Understanding how medical students make sense of their relationship with the online world

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Abstract

Introduction: Internet addiction has been found to be prevalent in medical students, but only quantitative literature has been found in this area. Existing literature provides information about prevalence rates and associated risk factors, but does not allow for the elicitation of individual experience and the depth of information this brings. Further, no studies have been conducted with medical students in the United Kingdom (UK). The aim of this study was to explore how medical students in the UK make sense of their use of the online world.

Method: A qualitative method was chosen for this study to examine this area in more depth. Seven University of Leeds medical students were interviewed for this study. Semi-structured interviews were conducted and transcribed verbatim. Interview data was analysed using interpretative phenomenological analysis.

Results: Socialisation to the online world was the overarching theme identified in this study. Four superordinate themes were also identified: transition to medical school life; trapped by the online world; feel a sense of belonging and connection; and the offline world is not as appealing as the online world. There were a number of subthemes identified within the overarching and superordinate themes.

Discussion: The findings are discussed in the context of psychological theories of Internet addiction and the wider literature in this area. This allowed for an examination of Internet addiction and whether this was what was being experienced by medical students. Strengths and limitations, clinical implications and recommendations from the study are provided. Finally, suggestions for future research are presented.

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Introduction

Medical students embark on a five-year course designed to equip them with the skills required to become a qualified medical professional. Throughout their training, medical students have consistently heavy workloads, are continually assessed via examinations, academic assignments, and on clinical placements. Medical students are required to act in accordance with the General Medical Council (GMC), a professional body overseeing the conduct of doctors and medical students in the United Kingdom (UK). Prior to starting the course, most medical students would not have been required to act in accordance with guidelines set by a professional body or have professional responsibilities. The transition from pre-medical school education to starting the course can be a challenging time for medical students. Many students move away from their family and friends (support networks) to unfamiliar areas and thus also have to adapt to living life independently and making new connections to others (e.g. friends). Use of the online world could be a way in which medical students cope with being at medical school. Whilst using the online world can be helpful, it is also possible that it can lead to problematic Internet use.

This chapter aims to provide an overview of the literature in this area, and provide a rationale for this thesis. To do this, it starts by discussing literature related to mental health problems in undergraduate students more generally, and then more specifically to medical students. Next, definitions of online, the Internet, and Internet addiction are provided. This is followed by a discussion of Internet addiction, again in undergraduate students more generally, then focussing in on medical students. Internet addiction and coexisting psychopathology is outlined, along with other factors associated with Internet addiction. Psychological theories that can help understand problematic Internet use are then explored, and to what extent these theories help us make sense of Internet addiction in medical students. Finally, an explanation of why qualitative research needs to be conducted follows, and the question this thesis aims to address will be presented.

1.1. Mental health problems in undergraduate students

Eisenberg, Gollust, Golberstein, and Hefner (2007) conducted a study with 1,181 undergraduate university students (referred to as university students or students hereafter) in the United States (US). They found 15.6% of university students to be experiencing anxiety or depression (measured using the Patient Health Questionnaire-9 (PHQ-9)), and that 22.4% of students were identified as having more than one condition. Another study conducted in Turkey (N = 1,617), found moderate levels of stress (27%), anxiety (47.1%) and depression (27.1%) (measured using the 42-item Depression Anxiety and Stress Scale (DASS-42)) in university students, and severe or extremely severe levels of stress, anxiety and depression in 6.9%, 20.8% and 8.1% of students respectively (Bayram & Bilgel, 2008). Stallman (2010) found 64.7% of university students (Australian sample, N = 4,961)) to have 'mild-moderate mental illness' and 19.2% a 'serious mental illness' (as defined by the K10 measure of anxiety-mood disorders (Kessler, Barker, et al., 2003)). Different measures were used in each of these studies, which makes comparing the results more difficult. The studies were also conducted in different countries, so cultural differences could have contributed to differences in results. However, all measures used have been validated and found to have good psychometric properties, increasing confidence in the findings. Whilst causality cannot be inferred from these studies due to them being cross-sectional, they have allowed researchers to get an idea of the prevalence of mental health problems in university students. Further, these studies all had large sample sizes allowing for more reliable results.

1.1.1. The development of mental health problems in undergraduate students

Macaskill (2013) conducted a cross-sectional study in the UK that examined mental health in university students (N = 1,197) across different years of study (first year to third year). University students in their second year of study were found to have the highest rates of mental health problems with 23.1% of students found to be meeting 'psychiatric caseness' (as defined by the General Health Questionnaire-28 (GHQ-28), which measures somatic symptoms, anxiety and insomnia, social dysfunction, and depression), compared with 12.9%, 11.9%, and 18.6% at admission

to university (start of first year), six-months into first year, and mid-third year respectively. Psychiatric caseness for the total sample was 17.3%, which is a similar figure to that of the UK general population (17.6% (Macaskill, 2013; McManus, Meltzer, Brugha, Bebbington, & Jenkins, 2009)). The cross-sectional design meant that the mental health of the same students was not assessed across all three years, so it is not known if there were any changes in student's mental health over time. Bayram and Bilgel (2008) found that anxiety, depression and stress scores were higher in first and second year students.

Seventy-five per cent of mental health problems have been found to develop between the ages of 15 and 25 (Kessler et al., 2005; Kim-Cohen et al., 2003), which is the age-range most university students fall within (e.g. Eisenberg et al., 2007). This suggests that students are already at higher risk of developing mental health problems because of their age. Students *'living with parents or guardians'* and who grew up in *'poor'* or '*well-to-do'* families, have been found to report more suicidal thoughts than those not living at home and who grew-up in families who had *'Enough, but not many extras'* or were *'Comfortable'* (Eisenberg et al., 2007). Financial difficulties have been found to result in higher rates of anxiety and depression (Bayram & Bilgel, 2008) as well as distress (Stallman, 2010) in university students. Other predictors of distress include being a full-time student, being aged between 18 and 34 years, and being female (Stallman, 2010). Female students were found to have higher rates of anxiety than male students (Bayram & Bilgel, 2008; Eisenberg et al., 2007) as well as stress (Bayram & Bilgel, 2008) and psychiatric caseness (Macaskill, 2013). Students who identified as bisexual were more likely to be depressed than heterosexual students as were students who identified as *'other race'* (Eisenberg et al., 2007). It was not clear from this study whether *'other race'* meant all non-white participants or participants who identified as being of a race other than those that were an option in the questionnaire (e.g. not White, African-American/Black, Hispanic Latino etc., but another race not identified by the questionnaire). Finally, individuals who are identified as having a mild-moderate illness have been found to be more at risk of developing a serious mental illness (Kessler, Merikangas, et al., 2003). Whilst a number of the aforementioned studies show most students who do have mental health difficulties have mild to moderate levels of severity, these students are at risk of developing more serious mental health problems in the future, and are thus still a

cause for concern. It is clear that there are a number of socio-cultural factors and university related factors that can increase the risk of students experiencing mental health problems whilst at university.

