to deal with things". Turning to college student support is not something I have every considered really…….. if I have personal problems I try to sort them out myself".	Wellbeing → Vocation, Belongingness, Balance Undermined by competitive environment
Denovan 2013[82] UK	10 first year UK undergraduates.	QUALITATIVE Qualitative interviews with a content specific	How do students experience and cope	Stress Transition	Five main themes were identified: 1. All the change (independent living, homesickness, differences between	"Having to sort myself out and being more independent and with all the change I found it quite hard	Positive psychological strengths →

	Purposive sampling: demographics similar to national statistics on UK undergraduates. 3 males and 7 females. Mean age of 19 years (SD = 1, range 18–21). 7 (70%) lived away from home. 5 (50%) had a job whilst at university.	vignette to develop rapport. Interpretative phenomenological analysis	with the adjustment to university: experience of the transition during the first year.		post-compulsory education and university). This theme concerns how the students felt the transition to university represented considerable change in their lives. Independent living, homesickness and the difference between post-compulsory education and university make up the key aspects to the change participants discussed. Some struggled with the new situation and 'all the change' happening to their lives simultaneously. A common response was homesickness. Acceptance was a functional coping response which enabled students to come to terms with the reality of the situation at hand and accept that their life is changing 2. Expectations of university This theme represents the anticipatory beliefs students had regarding university. Respondents experienced disappointment and greater stress from university not meeting their expectations; whereas students who held more accurate expectations adjusted to the transition, because they were more prepared for the experience. 3. Academic focus (self-discipline, motivation, learning from experience) The efforts of the students to exercise a degree of discipline over their academic studies can be interpreted to represent the positive psychological strength of self-control.	to like begin with and it's really quite scary in the first few weeks just thinking 'oh God I'm here by myself, what am I doing now?' It was like a lot of things were changing and happening all at once". "I came expecting like that you'd come here and make sort of loads and loads and loads of friends and it would be great but it didn't really happen like that for me. I feel upset it didn't work out better". "You don't come to uni for just the social side, you've got to do work as well, so I think it [giving in to distractions] just made me realise that I'm actually wasting my opportunities, and it's not me not to do my best". "On my last course everyone wanted to get to uni and that and everyone kept each other motivated and it was like a team sort of thing, whereas this one it doesn't feel quite as much. I'd say if you don't have a good support group you struggle more I'd say".	able to manage stress caused by change

					4. Support network (establishing a support network, support for coping with problems). Not establishing a good support network influenced feelings of isolation and loneliness, and contributed to considering leaving university. 5. Difficulties (difficulties experienced with housemates, finances and employment, and academic difficulties). Students used a range of coping strategies. By identifying the role of positive psychological strengths such as optimism, hope, self-efficacy and self-control in coping with stress and facilitating positive adaptation, the study locates positive psychological strengths within a transactional understanding of stress and provides depth and relevance to their role in facilitating adjustment.	"I live with people in different years they weren't erm wouldn't tend to socialise, like everyone lives their own life and then just like makes mess and make noise and it's just like an uneasy place to live…like everyone does like their own thing in my flat and it's like a bad environment, and there's a lot of damage being caused like carpets being burned, windows have been broken and stuff".	
Holton 2015[78] UK	One UK university 20 students 12 female, 8 male. 11 1st yr, 9 2nd yr, 11 3rd yr. White (n=18), British (n=17) Aged under 21 (n=16)	QUALITATIVE Walking interviews	How do non local students go about interpreting their sense of place within their term time location?	Sense of place (not just in transition)	Students experience pressures throughout their degree pathway (not just transition) relating to various social and special changes, such as insecurities regarding fitting in among unfamiliar peer groups or a lack of confidence concerting engaging with academic and non-academic practices, and draws attention to the non-linearity of students' associations with their term time location. There is a spatial element to discussions of undergraduate transitions by questioning the influence place attachment may have upon the	"When I first came to Portsmouth my thinking was that I leaving my great big city….. I thought it would be fun but this place was a bit too quiet for me. And everything….closed at 4 on a Sunday which was even worse". "It reminds me of home, I come here because back at home I live by the sea".. "I was in a year one bubble……. When you go	Sense of place → Successful transitions throughout the degree. Unsuccessful transitions → Insecurities about fitting in, lack of confidence in academic and

