Exploring the acceptability of online mental health interventions among University students: Main want and needs for intervention dissemination and uptake.

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Abstract

Background

The student population are at a higher risk of developing a mental health problem than any other population. Approximately 1 in 4 students entering higher education, will report a mental health problem each year. Universities represent a high-risk time for the onset of mental problems, as 75% of all mental illnesses begin by the age of 24, coinciding with the mean age of higher education. Student help-seeking behaviour is also limited with rates of professional helping seeking being low as young people do not seek help for several reasons, including stigma, lack of time, money and a lack of knowledge about services.

Objectives

Giving the increase in independence and ability to become self-reliant as a young adult, mobile health interventions are likely to be preferable to students who favour self-help and so do not reach out for support. If mobile health interventions are to be successfully developed to cater for university student's mental health, there is a need to understand students wants and needs considering they are the end-user. Thus, a survey was conducted with students from a large-sized British university to understand their experiences in seeking support for mental health problems, their awareness and previous use of mobile health interventions, and their willingness to use these resources.

Methods

Participants were 398 students, comprising of foundation, undergraduate, postgraduates and doctoral degrees from the University of Westminster (UOW), a large-sized university located in London, England. They were invited to an anonymous online survey via email. The survey included 18 questions that assessed participants help-seeking behaviour, awareness of available support as well as their experiences and attitudes towards digital health interventions for mental health. All quantitative data analyses were conducted using SPSS Version 25. All responses to open-end questions were analysed using thematically analysed using NVivo to gain insight, knowledge and to validate themes by identifying patterned meaning across the dataset.

Results

A total of 67.16% of participants reported having experienced a mental health

difficulty. The most common mental health issues included Anxiety 82.32%, Stress 76.24% and Depression (75.14%). only 16.11% were receiving treatment and 28.33% had previously received treatment. 25% of respondents were not aware if the university had mHealth interventions and 14.62% of respondents were unsure whether a mHealth based support would be the right thing for them. However, only 8.46% (n=22) had previously used an mHealth app-based support and 11.92% were either currently using this type of intervention or thinking about using a mobile health app.

Conclusions

These interventions were developed out of a need to scale the capacity of the current resources and although they offer many benefits, adoption is low. This may be due to the limited knowledge of this emerging field that could potentially help HEIs in reconfiguring themselves as health promoting and supportive environments. All technology gradually develops and then suddenly is adopted by the majority of people. What is now needed, are controlled trials to pilot these technologies and iterate their development in order to provide maximum value for students. This can be done by truly listening to and co-designing with students to include them in this shared ambition to create innovative and powerful solutions that can contribute to improving mental health outcomes in university populations.

Key words: Mental health, mHealth, Intervention University, Student, Respondents, Participants, University of Westminster, App.

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1. Introduction:

The student population are at a higher risk of developing a mental health problem than any other population. (Australian Bureau of Statistics, 2007). Universities offer the ultimate setting in which to embed a framework that early detects and treats mental health issues, as it is often the first time in young people lives where work, leisure, healthcare and social support are connected in one place. (Univeristiesuk.ac.uk, 2019). Research suggests that rates of mental health disorders are particularly high amongst students, with a threefold increase in students reporting mental health issues since 2016. (Univeristiesuk.ac.uk, 2019). This equates to approximately 1 in 4 students entering higher education, reporting a mental health problem each year. Universities represent a high-risk time for the onset of mental problems, as 75% of all mental illnesses begin by the age of 24, coinciding with the mean age of higher education. (Reavley et al. 2012), (Nami.org, 2019). The time spent in student dorms is critical to shaping our next generations wellbeing. Student help-seeking behaviour is also limited with rates of professional helping seeking being low as young people do not seek help for several reasons, including stigma, lack of time, money and a lack of knowledge about services. (Eisenberg et al., 2007a; Givens and Tjia, 2002) Instead, students usually resort to self-reliance in managing their own mental health. (Lopez et al., 1998).

University Teaching staff are important points of contact in terms of student mental health. This being that academic staff are often the first point of contact when a student is experiencing issues which could be related to their overall health and so staff are in a perfect position to refer students in need to the correct mental health resources. (Teaching & Learning, 2019). However, research suggests students do not believe academic staff are appropriately prepared for this responsibility. Students have stated that academic staff need to develop an understanding of how mental health problems can affect students and empathise appropriately.