1.2. Mental health of medical students

Research conducted in the US found that medical students report higher rates of psychological distress than non-medical students (Dyrbye et al., 2011; Dyrbye et al., 2007; Dyrbye, Thomas, Huntington, et al., 2006; Dyrbye, Thomas, & Shanafelt, 2006; Dyrbye et al., 2014; Ghodasara, Davidson, Reich, Savoie, & Rodgers, 2011; Hill, Goicochea, & Merlo, 2018). At the start of their programme of study, medical students have been found to have similar levels of psycholological health to their non-medical peers, which suggests that medical school is a contributory factor to psychological distress (Brazeau et al., 2014; Hill et al., 2018; Rosal et al., 1997; C. K. Smith, Peterson, Degenhardt, & Johnson, 2007).

1.2.1. Stress

Stress can be defined as *'the state of a body threatened by imbalance under the influence of agents or conditions endangering its homeostatic mechanisms'* (as cited in Nechita, Nechita, Pirlog, & Rogoveanu, 2014, p.1263, original reference not used as not in English language). The level of stress in medical students has been found to be between 29.5% and 59.9% (Ediz, Ozcakir, & Bilgel, 2017; Fawzy & Hamed, 2017; Iqbal, Gupta, & Venkatarao, 2015; Javaeed, Zafar, Iqbal, & Ghauri, 2019; Kumar et al., 2019; Moutinho et al., 2017; Radeef & Faisal, 2018; Zyl et al., 2017), with 2.4% to 13.1% reporting severe or extremely severe levels of stress (Hill et al., 2018; Iqbal et al., 2015; Javaeed et al., 2019). High levels of stress have been found to lead to depression in medical students (Mosley et al., 1994; Rosal et al., 1997; Stecker, 2004), with both anxiety and depression being associated with their vulnerability to stress (Bunevicius, Katkute, & Bunevicius, 2008; Hill et al., 2018). Physical symptoms (Mosley et al., 1994), poor academic performance (Hojat et al., 1993; Linn & Zeppa, 1984), suicidal ideation (Compton, Carrera, & Frank, 2008; Dyrbye et al., 2011), and lack of empathy (Neumann et al., 2011) have also been identified as negative effects of stress in medical students. Not only can these factors lead to

increased distress in medical students, but it is possible this could have adverse effects on the care received by patients.

1.2.2. Medical student stressors

Firth (1986) investigated sources of stress in 318 fourth-year medical students attending the Universities of Leeds, Manchester and Sheffield, using an open question where students were asked to describe a recent stressful event related to medical school. Medical students reported talking to patients to be the most stressful element of medical school (n= 61 (20%)), and of these students most (n = 56 (91.8%)) stated that talking to psychiatric patients was most stressful (Firth, 1986). However, the study took place at the start of the student's psychiatric placement, so this could have led to increased reports. The effect on personal life (12%), presenting cases and performing in ward rounds (12%), and dealing with death and suffering (10%) were the next most frequently reported stessors to medical students (Firth, 1986).

Another study used both fixed-choice (quantitative) questions and an open-ended (qualitative) question to elicit stressors in medical students (years one to five) (Hill et al., 2018). Fixed-choice responses (N = 987) found academic workload and issues with work-life balance to be the top stressors for medical students (Hill et al., 2018). Whilst these results were for all years combined, researchers found that academic workload was the biggest stressor for first years and issues with work-life balance for third years (Hill et al., 2018). Responses to the open-ended question (N = 852) also found academic workload (n = 333) to be the most commonly reported stressor (Hill et al., 2018). This was closely followed by pressure to perform (n = 306), with students reporting both internal pressure they place upon themselves and external pressure from others (e.g. professors, parents) (Hill et al., 2018). Other stressors found were structure, administration and faculty (n = 73), time constraints and lack of balance (n = 285), negative effects on health (n = 38), concerns about the future and career plans (n = 93), and financial concerns (n = 147) (Hill et al., 2018). Whilst the authors found that there was some overlap in stressors reported in fixed-choice and open-responses, the fact that the fixed responses were administered first and the open question at the end means that the fixed-reponse questions could have primed responses to the open question (leading to the overlap). However, it was still useful to have given medical students the option of an open-response because it allowed them to report stressors not available in the fixed-choice list.

1.2.3. Anxiety and depression

An extensive amount of research exists demonstrating prevalence of anxiety and depression in medical students. A systematic review of systematic reviews found that depression affected 25% of medical students generally (medical students from multiple countries combined) and 40.9% in Africa alone (Tam, Lo, & Pacheco, 2019) highlighting that levels of psychopathology can differ between cultures. These differences could also be due to differences in measurement. Baldassin, Alves, de Andrade, and Nogueira Martins (2008) found 38.2% of medical students in Brazil (N = 481) had depressive symptoms (measured using the Beck Depression Inventory (BDI)), with the highest depression scores found in years five and six (n = 154). Other years had similar sample sizes (first and second (n = 163), and fourth and fifth (n = 164)), so the difference in prevalence of depression between years is not due to significant differences in sample size, thus improving the reliability of the results. Another study in Dubai (N = 165) found 28.7% of medical students to have anxiety (measured using the Beck Anxiety Inventory (BAI)) and 28.6% depression (measured using BDI), with second-year medical students experiencing higher scores of anxiety and depression (Ahmed, Banu, Al-Fageer, & Al-Suwaidi, 2009). It was not clear in this study how many students were in each year, which makes it difficult to establish if the higher scores reported were due to significant differences in sample size between years. Thinking about the differences between the Baldassin et al. (2008) and Ahmed et al. (2009) studies in relation to the fact that they report different years as experiencing worse depression despite using the same measure, these differences could be related to differences in culture because they are conducted in different countries and/or because of the differences in sample size. Thiemann, Brimicombe, Benson, and Quince (2020) conducted a cross-sectional study with final year UK medical students (N = 446) investigating the timing of assessment of symptoms of depression and anxiety (i.e. whether medical students had examinations imminently (within 2-months of assessment (n = 164)) or not imminently (more than 2-months away from assessment or who had already taken them (n = 282)). It was found that medical students who had examinations imminently had significantly higher scores on depression and anxiety (as assessed by the Hospital Anxiety and Depression Scale (HADS)) than medical students who did not have examinations imminently (Thiemann et al., 2020). However, only final year students were included in this

analysis, so these results cannot be applied to other years. Further, it could be argued that examinations conducted in the final year of medical school may be more stressful than earlier years because there is more pressure as it is the final stage of the course. Despite these limitations, this study highlights that timing of assessment should be considered in studies measuring mental health difficulties in medical students, and could explain why differences are found in prevalence rates across studies.