					formation of undergraduates' identities and their experiences of 'being', or 'becoming' students. The period of being a student differs both across the cohort and throughout the degree pathway and can trigger a myriad of emotional responses which contribute to [un]successful transitions through the rest of the degree pathway.	from your halls to your Uni and back to your halls, to the pub and then back to your halls again". "The people who live here are some of the nicest people and they don't judge students, you know".	non-academic practices.
Kannanagara 2018[71] UK	10 "successful" Graduates (University of Bolton): 1st class degree, high score on grit scale. Female: 70% 245 female participants and 170 males. 161 participants were between 18 and 21; 112 participants were between 22 and 26; 40 participants between the age of 27 and 30; 124 participants were 31 and above. undergraduate students (357) postgraduate student 39	MIXED METHODS Semi-structured interviews were coded using thematic analysis. (Questionnaires also conducted)	Determine whether grit is a reliable measure of success and personal and academic achievement and how it relates to success.	Grit: "*perseverance and passion for long-term goals"*	Three main themes: (a) passion and perseverance; successful students showed a lot of resilience in their time studying at University. Instead of buckling under pressure, or letting stressful life events consume their studies, they overcame these challenges and persisted in the face of adversity. (b) self-control; successful graduates had excellent time management, were able to prioritise, and showed high levels of self-awareness and reflection. (c) positive mindsets; successful graduates adopted a positive outlook. They stressed the importance of happiness, independence, comfort and a stress-free life. The importance of receiving feedback on assignments and the crucial element of constructive criticism was stressed by the majority of students. Successful students noticed the responsibility they held over their own success.	"*Having two children and I worked: : :because obviously we have to pay for a mortgage: : :. I lost two people while I was studying, who were very close so that was hard. Erm, but I also found that doing University stuff actually took my mind off it as well, in a way.*" "*I always set deadlines, personal deadlines: : :always be ready at least 4 days before the actual deadline so I was left time of 3 or 4 days to double check, to proof read*" "*There is a financial element to success, but it's not that important to me, quality of life is important;*"	Wellbeing → "Grit" (perseverence, self control and positive mindset)

Macaskill 2018[83] UK	N=23 second year undergraduates. One post-92 university. 16 female, 7 male, mean age 20.81 years, 20 white British, 2 British Asian, 1 Afro-Caribbean. Students were grouped according to their psychiatric scores, giving two groups; a well group with scores <5 and a clinical case group with scores >6. One post-92 university.	QUALITATIVE Interviews: Narrative interviewing method – face to face interview. General Health Questionnaire-	To examine in some depth the student experience of their second year of study using qualitative methods to see whether this can help explain the increased anxiety levels in second year students.	Experience of the second year of study. Increases in psychiatric symptoms (anxiety).	Both groups identified the same issues (namely, the first-year concerns impacting on the second year, course issues, careers and future employability and student debt). the groups reported very different coping styles. In relation to the theme, "first-year concerns ", four students from the CG reported that they tried not to be influenced by the message and continued working hard in Semester 2 but it was difficult. Many students in the WG were much more philosophical and felt able to cope with catching up. There were shared anxieties across both groups. The majority related to institutional practices and the unintended impact they may be having on student mental health.	"First year was really exciting, living independently, having lots of freedom and things but now I am used to it and take it for granted, it is just life now". "We did two group projects...and no one in my group was very bothered about them. I thought they were poor and wanted to rewrite them both but I worried what the others would say about me. I did nothing but I felt bad". "I have met loads of new people this year in seminars. It has made a nice change. I still have a few good friends from first year too." "My father tells me not to worry about it. It's for the future so I try not to think about it. I'm careful what I spend and I work in the holidays and it all helps.'	Managing anxiety → Coping style Institution practices → Anxiety
Pryjmachuk 2019[81] UK	N=161 nursing students one university. 50 reflective logs used. 22 moved away, 16 living at	QUALITATIVE Analysis of a reflective log: 500 word, formative reflection on the transition to university.	To explore first year nursing students' experiences of the transition to university; to	Transition	Two main themes: (i) 'managing expectations', was an overarching theme in many of the reflections; (ii) 'practical tools and support aids', the practical, concrete actions that either the university took, or the	Managing Expectations: "It has definitely been one of the most overwhelming periods of my life. Adjusting to the university environment and the new learning techniques".	Preparedness (resilience?) → expectations and support mechanisms