University counselling sessions may offer appropriate support to students who are

acknowledged as experiencing difficulty with mental health. Although, counselling services are increasingly in demand in higher education institutes as colleges contend with the rising rates of mental disorders and so, in many campuses the demand for services exceeds available resources. (Supplemental Material for WHO World Mental Health Surveys International College Student Project: Prevalence and Distribution of Mental Disorders, 2018). This results in unmet needs for treatment of mental health problems among university students and although three-quarters of students are aware that their university offers a counselling service, only 30% rate the services as “very helpful”. (Yougov.co.uk, 2019). The average ratio of students to counsellors in large student bodies is 2,624 to 1. (Psychology Today, 2019). Investigation into student counselling services identify that they are frequently under resourced and operate in “crisis mode” with waitlists for much of the year. Students often drop off due to barriers such as the expenses involved with sessions, the inconvenience of session treatment locations and a lack of continued motivation to Attend.

Mental health matters. In this atypical population, it can determine productivity and how they learn. Our understanding and approach to student mental health is a great challenge. (Slade, 2010). Students are a key segment of the population for determining economic growth and a positive screening for depression at university can have a negative impact on exam results, future career prospects and is correlated with approximately 2-fold increase in the chance of dropping out.There is also evidence to suggest that mobile interventions may be a more favourable approach among students. (Davies, Morriss and Glazebrook, 2014). mHealth (mobile- health) interventions offer an ability to improve access to mental health care with the wide usage of mobile devices, empowering those who were unable to obtain it previously or unwilling due to anonymity. (Hollis et al., 2015), (Shim et al., 2017).

Giving the increase in independence and ability to become self-reliant as a young adult, mobile health interventions are likely to be preferable to students who favour self-help and so do not reach out for support. (Davies, Morriss and Glazebrook,

2014). These services have great potential to positively impact mental health care at a population level, considering their ability to be delivered at scale. (Munoz, 2010). However, a concern of this intervention is the level to which the end-user and other stakeholders find it acceptable to receive mental health care through a mobile rather than traditional methods such as one to one with a therapist. (Gilbody et al., 2015).In spite of this, university students may be a population more prone to utilising mobile health interventions such as apps as they offer many of the same benefits as a computer or web based interventions, but in a much more accessible medium that has, for many, become part of the fabric of everyday life. (Davies, Morriss and Glazebrook, 2014).

If mobile health interventions are to be successfully developed to cater for university student's mental health, there is a need to understand students wants and needs considering they are the end-user. Thus, a survey was conducted with students from a large-sized British university to understand their experiences in seeking support for mental health problems, their awareness and previous use of mobile health interventions, and their willingness to use these resources.

2. Method

2.1 Participants:

Participants were 398 students, comprising of foundation, undergraduate, postgraduates and doctoral degrees from the University of Westminster (UOW), a large-sized university located in London, England. The demographics of this group is provided in Table's (1, 2, 3, 4). The research participants composed of 74.39% females and 25.26% males. The average age of each participant was 22, and ethnicity varied with predominantly Caucasian decent (51.23%), and Asian (26.32%).

Table 1:

#	Answer	Bar	Response	%
1	Undergraduate Degree		257	90.18%
2	Postgraduate Taught Degree e.g. (BSc)		23	8.07%
8	Doctoral Student		1	0.35%
9	Foundation Degree		4	1.40%
	Total		285	100.00%

Table 2:

#	Answer	Bar	Response	%
1	Male		72	25.26%
2	Female		212	74.39%
3	Other		1	0.35%
	Total		285	100.00%

Table 3:

#	Answer	Bar	Response	%
4	Home (UK)		149	59.84%
5	EU		48	19.28%
6	International		52	20.88%
	Total		249	100.00%

Table 4:

#	Answer	Bar	Response	%
8	White		146	51.23%
13	Mixed or multiple ethnic groups		19	6.67%
14	Asian or Asian British		75	26.32%
15	Black, African, Caribbean or Black British		28	9.82%
16	Other Ethnic Group		17	5.96%
	Total		285	100.00%

The majority of participants were undergraduate students (90.18%) and Postgraduate students (8.07%). The population sample included Home (59.84%), EU (19.28%) and International students (20.88%). The most common year of study in order amongst the participants were, ‘third and final year’ 47.72% (136), ‘first year’ 18.95% (54), ‘second year 14.39% (41)’, ‘forth year final’ 8.42% (24), ‘third-year’ 6.67% (19), ‘other’ 2.81%(8) and ‘fourth year’ 1.05% (3).