Research has also identified comorbid anxiety and depression in medical students, with one study conducted in Ethiopia reporting 21.2% of medical students (N = 273) fitting into this category (Kebede, Anbessie, & Ayano, 2019). Kebede et al. (2019) also found 51.3% of medical students to have depression, 30.1% anxiety, and that first and second years, as well as those aged between 18 and 21 years, were more prone to depression (the HADS was used to measure anxiety and depression in this study). Generally, anxiety appears to be higher in this population than depression, but they are both at significant levels and above that of some reported rates in general populations (Tabalipa et al., 2015). It has been found that levels of anxiety and depression at entry to medical school are similar to the general population (Smith et al., 2007), suggesting medical school is a contributory factor to the development of these mental health difficulties. These studies were cross-sectional, so it is not clear whether anxiety and/or depression is present in the same medical students over the whole five years of medical school.

1.2.4. Risk factors for anxiety and depression in medical students

Whilst stress associated with attending medical school has been identified as a precursor to the development of anxiety and depression, studies have found other risk factors in medical students. These include being of female gender (Baldassin et al., 2008; Brenneisen Mayer et al., 2016; Chandavarkar, Azzam, & Mathews, 2007; Ediz et al., 2017; Fawzy & Hamed, 2017; Iqbal et al., 2015; Kebede et al., 2019; Kumar et al., 2019; Laidlaw, 2009; Moutinho et al., 2017; Tabalipa et al., 2015), not having a parent who studied medicine (Baldassin et al., 2008; Tabalipa et al., 2015), lower socio-economic status, not being satisfied with the course (Ediz et al., 2017), and lower perceived performance (Chandavarkar et al., 2007). Depression and anxiety have been found to be lower with increase in grades (Ediz et al., 2017), suggesting either poor academic performance is a risk factor for depression and anxiety, or that the presence of these mental health problems adversely impact on academic

performance. With regards to year of study, depression has been found to be more prevalent in the first year of study (Ediz et al., 2017), and anxiety and depression in the first and second year of study (Kebede et al., 2019). Another study found second years to have the highest rates of anxiety and depression (Ahmed et al., 2009). It appears therefore that the earlier years of medical school could be a particularly risky time for the development of mental health problems. This could be associated with the transition period of being a new student and adjusting to the demands of the course.

1.3. Online addiction

Before discussing online addiction research, it is important to clarify some definitions related to this concept. This section will begin with defining what is meant by online versus the Internet. It will then aim to clarify what is meant by online addiction and what it means in the context of this project.

Online is defined as:

> *'...the condition of being connected to a network of computers or other devices. The term is frequently used to describe someone who is currently connected to the Internet.'*
>
> (TechTarget, 2007)

The Internet is defined as:

> *'...having two major components: network protocols and hardware. The protocols, such as the TCP/IP suite, present sets of rules that devices must follow in order to complete tasks. Without this common collection of rules, machines would not be able to communicate.'*
>
> *'Hardware, the second major component of the Internet, includes everything from the computer or smartphone that is used to access the Internet to the cables that carry information from one device to another. Additional types of hardware include satellites, radios, cell phone towers, routers and servers.'*
>
> (TechTarget, 2019)

Based on the above definitions of online and the Internet, for the purposes of this study, online use relates to being connected to a computer (e.g. laptop or personal computer (PC)) or device (e.g. Smartphone, tablet) and actively accessing information (e.g. YouTube, Google searches, literature searches) or services (e.g. online banking or shopping, porn), or to communicate with others (e.g. Snapchat, Instagram, Twitter,

Facebook, email). In order to access this information online, an Internet connection is required (e.g. via router, Smartphone). In this report and throughout this project, the term online use and its variations (e.g. use of the online world), will be used to describe the state of actively being online (and by definition, being connected to the Internet).

1.3.1. What is meant by online/Internet addiction?

This section starts with a discussion about the controversy surrounding the conceptualisation of Internet addiction. It will then introduce definitions of Internet addiction, and end with a description of how Internet addiction will be operationalised in the current study.

1.3.1.1. The controversy surrounding the conceptualisation of Internet addiction

There has been a great deal of controversy surrounding the concept of Internet addiction related to its definition (what constitutes an Internet addiction), and whether it should be classified as a psychiatric disorder. Internet addiction is not included in the current Diagnositic and Statistical Manual of Mental Disorders - Fifth Edition (DSM-V) (diagnostic manual used in the UK and US), but has been recognised as a diagnosable condition in other countries such as China (Weintraub, Dunn, Yager, & Taintor, 2011). It has been suggested that some of the differences in diagnosing Internet addiction could be related to differences in culture (Griffiths, 2013; Griffiths, Kuss, Billieux, & Pontes, 2016). Countries in South East Asia for example, may have a more pathologising view of online behaviour, which could be linked to the importance of family and how online use takes time away from family activity (Griffiths, 2013; Griffiths et al., 2016). However, it is also possible that Internet addiction is more prevalent in South East Asia than the West. It has been suggested that in China for example, the boom in the number of people addicted to the Internet could be related to the pressure children and adolescents feel to meet the expectations of their parents (Phillips, 2017). Boot camps have even been set up in China for children and adolescents who have been identified as being Internet addicted (usually sent to the camps by their parents) (Phillips, 2017). Interventions in such camps can range from military-style discipline to electroconvulsive therapy to treat Internet addiction (Phillips, 2017), illustrating that some quite extreme measures are taken in an attempt to tackle this problem.

There is some evidence that Western Countries are also starting to take action to address online addictions. In the UK for example, a service has been set up by the National Health Service (NHS) to treat children and young adults with 'computer gaming addiction' (NHS England, 2019), and in the United States a hospital in Pennsylvania introduced a treatment program for adults with an Internet addiction (DeMarche, 2013). This suggests an increased recognition that Internet addiction is prevalent enough to warrant commissioning services to treat people identified as experiencing this psychological difficulty.

Griffiths et al. (2016) consider the lack of an international consensus of what Internet addiction actually is as one of the key criticisms of this concept. One of the issues surrounding this lack of consensus is a debate related to whether people are addicted *to* the Internet or *on* the Internet (Griffiths et al., 2016; Starcevic, 2013). Davis (2001) articulates this well in their model of pathological Internet use where a distinction is made between generalised pathological Internet use (refers to addiction *to* the Internet due to excessive use of the different areas of the Internet and thus more general use), and specific pathological Internet use (refers to addiction *on* the Internet because of the excessive use of specific areas of the Internet, such as gambling or pornography). With addictions *on* the Internet, it is suggested that engagement in such activities online is the result of pre-existing addictions (that can also be engaged in offline) and the Internet is used as a medium to engage in this activity (Davis, 2001). Generalised pathological Internet use on the other hand (addiction *to* the Internet) is considered more problematic because it would not exist if there were no Internet (Davis, 2001). However, in relation to excessive gaming online (addiction *on* the Internet), other researchers believe that this is more problematic than other online activities, and can result in severe consequences (Ko, Yen, Chen, Yeh, & Yen, 2009; Ko, Yen, Yen, Lin, & Yang, 2007; Petry, Rehbein, Ko, & O'Brien, 2015; van Rooij, Schoenmakers, van de Eijnden, & van de Mheen, 2010). There are some scholars (e.g. Aarseth et al., 2016) who have expressed concerns about formalising gaming disorder (e.g. as in the International Classification of Diseases-11 (ICD-11) as discussed in the next paragraph) because this can risk stigmatising many children and adolescents who enjoy gaming as part of a healthy lifestyle. They argue that this stigmatising approach to online gaming can result in difficulties in the parent-child relationship, and parents resorting to extreme measures (such as sending their children to boot camps as