	home (rest unknown). (= 30 'traditional' students, had come straight to university from school or college. Eighteen mature students Gender and ethnicity not reported	Thematic content analysis of anonymised logs.	compare nursing students' experiences with those of other disciplines and identify ways of easing the transition for nursing students.		students developed themselves, to ease the transition. Both themes embraced inter-related academic, social and personal domains. A good support network, both social and academic, played a large part in assisting transition. Regarding social support, many students expected to feel alone, unsupported or homesick, fears that were largely unsubstantiated. Students really valued 'transition enhancing strategies' such as seminar groups, enquiry-based learning (EBL) sessions, peer-assisted student support (PASS) sessions and the practical skills elements of the degree. They also valued extra online resources, and podcast lectures and virtual learning guides (e.g. on referencing). Formative assessments were considered useful for testing knowledge and practising writing skills. Transition requires joint enterprise between students and university staff, especially in terms of expectations and the support required to become independent learners.	'[making friends] worried me a lot to begin with but knowing that I wasn't the only individual in this position enabled me to overcome this worry.' Practical support: '…I had to trial a few methods of note taking before I found what suited me best.' '…another challenge for me was trying to find a note taking technique that would suit me…Everyone has their own preferred way of learning, and thanks to the University I have found mine too.' 'Even though it has been a challenge…missing home and friends, the best thing to do is remember that you are studying for a degree you are passionate about'.	
Ribchester 2014[72] UK	Two contrasting departments (focus groups of English n=3 students and Geography n = 7 students).	MIXED METHODS Student focus groups and with tutor interviews,	How have bespoke online social networks have been used to support	Anxiety Transition	Similar perceived benefits across both department networks, including greater familiarity with new people and new places, which seemed to help ease anxieties as students prepared for life at university.	"Very useful because it sort of gave you names of people who are going to be on your course. It gave you a face to recognise".	Wellbeing = Increased familiarity → Reduced anxiety

	Semi-structured interviews with n=7Geography and n=4 English tutors. Age/gender/ ethnicity not reported	(student quant questionnaires also undertaken). Interpretivist, respondent-led analysis. Ning social networking platform: analysis of content added by students also undertaken.	students' transition into higher education during the weeks immediately prior to formal 'on-site' induction.		Pre-induction networking helped alleviate, at least to some degree, anxieties about beginning University including by getting to know people (staff and students). Although some were anxious about taking part. Overall, the focus group data highlight the reassurance provided both through active interaction with others in the weeks leading up to the start of university and the more passive reading of information online.	"I felt a bit worried though because I have issues with spelling, I'm really bad at it, and so I kept having to write a comment and then going oh I have to … copy it onto word and spell check it and put it back."	
Taylor 2018[77] UK	University students and staff n=88 students, various degrees, 72 on-campus, 16 remote. 51 female and 51 male Participants were aged between 18–25 years (mean = 20.88, SD = 1.55). 8 staff: learning technologists, IT support, librarians, academics and administrators.	MIXED METHODS 88 semi structured interviews with students (plus 8 staff) and focus groups. Additional questionnaire. Grounded theory	How new technologies and ubiquitous connectivity affect students' day-to-day life, learning habits and consequent psychosocial wellbeing.	Wellbeing (psychosocial)	Positive experiences which enhance wellbeing included students taking an active role in what they learn, with teacher as facilitator and students learning through collaboration. A common sub-theme was increased flexibility in learning and comments relating to how this encouraged and widened access to materials and enabled self-pacing and reflection. Connectivity brought interaction to a normally isolated learner and improved communication between and among students and teachers and that a peer group can be wider. key themes were produced: Sense of ease and freedom (ease, freedom, control) Improved workflow (confidence, self-efficacy, productivity) Connectedness Security and reassurance. Negative experiences, which led to a diminished sense of wellbeing include	Figure 1: A model of ubiquitous connectivity and psycho-social wellbeing. 1. Sense of ease and freedom: 'Technology changes lives, it has given me ample opportunity to 'google' any queries I may have. 2. Improved workflow: 'It makes you feel good because you don't immediately forget what you just thought of… because if you think about something when you are out, by the time you are at home… if you didn't write it down…you won't remember it again… 3. Connectedness: 'Interacting with new students helped to build	Wellbeing / Good mental health → ease, freedom, engagement and security Poor mental health → Not managing information /unmet communication and support needs.