2.2 Procedure:

The study was reviewed and received full Ethical approval by the University of Westminster Psychology Research Ethics board and CTI committee. (CTILTRC-1819-02). Starting on March 4th 2019, the research team invited participants to participate in an anonymous online survey via email. The emails were sent out in batches with the support of academic staff and student accommodation staff. Posters were placed on each UOW campus with a QR code for students to scan and participate on their mobile. A full Information sheet was provided to inform participants and a consent form was selected before access was given to the survey. All participants were asked,” Are you a student at the University of Westminster?”. If participant’s selected no, they were thanked and taken to the end of the survey. Only University of Westminster students were eligible to participate. The survey remained open for 7 weeks.

2.3 Measures:

Firstly, participants were asked to provide the following information about demographics and academic status: age, gender, ethnicity, if they were Home, EU and/or International students, level at which participant studies (degree type), year of study the participant was in and whether they would like to leave their contact

email to receive information on the progress of the project.

2.3.1 Experiences with mental health

Participants were asked a set of 7 standardised questions in the form of a shortened version of the Warwick-Edinburgh Mental Well-being Scale (SWEMWBS), a scale of positively worded items for assessing a populations wellbeing. Following this, students were taken through the Perceived Stress Scale 4 (PSS4), one of the most widely used psychological instruments for measuring the perception of stress. This is a shortened version of 4 questions to measure the degree of which situations in one's life are considered stressful. In addition to this respondent were asked a yes/ no question: (1) 'Have you ever experienced a mental health difficulty?'. Skip logic was used to create a custom path for the response to this question. Respondents who answered 'no' skipped the following questions which asked: (2)' if you answered yes, how would you describe this?'. The survey encouraged participants to share their experience with mental health by asking: (3) 'Are you receiving treatment for this?' and the choice was asked for students to elaborate on this with: (4) 'Write here if you would like to elaborate the reason for the previous answer:'.

2.3.2 mHealth awareness, behaviors and attitudes

There were 18 questions included in the questionnaire that assessed participants' help-seeking behavior, awareness of available support as well as their experiences and attitudes towards digital health interventions for mental health. Digital Health interventions were defined as mobile health (mHealth) solutions such as apps and chat-bots. Participants were asked the following question to assess their likelihood for seeking help: 'If you were having a personal or emotional problem, how likely is it that you would seek help from the following?'. This question was asked 11 times for each option, which included: (1) Partner, (2) Friend (Not related to you), (3) Parent, (4) Other relative / family member, (5) Family doctor/ GP, (6) Tutor/ other

member of academic staff, (7) Mental health professional (e.g. university counsellor), (8) Phone helpline (e.g. Hope line, Samaritans, Nightline),(9) Support Website e.g. (student minds), (10) Mobile Health APP (mHealth) , (11) Digital Chatbot support. Additionally, respondents were asked 2 yes/no questions relating to their awareness of support available to them, this included: (1) 'Do you have a GP? (Doctor)', 'Are you aware of the mental health & wellbeing support available to you at university?'. Students were asked 5 questions relating to their experience and attitude towards the use of digital health interventions for mental health to obtain information on the main wants and needs of students when it comes to utilising these interventions:

1. What outcome would you like to gain from using an mHealth app to better health and wellbeing? (how could an mHealth app support your health & wellbeing?)

2. Select if you would like any of the following additional support provided in the app. - Selected Choice

3. Select if you would like any of the following additional support provided in the app. - Selected Choice

4. Select if you would like any of the following additional support provided in the app. - Is there anything else you would like to add? - Text

5. The app could also include the possibility to join other students of the same university to reduce stress by providing you with useful information about free events, sports and relaxation societies.

6. With respect to the material provided above, are there any recommendations, opinions or ideas that you would like to communicate to us? We strive to make your experience the best possible so every comment is deeply Appreciated!

2.4 Qualitative Analysis

Are you receiving treatment for this?
Q17 Write here if you would like to elaborate the reason for the previous answer:

In the first question, participants were asked to elaborate on reasons for why they did or did not seek treatment. 36 students responded. A qualitative analysis was conducted on these responses, whereby five common themes were constructed from the data.

Firstly, there appeared to be a lack of understanding with regards to whether their issues reached the requirements to seek professional help. This was due to the problem not being constant and thinking that it will disappear on its own. This resulted in 1 student only seeking help when they reached their lowest point. The theme 'Not severe enough' was counted to be reoccurring in the responses 7 times.
Secondly, comments from 6 students fell under the theme 'treatment was not needed'. In this category, the respondents gave examples of their problem being short-lived, leaning on close friends, using self-help methods and their university GRIT program.