described earlier) (Aarseth et al., 2016). Aarseth et al. (2016) also argue that including a diagnosis of 'Gaming Disorder' in the ICD-11, and including 'Internet Gaming Disorder' in Section III of the DSM-V as a 'Condition for Further Study' (American Psychiatric Association, 2013; Petry et al., 2015) will result in future research being conducted in a confirmatory fashion, rather than researchers taking an exploratory approach (thus reducing rather than expanding knowledge in this area).

Griffiths et al. (2016) argue that the reason the term 'Internet Gaming Disorder' was used in DSM-V rather than 'Internet addiction' was because gamers are not perceived as being addicted to the Internet, but instead using it as a medium to engage in gaming. The DSM-V advise five of the following nine criteria must be met within a year to be diagnosed with Internet Gaming Disorder; withdrawal symptoms, tolerance, being preoccupied or obsessed with gaming, loss of control over gaming, functional impairment, continuous overuse, loss of interest, deceiving, and escaping negative feelings (American Psychiatric Association, 2013; Jo et al., 2019). The DSM-V considers offline gaming to be included in the category of Internet Gaming Disorder (American Psychiatric Association, 2013; Petry et al., 2015). The ICD-11 have included 'Gaming Disorder' under the 'Disorders due to addictive behaviours' category (World Health Organization, 2021). Unlike the DSM-V, Gaming Disorder is classified as a formal disorder in the ICD-11 (World Health Organization, 2021). For diagnosis of Gaming Disorder, the following three characteristics must be met; impaired control over gaming, gaming being prioritised over other activities, and gaming continuing despite negative consequences. These characteristic behaviours must also result in marked distress or significant impairment in functioning, and be present for at least 12-months (can be shorter period if symptoms are particularly severe) (World Health Organization, 2021). Like the DSM-V, Gaming Disorder in the ICD-11 includes gaming both on and offline. This suggests that the American Psychiatric Association (APA) (publishers of the DSM) and the World Health Organization (WHO) (publishers of the ICD) are acknowledging that this is not an addiction specific to online use (i.e. that the Internet is used as a medium to engage in this activity). This made me wonder why the word Internet is included in the title of this condition for further study in the DSM-V, and why it is not referred to as Gaming Disorder as it is in the ICD-11. Petry et al. (2015) suggest the reason for this is that online gaming is engaged in more frequently, and is more problematic than gaming

generally, and so the primary focus is Internet gaming. Griffiths et al. (2016) argues that if the concept of Internet addiction relates to use of the Internet as a medium to fuel pre-existing addictions, then the concept is not viable. However, as Davis' (2001) model suggests, people can also be addicted to various Internet activities, so in this context, a more generic concept or diagnosis of Internet addiction would be an appropriate way of capturing this particular experience.

1.3.1.2. Developing a definition of Internet addiction

Whilst there has been a lack of agreement on the concept of Internet addiction and whether it is a diagnosable conditon, and the focus of the DSM-V and ICD-11 being on gaming disorders rather than Internet addiction more generally, some researchers have developed definitions of Internet addiction. Young (1998) for example, argues that the Diagnositic and Statistical Manual of Mental Disorders - Fourth Edition (DSM-IV) definition of Pathological Gambling is the closest definition to Internet addiction. As a result, Young (1998) describes Internet addiction as *'an impulse-control disorder which does not involve an intoxicant'* (p. 238). Young (1998) created the Internet Addiction Test (IAT), which is the first validated measure of Internet addiction. The IAT is a 20-item self-report questionnaire that measures mild, moderate and severe Internet addiction. The IAT is over twenty years old, and so the first version of this measure was developed before the mainstream use of social media or smartphones. This meant that none of the items included in this version of the measure made reference to social media platforms (e.g. question 7 read *'How often do you check your email before something else that you need to do?'*), which means that those checking social media (e.g. WhatsApp, Facebook) would not be captured potentially resulting in inaccurate measurement. There has been minor amendments made to the IAT, which include the use of social media (i.e. question 7 has been amended to *'How often do you check social media (e.g. Facebook, Messenger, WhatsApp, Snapchat, Viber), email online and/or on your phone before doing something else you need to do?'*) (see **Appendix A** for a copy of the most up-to-date version of the IAT). Most items on the IAT however, refer to the online world in a more generic way (e.g. *'How often do your grades or school work suffer because of the amount of time you spend online?'*, *'How often do you find yourself anticipating when you will go on-line again?'*, *'How often do you find that you stay on-line longer than you intended?'*), so can be applied to multiple online activities.

The IAT is the most frequently used measure of Internet addiction, and the most validated (Laconi, Rodgers, & Chabrol, 2014). Based on the items included in the IAT (and Young's (1998) definition of Internet addiction), it appears that the IAT is predominantly a measure of addiction *to* the Internet.

As well as providing a similar definition of Internet addiction as Young (1998), Tikhonov and Bogoslovskii (2015) add that Internet addiction:

> *'…is characterized by a person's obsessive desire to access the Internet while being off-line, and the inability to get off-line while one is on-line'.* (p.97).

Other researchers have included the adverse effects of Internet addiction stating it can result in:

> *'…the inability of individuals to control their Internet use, resulting in marked distress and/or functional impairment in daily life'* (Pies, 2009, p.32).

The IAT also appears to capture experiences that fit into these definitions (as illustrated by the example questions presented above and the other questions in the measure itself). Whilst the DSM-V and ICD-11 only include gaming disorder (rather than Internet addiction more generally), it appears that the criteria used to diagnose Internet Gaming Disorder and Gaming Disorder (in the DSM-V and ICD-11 respectively) share similar characteristics to the definitions provided above by Young (1998), Tikhonov and Bogoslovskii (2015), and Pies (2009) in their definitions of Internet addition (e.g. reference to lack of control of online use, marked distress and/or functional impairment). Whilst the IAT appears to be a measure of addiction *to* the Internet, the fact that it refers to all Internet activity means that it will also capture people who are addicted to gaming online. However, it will not be able to specify what the nature of the Internet addiction is (i.e. that it is a gaming addiction or addiction *on* the Internet). This limitation does not only apply to the IAT. In their review of Internet addiction measures, Laconi et al. (2014) recommended that all Internet addiction assessment tools should aim to obtain information about the type of online activity engaged in, so that the nature of the addiction can be identified. This ability for the IAT to capture the experience of Internet addiction as defined by different researchers as well as gaming disorders classified by the APA and WHO, could also be why it is still one of the most commonly used measures in research conducted in this area despite its age.