					the following: stress arising from equipment differences (software/hardware), unreliable connections, lack of technical support and information overload; frustration due to delayed feedback and lecturer reluctance to communicate online. Other impacts related to: the lack of textual skills; additional learning needs; unexpected disclosure, and learning in a foreign language. Three key themes were produced: Stress due to excessive reliance on technology Stress and distraction due to information overload Diminished motivation in attending lectures.	friendships and helped to complete assignments.' 4. Security and reassurance: 'If you are somewhere, if you don't know an information you can always message someone …." Stress due to excessive reliance on technology: 'I am quite reliant on technology and when it doesn't work I don't have a clue where to go from there I just call off and cry… Stress and distraction due to information overload: 'I think it is also difficult to focus on one thing as well, because say that (…) you go to do one task… and you end up finding different things at once, you are not really focused on one thing… Diminished Motivation: 'laziness… you can miss lectures and just look at the power points online and even if you don't get as much information".	
Vasileiou 2019[77] UK	n=15 University students away from home, who self-identified experiencing loneliness.	QUALITATIVE Cross-sectional Semi-structured interviews.	This study sought to examine the coping strategies young adults deploy to	Transition Loneliness Coping strategies	The results demonstrate that participants used a variety of coping strategies to manage the experience of loneliness. Accommodation (mainly in the form of distraction), support-seeking, social isolation, self-reliance, and problem-solving behaviours were	Accommodation "So I would watch a good movie online that I would research for, a list of good movies in advance and when I feel lonely, I would	Coping strategies → Managing loneliness

	9 female, 6 male. Median age 20. 67% British One University	Directed qualitative content analysis	manage experiences of loneliness whilst studying at University.		the most prevalent coping strategies mentioned. Coping reflecting helplessness, escape, submission, and more rarely, opposition, were also found, albeit less often. Coping with loneliness through support-seeking was a prevalent strategy. Students were acutely aware of the need to build and maintain friendships in the new environment in order to alleviate loneliness. Contact and comfort seeking were the most commonly reported objectives of support seeking behaviours, whilst seeking instrumental aid appeared less frequently. Support-seeking was mostly directed to significant others such as family members, friends from home, partners, or friends in the new environment to whom participants felt close. Occasionally health professionals, more distant friends, acquaintances, or peers were also involved. Self-reliance coping describes a turn to the self and personal resources. Emotional regulation was attempted through efforts to logically analyse and understand the reasons for feeling lonely in order to attach a sense-making narrative to the experience. Self-encouragement and self-comforting ideas, such as the thought that the difficult feelings will eventually pass, or that the person is not alone but does have people in their life who	just select one and watch it". Support-seeking "Sometimes I would obviously look to just talk to or chat with people that I haven't talked to in a while. So sometimes you just want to talk to someone and then you think, 'Oh I didn't talk to that person in a while" Social isolation "I think at the very start we didn't really discuss it. I think you feel this need to look strong, like you're not scared of anything because you really want to make friends and you don't want to look like the one who is really missing home and maybe having a little cry at times". Self-reliance "I think admitting it, you don't always need to go and tell somebody else but just recognizing it yourself helps as you can then arrange to meet a friend or go and do something that you find makes you happy". Problem-solving "Like I really made an effort in the first week to try to put	

					are important to them, aimed to regulate emotions. Evidence of cognitive restructuring, minimization, and acceptance of the distressing experience of loneliness also appeared in the data.	myself out there, that's another thing that helped".	

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