Thirdly, 6 students mentioned that they had 'problems with their GP'. These included not having a GP, having a GP who was unhelpful, being too uncomfortable with going to a GP and being sent away with ineffective medication.
Fourthly, the theme of 'long waiting lists' occurred in 5 responses, with this putting 2 students off from getting treatment and forcing 1 student to go abroad to receive treatment because the NHS failed them.
Lastly, the theme of 'time constraints' reoccurred in 3 responses, with 1 student mentioning that they had to end counselling because of long working hours and it taking up too much time.

Below are a few examples of the responses received:

“I have not registered a GP. Also, my friends tell me it's super long wait to get treatment, if any. I just give up.”

“I dealt with it myself and overcome it with self-help methods. Though I still feel stressed and the need for perfection from time to time.”

“I’ve never thought my case is “bad” enough as I have moments when I’m really happy and moments when I feel down. At a previous question I checked “anxiety” as I am in a good place right this moment, but when I’m down I’d probably say depression. I wanted to book an appointment for support through the university once, however I realized that by the time of the meeting I’ll be well again and probably wonder what I’m doing there and that it’s just in my head. Honestly, as I’ve never had support, I can’t tell if it’s real or I’m just overthinking.”

“I don’t like going to the GP, especially if my probably is physically painless. Although, when I was going through depression, my friend was going to take me because it got bad.”

“Antidepressants. Also, used university facilities (counselling) but had to stop due to working hours. After coming back sometime later I've been informed that my counsellor left, and I didn't bother trying to establish a new connection.”

Not severe enough (not constant, thinking it will go away)	7
Treatment was not needed (short-lived, leaning on close friends, self-help methods, university GRIT program)	6
Problems with their GP (not having a GP, having an unhelpful GP, being uncomfortable with visiting a GP, ineffective medication)	6
Long waiting lists (waiting for treatment, let down by the NHS, put off seeking help)	5
Time constraints (too busy, long working hours)	3

Q.20 (an extension of Q.19). If you feel we have missed something from this list and there is someone else you have turned to for help or advice, please let us know here:

In this question, participants were asked to list any other sources of help that they would seek when having an emotional problem. 9 students responded. A qualitative analysis was performed on these responses, whereby three themes were constructed from the data.

The first theme was named ‘religion and spirituality’ which reoccurred in the responses 3 times. In this category, the participants mentioned seeking support from a faith advisor for meditation purposes, spiritual guru and their church.
The second theme constructed from 2 responses was ‘friends and family’, with 1 student emphasising only going to close friends at university.

1 respondent fell into the third theme ‘community chatroom’ in which they preferred to be disorder-specific. It is worth noting that 1 student mentioned some uncertainty around what a support website, digital chatbot and mental health APP would entail.

Religion and spirituality (faith advisor for meditation, spiritual guru, church)	3
Friends and family (close friends at university)	2
Community chatroom (disorder-specific)	1

Below are a few examples of the responses received:

“Spiritual and faith advisor at university (for meditation practice)”

“Other students at the university - there is only one of my fellow students I feel comfortable talking to as I have experienced judgement from other students”

“I’m not sure if this would count under support website but if not, I often use a disorder-specific subreddit, I would be most likely to go here if it wanted online support, whether that’s posting myself for help or just reading other people’s experiences and realising I’m not alone is enough to help.”

Q25. What outcome would you like to gain from using an mHealth app to better health and wellbeing? (how could an mHealth app support your health & wellbeing?)

In the first half of the question, participants were asked what outcome they wished for when using a mental health app. In the second half, respondents were asked for their thoughts on how they believed a mental health app could support their health and wellbeing. 76 students responded. A qualitative analysis was performed on these responses, with two themes reoccurring in the data with regards to the first half of the question. Four main themes were constructed from the data in relation to the second half of the question.

Part 1. What outcome would you like to gain from using a mHealth app to better health and wellbeing?

Firstly, 16 respondents were counted as falling under the theme 'improved wellbeing.' In this category, respondents mentioned increased confidence, improved mood, more motivation, thinking more positively, increased control over thoughts and better management.
Secondly, the theme of 'increased relaxation' occurred in 11 responses. In this category, students mentioned that the app would make them sleep better, feel more grounded, feel calmer, reduce stress during the exam period and reduce distress.

Below are a few examples of the responses received:

"I think the app would be good for grounding me when I'm panicking."