These definitions highlight that Internet addiction is more than just spending a lot of time online. This point is stressed by Pontes, Kuss, and Griffiths (2015) who argue that whilst Internet addiction *'implies excessive Internet use patterns'* (p.14), excessive use in and of itself does not mean someone is addicted to the Internet. Pontes et al. (2015) state that distinguishing between excessive Internet use and Internet addiction is *'crucial given the overlapping boundaries between the two behaviors'* (p.14). The context of excessive Internet use has also been highlighted as an important consideration (Griffiths, 2010; Pontes et al., 2015). In summary, in addition to excessive Internet use, Internet addiction is characterised by compulsion to be online, and repetitive behaviours related to online use. Further, Internet addiction can have adverse effects for the individual (e.g. reduced social contact, being detached from reality, neglect of personal or others needs) (Tikhonov & Bogoslovskii, 2015).

1.3.1.3. Operationalisation of Internet addiction for this project

Whilst there is controversy surrounding the concept of Internet addiction, it is still a heavily researched area, and as such it is helpful to make clear how Internet addiction is conceptualised in any study conducted. Based on the Internet addiction definitions provided in this section (Pies, 2009; Tikhonov & Bogoslovskii, 2015; Young, 1998), the areas covered by the IAT, and the overlap of these definitions with DSM-V and ICD-11 gaming disorder crieria, the definition of Internet addiction for the current study incorporates the amalgamation of these dominant characteristics. The main difference is that it will refer to Internet addiction, and therefore more broadly captures various online activities, rather than only focussing on online gaming (as in the DSM-V and ICD-11). As such, the definition of Internet addiction for the current study broadly refers to; impaired control of and/or obsession or pre-occupation with one's use of the online world to such an extent that use of the Internet is prioritised over other activities, resulting in marked distress and/or functional impairment (e.g. occupational, social difficulties). This definition will apply regardless of whether or not the country the research has been conducted in recognises it as a diagnosable condition. This is because researchers in this area appear to be using the same characteristics and/or tools (predominantly the IAT) to measure this phenomenon.

In light of the aforementioned definitions of online and Internet, the terms online addiction and Internet addiction refer to the same thing in the context of this project (because you are using the Internet if you are online). Whilst both terms will be used throughout this thesis, Internet addiction and its variations (problematic Internet use and pathological Internet use) will primarily be used because these terms appear to be used most frequently in the research literature, and in the context of discussing the behaviours that characterise Internet addiction. I will now go onto discuss Internet addiction research more generally. I then go onto discuss Internet addiction in University students, and then focus in on medical students specifically.

1.3.2. Internet addiction and coexisting psychopathology

Block (2008) reported that 86% of people identified as having an Internet addiction also have a psychiatric diagnosis as defined by the DSM-IV. In a study exploring the differences in comorbidities in male adolescents (mean age 15 years) with and without an Internet addiction, just over 80% of those with an Internet addiction had what the authors described as a comorbid psychiatric diagnosis (as defined by the DSM-IV) (Lee et al., 2014). The most common comorbid diagnosis was depressive disorder (38.7%) followed by attention-deficit hyperactivity disorder (35.5%), mood disorders other than depression (12.9%), anxiety disorder (8.1%), substance use disorder (4.8%), impulse control disorder (4.8%) and other (14.5%) (Lee et al., 2014). Total comorbidity in this study was just over 80%. This study only included male adolescents, so it can not be assumed that these comorbidities also occur in females or older adolescents. Further, comorbities in those without an Internet addiction was not assessed in this study, so it is unclear if these comorbid disorders are specific to those identified as having an Internet addiction or if it is due to other factors (e.g. socioeconomic status, trauma history).

1.3.3. Internet addiction in undergraduate students

Kuss, Griffiths, and Binder (2013) found 3.2% of 2,257 university students (UK sample) to be experiencing Internet addiction (measured using the Assessment for Computer and Internet Addiction-Screener (AICA-S)). Another UK study (N = 371) conducted by Niemz, Griffiths, and Banyard (2005) found 18.3% to be experiencing pathological Internet use (measured using the Pathological Internet Use scale (PIU)). In terms of reporting specific levels of Internet addiction, Christakis,

Moreno, Jelenchick, Myaing, and Zhou (2011) found that 4% of a sample of 307 university students (US sample) had moderate Internet additiction (measured using the IAT). Another study (N = 2,108) found that 81.8% of students (US sample) had mild Internet addiction (also measured using the IAT) and 5.3% moderate to severe (Derbyshire et al., 2013). Different measures of Internet addiction were used in these studies, which makes it more difficult to compare the results across studies. This could also account for differences in prevelence rates of Internet addiction across these studies. There were some significant differences in sample size, which could contribute to the differences in rates of Internet addiction found. All these quantitative studies were cross-sectional by design, so it is not known if levels of problematic Internet use were maintained over time. However, these studies do provide an indication of the levels of Internet addiction present in university students.

1.3.4. Associations and adverse effects of Internet addiction in undergraduate students

Internet addiction has been found to be associated with other factors in university students. Cardak (2013) found that the higher the level of Internet addiction in university students (N = 479), the lower their psychological wellbeing. Another study (N = 371) found that males were more likely to be experiencing pathological Internet use than females (28.7% and 9.5% respectively) (Niemz et al., 2005). Derbyshire et al. (2013) found that the presence of Internet addiction in university students (N = 2,108) was associated with lower grade point average, less exercise, higher scores on a measure of mental health, and higher perceived stress. Whilst this research gives us an idea of some of the problems that can be associated with Internet addiction, it does not tell us much about why these issues are present or the causal direction in these relationships. This highlights the limitation of quantitative research because whilst this method can be useful for identifying factors associated with Internet addiction, and recruiting large numbers of participants into studies allowing for the generalisation of results, the type of information obtained via quantitative methods lacks depth, limiting understanding of phenomena (Braun & Clarke, 2013). This point was echoed by Kardefelt-Winther (2014) who states in their comments about quantitative research exploring *'psychological vulnerabilities and internet addiction'* (p.351):

> *'...because most factors were found to be significant predictors it has not been possible to make any claims about unique risk factors which has made it difficult to isolate the causes behind internet addiction.'* (p.352)

Li, O'Brien, Snyder, and Howard (2015) conducted a qualitative study using focus groups to investigate the key issues university students (undergraduates (81.5%) as well as graduates (18.5%) were included in this study) see as triggering their problematic Internet use, history of problematic Internet use, interpersonal and situational triggers, and several other areas. The authors also aimed to contextualise Internet addiction in this group as they argue quantitative studies fail to do this. Three overarching themes emerged from this study: factors triggering Internet use (mood and feelings, boredom and stress and escapism); Internet-related activities (social media, school work, other Internet activities); and consequences of Internet overuse (physical and mental health outcomes, psychosocial functioning, work productivity) (Li et al., 2015). This study builds on quantitative research as it adds more depth to the investigation of Internet addiction by identifying different internal and external factors that contribute to problematic Internet use, the activities associated with Internet use, and the consequences of problematic Internet use. The study could have benefited from having less pre-conceived ideas about what they wanted to get out of the study to allow the emergence of individual experience of Internet addiction to occur, and perhaps conducting individual interviews to allow for a more in-depth investigation. Although most students were undergraduates, it may have been more helpful to include just undergraduates or just graduates (or as a minimum describe any differences between them in the results).