"to calm my nerves when my exam is nearer."

"be more focused and feel more in control of thoughts and feelings that can occur at any time."

Improved wellbeing (increased confidence, improved mood, more motivation, increased positivity, increased control over thoughts, better management)	16

Increased relaxation (sleep better, feel more grounded, feel calmer, reduce stress during the exam period, reduce distress)	11

Part 2. how could an mHealth app support your health & wellbeing?

The first theme was named ‘coping mechanisms.’ In this category, the respondents gave the following examples: ways to cope with university stress, positive quotes, daily tips, changing negative thoughts, a CBT guide and coping with workload. This theme was counted to be reoccurring 21 times.

16 respondents fell into the second theme of ‘live chat rooms.’ The respondents wanted a place to vent their emotions, instant support, a support network, an anonymous discussion page and access to other students with mental ill-health as well as professionals.

The third theme ‘mental health information’ occurred in 13 responses. In this category, students mentioned self-care and medication advice, available facilities within the university, clarity on what mental illness is and information provided on how to find a psychologist/counsellor.

Finally, a fourth theme constructed was ‘stress-reducing techniques.’ Students in this category emphasised the need for app to be engaging through meditation guidance, breathing techniques and yoga exercises. This theme was counted to be reoccurring in the responses 12 times.

Below are a few examples of the responses received:

“I currently use the calm app- it helps with stressful times with its background noises. However, I think it is not overly focused on actual mental health issues. Things like chat boxes, or anonymous discussion pages would be good.”

“to offer variety- headspace simply offers just the voice of a man. Would be helpful to have yoga on this app potentially or some stretching exercises.”

“Providing easy access to clear information about mental health and the facilities available, easily readable and digestible feature to book appointments and some form of chat system to decide if you have need of their support.”

“Daily reminders/tips, quotes that are tailored to help clear mind (related to stress/anxiety/depression).”

Coping mechanisms (ways to cope with university stress, positive quotes, daily tips, changing negative thoughts, a CBT guide, coping with workload)	21
Live chat rooms (vent emotions, instant support, support network, anonymous discussion page, access to other students struggling, access to professionals)	16
Mental health information (self-care & medication advice, available facilities within the university, clarity on what mental illness is, information provided on how to find a counsellor/psychologist)	13
Stress-reducing techniques (meditation guidance, breathing techniques, yoga exercises)	12

Q.26 Select if you would like any of the following additional support provided in the app. Is there anything else you would like to add?

Anonymous chatroom (must be moderated)	2
Physical activity (yoga, fitness/nutrition tips)	2
Positivity (motivational speakers/quotes, preachers)	2
Professional help (face to face, real professional behind chatbot)	2

Q.27. The app could also include the possibility to join other students of the same university to reduce stress by providing you with useful information about free events, sports and relaxation societies.

With respect to the material provided above, are there any recommendations, opinions or ideas that you would like to communicate to us? We strive to make your experience the best possible, so every comment is deeply appreciated!

The participants were asked to give their recommendations, opinions and ideas on what they wish the app to direct them to with regards to useful information about free events, sports and relaxation societies. 50 students responded. A qualitative analysis

was carried out on these responses, with five main themes being constructed from the data.

Firstly, students gave recommendations on how they wanted the app to deliver the information to them. The respondents wanted the app to have automated text messages, a platform for others to share previously used services, a section offering support for suicidal feelings, information about events offered in different languages, links to podcasts, optional anonymity and avoidance of long questionnaires. The theme of “app features” was counted to be reoccurring in the responses 19 times.
Secondly, with regards to what respondents wanted the app to direct them to, 12 fell into the theme of ‘regular information sessions.’ In this category, the participants gave examples of these sessions, such as: nutrition & mental health, understanding the brain, normalising mental ill health, increase awareness in academics, improving wellness).

Thirdly, a theme of ‘de-stress events’ was constructed from 10 responses. Respondents wanted to receive information on art therapy, puppy days, animal visits, music practice rooms, spa and massages as well as free tea and coffee).
Fourthly, 10 respondents fell into the theme of ‘outside support groups.’ In this category, participants wanted to have a space to express their emotions and build a community. They also wanted these groups to be moderated, tailored to specific needs and receive lists of other attendees via the app.
Lastly, the theme of ‘physical activities’ was constructed from 5 responses. In this category, the respondents gave examples of group meditation, yoga sessions, sporting activities and physical exercise advice.

Below are a few examples of the responses received:

“I think there should be something for when you’re feeling suicidal. Many students, especially those having a hard time with mental health, experience suicidal thoughts and feelings during exam time etc. And I think it would be really good to have

something, like a section to reassure you or where you could speak to someone with experience with these feelings that could help ‘talk you down’ I guess.”

“Regular group support sessions for those who have mental health issues - knowing I wasn't alone and having a safe place to express the issues I was having to those in a similar situation would have been great.”

“Regular de-stress events on campus, especially towards exam or deadline times. My study abroad course in the US had complimentary massages, free tea/coffee outside the library at night during the days before deadlines, relaxation events and places, and puppy days where students could de-stress by playing with cute fluffy dogs. Their program worked well to reduce stress.”

“Things like Pilates/yoga classes and relaxing exercises as a group would be good”

“This survey is the first time I've ever heard of mHealth. If the uni feels this might be beneficial to the mental health of students, they should communicate what it is regularly.”

App features (avoid long questionnaires, automated text messages, platform for others to share previously used services, a section offering support for suicidal feelings, offer in different languages, links to podcasts, optional anonymity)	19
Regular information sessions (nutrition & mental health, understanding the brain, normalise mental ill health, increase awareness in academics, improving wellness)	12
De-stress events (art therapy, puppy days, visiting animals, music practice rooms, spa & massages, free tea & coffee)	10
Outside support groups (emotional expression, community building, must be moderated, tailor for specific needs, provide lists of other attendees via app)	10
Physical activities (group meditation & yoga sessions, sporting activities, physical exercise advice)	5

2.5 Statistical analysis:

All quantitative data analyses were conducted using SPSS Version 25. Logistic regression analyses were used to examine the relationship between respondents demographic and academic characteristics and participant's experiences with mental health issues and their m-Health awareness, behaviours and attitudes. Demographic predictors included: age (years, gender (male = 0, female =1), ethnicity, student status, level of study(degree), and year of study. All responses to open-end questions were analysed using thematically analysed using NVivo to gain insight, knowledge and to validate themes by identifying patterned meaning across the dataset. Responses to the question, 'What outcome would you like to gain from using an mHealth app to better health and wellbeing? (how could an mHealth app support your health & wellbeing?' were coded using grounded theory Martin and Turner, 1986), by which similar themes were formed containing similar 'concerns within the responses. The themes that were found are shown in Table 5 and ordered by the number of concerns in each theme. Direct quotes are used to demonstrate emerging themes.

3. Results

3.1.Response rate

The total enrolment of students in the University of Westminster population was not available for the year of 2019. However, the most recent figure provided online was 20,000 students in 2014. (Westminster.ac.uk, 2019). With reference to this figure, Qualtrics sample size calculator was used to find that our sample size correlated with a 95% confidence level and 5% margin of error for a representative sample of the University of Westminster. This accuracy may be larger due to the fall in University

numbers with external factors in the UK to date such as Brexit.

3.2.Experiences with student mental health

A total of 67.16%(n= 180) of participants reported having experienced a mental health difficulty. When compared with the standardised scales for ‘Perceived Stress’ and ‘Mental wellbeing’ correlations were found in moderate levels of low mental wellbeing amongst this population as all respondents registered under a score of 40 for the Warwick Edinburg Wellbeing Scale which in population norms is classified as ‘possible depression’. In addition to this, the results of the Perceived Stress Scale indicated a mean score of 8.1 for perceived stress. This can be interpreted as moderate stress. Furthermore, the most common mental health issues included Anxiety 82.32% (n = 149), Stress 76.24% (n= 138) and Depression (75.14%). This supports current population facts on the main mental health issues experienced by students. (Yougov.co.uk, 2019). Of participants who answered yes to experiencing a mental health issue only 16.11% were receiving treatment and 28.33% had previously received treatment. When respondents were asked the elaborate on the previous answer, of those 55.56%(n=100) who had never received treatment, these reasons included; “I don’t like going to the GP.”, “No Time.”, “The process of gaining treatment is complex and often reliant upon anti-depressants or antibiotics.”, and” Shame”.

Table 5

Thematic categories representing the wants and needs of students when using mhealth (mobile health) interventions to better mental health. Ordered by number of concerns in each theme.