1.3.5. Internet addiction in medical students

Internet addiction has also been found to be present in medical students. Chaudhari, Menon, Saldanha, Tewari, and Bhattacharya (2015) found 58.87% of all first, second and third year medical students (Indian sample (N = 282)) had Internet addiction (51.42% mild and 7.45% moderate, no severe Internet addiction was found in any students). Javaeed et al. (2019) found 52.4% of all first to fifth year medical students (Pakistani sample (N = 210)) to be moderately to extremely severely addicted to the Internet. Another study found 27% of medical students (Indian sample (N = 1,763)) had mild Internet addiction, 10.4% moderate and 0.8% severe (Anand et al., 2018), and Tsimtsiou et al. (2015) found 24.5% of all medical students in years

one to six (Greek sample (N = 585)) to have mild Internet addiction, 5.4% moderate and 0.2% severe. All these studies used the same measure of Internet addiction (Young's Internet Addiction Scale (IAT: Young, 1998)), which allows the results between studies to be compared. Whilst the sample sizes across all these studies were adequate, there was a variation in sample sizes, with larger sample sizes showing lower prevalence rates of Internet addiction. This difference in sample size, in addition to the fact that these studies were conducted in various different countries around the world, could contribute to the difference in levels of Internet addiction when comparing research conducted with medical students. Zhang, Lim, Lee, and Ho (2018) conducted a meta-analysis to establish the pooled prevalence of Internet addiction in medical students (pooled sample size was 3,651 across 10 studies). The pooled prevalence of Internet addiction across studies was found to be 30.1% (95% confidence interval 28.5-31.8%), and around five times that of the general population (Zhang et al., 2018). Zhang et al. (2018) reported significant heterogeneity ($p < 0.0001$) in the prevalence of Internet addiction, and suggested this could be because of the different measures used (higher rate of prevalence in studies using the IAT). However, only one study did not use the IAT (one study used the Chen Internet Addiction Scale (N = 383) and the remaining nine studies the IAT). The studies included in this meta-analysis were from six different countries (Iran (n = 3), India (n = 2), Chile (n = 1), Greece (n = 1), Malaysia (n = 2) and Thailand (n = 1)), so it is possible the difference in prevalence rates is related to the fact that included studies were completed with people from different countries and cultures (Zhang et al., 2018).

Shehata and Abdeldaim (2021) conducted a study (Egyptian sample) with fourth year medical students (Faculty of Medicine - N = 373) and non-medical students (Faculty of Science – N = 373) during the Covid-19 pandemic. They found that 51.7% of medical students have severe Internet addiction compared to 11.3% of non-medical students. These results suggest that Internet addiction was more severe in medical students during the pandemic than pre-pandemic (comparing these results to pre-pandemic studies discussed earlier). However, this study only included fourth year medical students, so it is not clear what levels of Internet addiction were across all years, and because of this the results cannot be compared to studies conducted pre-pandemic.

Despite the differences in rates of Internet addiction in medical students across studies, it is clear that Internet addiction is prevalent in medical students. Further, comparing the results to non-medical students, Internet addiction appears to be more prevalent in medical students.

1.3.6. Associations and adverse effects of Internet addiction in medical students

With regards to associations with other factors, a study (N = 210) found a mild positive association between Internet addiction and depression and stress, but no association between Internet addiction and anxiety (Javaeed et al., 2019). Anand et al. (2018) found that males had higher rates of Internet addiction (this was also the case for non-medical students (Niemz et al., 2005)) as well as those in rented accommodation, in psychological distress, and who accessed the Internet several times a day. Chaudhari et al. (2015) also found living in rented accommodation and spending more time on the Internet to be associated with Internet addiction, but also found younger age of Internet use, using a mobile phone for Internet use, higher spending on the Internet, social networking online, watching videos and sexual content online to be significantly related to Internet addiction. Boonvisudhi and Kuladee (2017) in their study with 705 medical students in Thailand, found *'possible Internet addiction'* to be associated with depression and academic problems. Javaeed, Jeelani, Gulab, and Ghauri (2020) in their study in Pakinstan, also found Internet addiction to be associated with poorer acdemic performance (N = 316).

A study in Iran (N = 174) investigating the quality of life (QoL) in medical students with Internet addiction found that QoL and grade point average to be lower in medical students with Internet addiction (Fatehi, Monajemi, Sadeghi, Mojtahedzadeh, & Mirzazadeh, 2016). Lower grade point average has also been found to be lower in non-medical students with Internet addiction (Derbyshire et al., 2013).

There are a number of negative associations with Internet addiction in medical students, some of which have also been found in non-medical students. It is possible that there are some negative associations unique to medical students. It is not possible determine this from quantitative research because this usually involves using specific measures, which means that results are limited by the measures chosen by researchers.

All the studies found on Internet addiction in medical students have been quantitative, so are subject to the same limitations mentioned earlier when reporting Internet addiction in undergraduate students more generally (i.e. lack of depth and undertsanding of factors contributing to Internet addiction) . In order to try and better understand some of the factors that can drive Internet addiction, the next section discusses three psychological theories of problematic Internet use.

1.4. Psychological theories of problematic Internet use

There are few psychological theories of Internet addiction in the literature. There are some studies that examine whether more generic psychological theories (not specific to Internet addiction) can explain Internet addiction, and aim to test these theories (usually using quantitative methods). Tan (2019) for example, conducted a study examining personal susceptibility and social support in Internet addiction applying Adler's theory of individual psychology. Another study explored academic stress and Internet addiction using general strain theory framework (Jun & Choi, 2015). This section examines two psychological theories of Internet addiction: the cognitive-behavioural model of pathological Internet use; and the theory of compensatory Internet use, and self-determination theory applied to Internet addiction. The two psychological theories of Internet addiction are included because these were two of the very few theories of Internet addiction in the literature, and both of these theories are from different perspectives (one more pathological than the other), thus adding more balance and understanding the factors contributing to Internet addiction. Whilst self-determination theory was not a theory of Internet addition specifically, it has been applied to a number of studies related to Internet addiction in the literature (e.g. Mills & Allen, 2020; Park & Kim, 2011; Wong, Yuen, & Li, 2015; Zhao, Lu, Wang, & Huang, 2011).