Theme	Number of concerns relating to theme	Example quotes
1. Providing tools to allow the ability to help self-manage	n = 13	*"Be more focused and feel more in control of thoughts and feelings that can occur at any time."* *"Something that allows you to be calm, and one that gives logical methods to help."* *"To be able to keep my mental health issues in check, by monitoring my mood and getting advice on how to handle difficult situations."* *"Quick solutions (or at least methods to overcoming)"* *"Deal better with the alone"* *"An app which will help me when/if i felt down or unable to cope with things "* *"Allow me to anonymously seek help at any time."* *"I would like to have more access to support and more access to ways in which I can support myself I.e. through options that give fit around a busy schedule "* *"Advice on how to get better."*
2. Recommendation of resources and advice would be helpful.	n= 11	*"Providing easy access to clear information about mental health and the facilities available, easily readable and digestible feature to book appointments and some form of chat system to decide if you have need of their support."* *"Tips and info."* *"I do not like talking about my problems but I prefer reading up on it and having support through online sources such as apps, websites, youtube. I would want daily advise and perhaps reminders on what I can do to help my mental health."* *"Consolidating resources to find counsellors/psychologists best suited to me."* *"Possibly provide tips on how to deal with certain thoughts* *Information and advice. Providing options and quick tips and techniques"*
3. No concerns, positive views	n= 8	*"It would help to make me feel more motivated and optmistic about work loads etc"* *"Help with the stress that comes with university"* *"Anything to relieve pressure/stress/anxiety or remind you that the issues are there to be broken down and conquered."* *"Things like chat bots, or anonymous discussion pages would be good."*
4. Speaking with other students would be beneficial.	n= 7	*"Support groups, building confidence especially for university"* *"Access to previous student accounts who have had issues with their mental health whilst studying."* *"Maybe connecting with other students to talk about worries"* *"Talk to a former student who suffered with similar issues."*
5. Concerns, would not use a health intervention.	n= 6	*"I wouldn't use it if I'm being completely honest "* *"I guess if I knew what an app should do to help me i'd just do it myself. I don't have an answer sorry."* *"I do not wish to use the app."*
6. Concern, Face-to-face care is more efficient.	n= 2	*"I just don't know how it would be more helpful than physical contact help "* *"I don't think I would ever use it. When you're facing problems, you want to talk to a real person about it so unless you have live people chatting with you via the app, it's not for me"*

3.3. M-mental health intervention awareness, behaviors and Attitudes.

Participants help-seeking behaviour was analysed by assessing the likelihood that students would seek help from a range of sources when experiencing a personal or emotional problem. The results of this indicated a ‘Partner’ was the main source to seek help from 21%, second to this was ‘Friend’ with 11% and Parent 10%. Of digital interventions ‘Support Websites’ were the highest-ranked source of action (%) and ‘Mobile health apps’ (6.89%) were a more probable source of action than a university tutor or other member of academic staff (6.86%). The results of this analysis can be found in Table 6.

To further investigate help seeking behaviour, participants were asked if they had a GP. 87.64% (n=234) responded ‘yes’ and 12.36% (n=33) no. Furthermore, only 63% of participants were aware of the mental health & wellbeing support available to them at university and so 37% were not informed on how they could be supported by the university if they were to experience a mental health issue.

Table 7 represents the respondent’s experiences and or potential use of mHealth interventions to better mental health outcomes. The majority of participants did not know enough about these interventions in order to make the decision if they are right for them (n=104) and 25% were not aware of the university had such resources available for students. In addition to this 14.62% of respondents were unsure whether a mHealth based support would be the right thing for them. However, only 8.46% (n=22) had previously used an mHealth app-based support and 11.92% were either currently using this type of intervention or thinking about using a mobile health app.

Table 6

Source	Likelihood(%)
Partner	21%
Friend (Not related to you)	11%
Parent	10%
Mental health professional (e.g. university counsellor) = 266	9%
Family doctor/ GP	8%
Other relative / family member	8%
Support Website e.g. (studentminds)	7%
Mobile Health APP	7%
Tutor/ other member of academic staff	7%
Digital Chatbot support	6%
Phone help line (e.g. Hopeline, Samaritans, Nightline)	6%
	100%

Table 7

Participant experience of mHealth apps and/or potential use of them.