1.4.1. Cognitive-Behavioural Model of Pathological Internet Use

The diathesis-stress model proposes that:

> *'…abnormal behavior is the result of a predisposed vulnerability (diathesis) and a life event (stress).'* (Davis, 2001, p.190).

Table 1 below shows details of the different aspects of the Cognitive-Behavioural Model of Pathological Internet Use. In this model the diathesis is *'existing psychopathology'* (Davis, 2001, p.190), which has been found to be present in individuals with problematic Internet use (as described in the research mentioned earlier (Block 2008; Lee et al., 2014)). Davis (2001) argues that the presence of existing psychopathology does not necessarily cause the symptoms of pathological Internet use, but instead proposes that it makes individuals more vulnerable to pathological Internet use. The stress element in this model is the introduction to the Internet or new technology found online. This could include exploring when the Internet was first accessed by individuals as well as new technology found online. This model focuses on the *'maladaptive cognitions'* related to pathological Internet use (Davis, 2001, p.187 and 191).

This model provides possible explanations for the associations found between Internet addiction and psychopathology (Block 2008; Derbyshire et al., 2013; Javaeed et al., 2019; Lee et al., 2014). It does this by explaining how existing psychopathology, new Internet experiences and situational cues can contribute to maladaptive cognitions (e.g. *'I feel worthless offline, but I don't online'*). The model then goes on to explain how these unhelpful cognitions contribute to the development of both specific and generalised pathological Internet use and the behavioural symptoms that ensue. The model appears to be very much focused on the individual and their internal cognitions (about the self and the world) and processes (e.g. rumination). As discussed earlier in this report, research conducted in this area has found particular external or environmental factors to be associated with Internet addiction in medical students (e.g. living in rented accommodation (Anand et al., 2018; Chaudhari et al., 2015) and younger age of first Internet use (Chaudhari et al., 2015)). What is lacking in this model is adequate consideration of the effects of external factors contributing to the process of developing pathological Internet use (e.g. environmental, culture, family, educational or occupational). Further, the very pathological nature of this model could be viewed as a limitation because other possible non-pathological explanations for problematic Internet use are not considered in the model itself. This makes the model incomplete in helping us understand Internet addiction. Due to this, on its own, the model is not sufficient in providing a more holistic understanding of the reasons for Internet addiction in medical students.

However, it has been included as a theory of Internet addiction because it is a very comprehensive model that considers multiple factors, and is considered an influential model in Internet addiction research (e.g. Brand, Young, & Laier, 2014; Caplan, 2002; Griffiths et al., 2016). Whilst it may not include all possible factors, it can still be used to explain some reasons for Internet addiction in medical students.

Table 1. Cognitive-Behavioural Model of Pathological Internet Use (Descriptions)

Model element	Description
Internet	Introduction to the Internet or new technology found online.
Situational cues (reinforcement)	Where operant conditioning occurs. Reinforcement individual receives from the online event. Positive responses to a new online activity led the individual to continue with the online activity more frequently to achieve the same response as the one associated with the initial use. Stimuli associated with the new online activity (e.g. sound of computer/device connecting, odour of office/bedroom activity is engaged in) can lead to a conditioned response.
Psychopathology	Existing mental health problems present in the individual (e.g. anxiety, depression, substance use).
Maladaptive cognitions	Unhelpful thoughts or beliefs, which contribute to the maintenance of PIU. The model argues there are 2 main types: 'thoughts about the self' (e.g. *'I am worthless offline, but online I am someone'*) and *'thoughts about the world'* (e.g. *'The Internet is the only place I am respected'* or *'The Internet is my only friend'*). Thoughts are described as *'all or nothing thinking'*. Thoughts about the self are argued to be ruminative in nature leading to increased recall of reinforced memories of the Internet, prolonging and increasing the severity of PIU. The Internet allows individuals to seek more positive responses from other people in a way that is non-threatening. (p.191-192).
Social Isolation and/or lack of social support	Related to the social context of the individual and argued to be related to General PIU (see below).
Specific Pathological Internet Use (SPIU)	Involves abuse and overuse of the specific Internet areas (e.g. pornography, gambling). Argued to be a result of pre-existing psychopathology (e.g. already addicted to porn or gambling offline), which transitions to engaging in the activity online.

	Associated with the social context of the individual (e.g. lack of social support from friends or family and/or feeling socially isolated). Involves spending *'abnormal amounts of time'* online *'wasting time'* and engaging in activity with *'no directive purpose'* (e.g. repeatedly checking emails/social media, spending a lot of time in chat rooms) (p.192).
General Pathological Internet Use (GPIU)	Procrastination said to play a significant role in the development of generalised PIU as individuals can use the Internet to put off tasks/responsibilities, which can result in *'significant problems in daily functioning'* (p.192). Considered more problematic than specific PIU because would not exist if there were no Internet (although it is recognised that existing psychopathology would be present as well as maladaptive cognitions and social isolation, but that the Internet would not exist to allow them this contact with the outside world to express their *'angst'* (p.192)).
Behavioural Symptoms of PIU	Similar to symptoms described by Young (1996) except the focus is on cognitive symptoms. Symptoms defined as: *'...obsessive thoughts about the Internet, diminished impulse control, inability to cease Internet usage, and importantly, feeling that the Internet is an individual's only friend'* as well as: *'...thinking about the Internet while offline, anticipating future time online, and spending large amounts of money on Internet time and other such expenses'* (p.193). Less time is spent doing other non-Internet related activities, and such activities are experienced as less enjoyable. This can lead to social isolation and withdrawal as well as individuals lying to friends and family about how much time they spend online. Individuals may understand what they are doing is socially undesirable, but are not able to stop.

Table created using descriptions of the model provided in research article by Davis (2001)

1.4.2. Self-determination theory

Self-determination theory (SDT) is a broad theory of personality development, motivation and wellness (Ryan, Soenens, & Vansteenkiste, 2019). SDT consists of six mini-theories (Ryan & Deci, 2019). Basic Psychological Needs Theory (BPNT) is one such mini theory, which posits that human beings have three primary psychological needs required to achieve optimal functioning and wellbeing; 1) Autonomy, 2) Competence and 3) Relatedness (Ryan & Deci, 2000, 2019). Autonomy relates to the feeling of having choice and psychological freedom; Competency relates to the feeling of mastery and being good at a task or skill; and

Relatedness concerns the feeling of belonging and connectedness to others (Kusurkar & Ten Cate, 2013; Ryan & Deci, 2000).

It has been suggested that Internet addiction is the result of unmet needs in one's life and problematic Internet use is a way of coping with everyday problems (Song, Larose, Eastin, & Lin, 2004; Wong et al., 2015; Young, 1998). Due to this, BPNT may be relevant and help us understand Internet addiction in medical students, which is why it is included here as a psychological theory of Internet addiction.