Item	n(%) agree or strongly agree
mHealth apps:	
I don't know enough about mHealth apps to decide whether or not its right for me.	104 (40%)
I don't think there are any mHealth apps running at my university	65 (25%)
I'm unsure whether an mHealth app based support would be the right thing for me.	38 (14.62%)
I have previously used an mHealth app.	22 8.46%
I have thought about using an mHealth app, but have not yet.	17 (6.54%)
I am currently using an mHealth app.	14 (5.38%)

4. Discussion:

This study examined the acceptability and experience of mHealth interventions to manage mental health and wellbeing, amongst university students at the University of Westminster. It should be noted that results of this study may be venerable to response bias and should be interpreted with care. It is likely possible that those who responded to this survey had encountered a mental health issues or utilised mHealth interventions previously and so we're more inclined to take part. In addition to this, the timing of the survey clashed with student exams. This a busy time of the year which could be correlated with higher stress levels, thus findings from this research may not be representative of the wider views and experiences of the UK student population.

The results of the survey suggest that the majority of university students encounter mental health problems whilst at university and that they feel insufficiently informed on how to deal with these issues. 55.56% of students reported having never received treatment. This is consistent with the evidence that suggests that university support services demand far exceeds the current resources. (Supplemental Material for WHO World Mental Health Surveys International College Student Project: Prevalence and Distribution of Mental Disorders, 2018). Furthermore, with up to 36.7% of students not being aware of the available support for mental health issues at university, there is a need for interventions and strategies that improve awareness and accessibility to the appropriate resources. However, of those who have received support from a university counselling service, only 30% rated the service as “very helpful. (Yougov.co.uk, 2019). This highlights the need for alternative interventions that are co-designed with students, for the specific wants and needs of the varying student characteristics of today, as reliance on a deficit model needs to be replaced with an innovative strategic approach. (Universitiesuk.ac.uk, 2019).With 67.16% of students expressing that they have experienced a mental health issue at university, this could be explained by current research in that students studying at large higher education institutions are more likely to screen positive for depression and anxiety.

(Mackenzie et al., 2011). In addition to this, large institutions have much lower treatment utilisation, consistent with the study which found 55.56% of students had not received treatment for a mental health problem. Large institutions on average lack a sense of community as although larger enrolment have access to more social interactions, students can feel less connected to their community. Moreover, the University of Westminster is a public university which usually have fewer resources for students to access than private institutions. (Jaworska et al., 2016).

On average participants held positive views on mobile health interventions in terms of supporting their mental health and wellbeing whilst at university. To help address the increasing demand for mental health support, mobile-based resources could prove to be the most suited support tool for students. These interventions have been cited as an approach that may be considerably more engaging and useful for students given their limited help-seeking behaviour. Although, the study found limit numbers of students using mHealth interventions, this is mainly due to a lack of knowledge on the impact they can have. These interventions offer a number many more important benefits to students such as, reducing barriers to treatment, such as price, stigma and inconvenience. Mobile health interventions can offer personalised approaches to each individual students need and enable higher education institutes to reconfigure themselves as health-promoting and supportive environments. However, in order for mHealth interventions to be successful gatekeepers such as academic staff must buy into the benefits these technologies can bring to students as they are the gateway and in many instances the first point of contact for students experiencing trouble. Notwithstanding this limitation, research suggests that students believe teaching staff are not adequately prepared for this role. (Macaskill, 2013). This is further supported in the findings of this study as only 6% of students indicated that they would seek support from a member of academic staff.

4.1 Limitations

An important limitation associated with this study is the response bias, considering responders were more likely to have have experience with a mental health problem

than non-responders. This may have resulted in an over-estimation of some results. In addition to this, a major limitation could be the sampling strategy, as the invitation email was sent to a limited amount of specific campuses due to the research teams accessibility. This may have resulted in some participants who were eligible not receiving the invitation. Other limitations include the wording certain questions such as asking students if they had a GP could have been more effectively analysed if they were ask,' did you register with a local GP when moving to university?'. Additionally, confusion can occur due to the various terminologies given to these interventions. The accuracy of the standardised scales to measure wellbeing may also be limited as the shortened version of each was used and may not have the confidence level of the full scale. Lastly, the findings may not represent the wider views and experiences of the students within a higher education institute

4.2 Conclusions

The empirical findings in this study provide a new understanding of the wants and needs of students when it comes to using mobile health technology to better mental health outcomes. These interventions were developed out of a need to scale the capacity of the current resources and although they offer many benefits, adoption is low. This may be due to the limited knowledge of this emerging field that could potentially help HEIs in promoting good mental health and well-being to its population and support students' academic performance. As with all technology, it gradually develops and then suddenly is adopted by the majority of people.
What is now needed, are controlled trials to pilot these technologies and iterate their development in order to provide maximum value for students. This can be done by truly listening to and co-designing with students to include them in this shared ambition to create innovative and powerful solutions that can contribute to improving mental health outcomes in university populations.

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