Davis' (2001) cognitive model of pathological Internet use described above implicates psychopathology to be a contributory factor to pathological Internet use. Wong et al. (2015) takes this further by suggesting that the development of psychopathology (referred to as *'psychological distress'* by Wong et al. (2015) in their study) is the result of unmet basic psychological needs. In their study with undergraduate students in Hong Kong, Wong et al. (2015) tested a hypothesis that psychological distress would mediate the relationship between unmet basic psychological needs and problematic Internet use, and found that this hypothesed model had a *'moderately good fit'* and was the best fit when compared to other models tested.

As discussed earlier in this report, medical students have been identified as a population who experience mental health problems (psychological distress). Due to this, it is possible that BPNT and the model proposed by Wong et al. (2015) could help us understand Internet addiction in medical students. Medical students could have unmet needs prior to and/or after attending medical school. Lack of social support (relatedness need not being met) for example, could contribute to the development of psychopathology (e.g. anxiety, depression). To cope with distressing thoughts or feelings, medical students could turn to the online world to satisfy this need (e.g. use of social media) resulting in problematic Internet use (e.g. general pathological Internet use as described in Davis' (2001) cognitive model) . Whilst Wong et al.'s (2015) model gives us a framework that can help us understand the development of Internet addiction, it is not specific to students at medical school. It also does not tell us what the unmet needs of medical students are, what it is about their existing psychological difficulties that results in distress, and what aspects of this distress results in problematic Internet use. A qualitative study could provide this additional knowledge.

1.4.3. Theory of compensatory Internet use

Kardefelt-Winther (2014) suggests a model of compensatory Internet use where Internet addiction is viewed as a coping strategy (compensation) rather than a compulsion. He suggests that individuals use the online world to alleviate negative feelings caused by situations in their life (e.g. someone with little social contact with others, may turn to the online world to socialise and feel more connected to others) (Kardefelt-Winther, 2014). Kardefelt-Winther (2014) suggests that compensatory behaviour can have positive consequences (in the example above, the person will be able to connect with others) and negative consequences (the person may not engage with people offline and may become dependent on the online world). The core idea behind the theory of compensatory Internet use is that:

> *'...when motivations are preceded by psychosocial problems, the risk for negative outcomes may be higher.'* (Kardefelt-Winther, 2014, p.353).

Whilst there is some overlap with the Cognitive-Behavioural Model of Pathological Internet Use (Davis, 2001) in that the online world is viewed as a means to connect with others, in contrast to Davis' (2001) model, Kardefelt-Winther (2014) argues that this theory moves away from viewing Internet addiction as a pathological problem related to compulsive behaviour. Instead, Kardefelt-Winther (2014) states that using the online world in this way:

> *'...is an understandable and practical way to acquire social stimulation when there is a lack of it...'* (p.352)

Further, Kardefelt-Winther (2014) propose that online use is as a result of some unmet needs, which makes it similar to BPNT in this respect (although there is still a pathological element in the study conducted by Wong et al. (2015)). Kardefelt-Winther (2014) state these unmet needs could be in various areas (e.g. socially motivated, achievement oriented, need to dominate), but could also be in response to other stressful life situations. This theory also acknowledges how ubiquitous the Internet is in society and how it is a big part of younger generation's world (e.g. for entertainment and communication), and suggests being mindful that what is being observed may not be pathological Internet use, but instead just *'everyday life'* (Kardefelt-Winther, 2014, p.353).

Whilst this theory does not explicitly discuss problematic Internet use in the context of medical student experiences, it is possible this theory could explain medical student's use of the online world as it considers both internal and external experiences. For example, medical students could use the online world to connect with friends and family after moving away to medical school, to achieve at medical school or a response to stress (e.g. demands of medical school).

I will return to these theories in the discussion (Chapter four) where I discuss to what extent they can explain the results of this study. What follows next are the aims and research question for the current study.

1.5. Aims and research questions

Given the problems associated with Internet addiction, the presence of this psychological difficulty could have advserse effects on medical students. Due to this, it is important to explore Internet addiction in-depth in the medical student population. As well as there being no studies found on Internet addiction in UK medical students, no qualitative studies have been found. The qualitative study conducted with non-medical students referenced earlier (Li et al., 2015), allowed for additional information about problematic Internet use to be elicited. It was felt that it would be beneficial to conduct a qualitative study with medical students to explore their Internet use in more depth, ensuring that the limitations of Li et al's (2015) study are addressed (i.e. conduct individual semi-structured interviews to elicit medical student's experience of the online world avoiding the use of very specific pre-defined ideas influencing the questionning in the interview). This study therefore plans to address this gap in research by exploring how UK medical students make sense of their online use in the context of their experiences. This will be done qualitatively using Interpretative Phenomenological Analysis (IPA). IPA was chosen because it allows for in-depth exploration of individual experience, which is something that previous quantitative research in this area has failed to do. More detailed information about this approach is covered in the next chapter (method). The primary research question for this project is:

How do students at medical school make sense of their use of the online world?

I will now go onto describe and provide a justification for the methodology chosen for the current study.

Method

This chapter provides a rationale for the methodology chosen for the current study. It begins by explaining the different ontological and epistemological positions in research, including my own position in relation to these concepts. Next, details of study design and procedures (recruitment and sampling methods) are provided as well as the analysis conducted. It ends with a reflexive statement, which provides information about how my personal and professional experiences could influence the results of the current study.

2.1. Ontology and epistemology: definitions and my position

Ontology refers to theories or beliefs about the nature of reality, and epistemology refers to theories or belief about knowledge (Braun & Clarke, 2013). Different ontological positions exist. Realism refers to the belief that there is only one truth that can be discovered through research, and is more aligned with quantitative research methods (Braun & Clarke, 2013). In contrast, relativism refers to the belief that there is no one truth, but instead multiple realities, and is aligned with qualitative research (Braun & Clarke, 2013). It is based on the idea that reality is constructed over time and different contexts, so is susceptible to change (Braun & Clarke, 2013). A critical realism position falls somewhere in-between realism and relativism, and often underpins qualitative research (Braun & Clarke, 2013). This position posits that because of the social influence of knowledge, we can only partially access it (Braun & Clarke, 2013). The idea behind this position is that we have to acknowledge that some truth exists because otherwise what would be the point in doing research to help increase knowledge and influence change (Braun & Clarke, 2013).

Braun and Clarke (2013) state that the key concern of epistemology is what constitutes *'legitimate 'knowledge''* (p.28). Three epistemological positions exist in relation to this. Positivism refers to the assumption that there is a simple relationship between reality and our knowledge of the world, and knowledge is gained from observations and objective data collection (Braun & Clarke, 2013). Positivists do not believe that researchers have any influence on the truth (Al-Saadi, 2014). Constructionism on the other hand, perceives knowledge as being constructed through discourses and the context and systems we live in (knowledge is socially constructed)

(Braun & Clarke, 2013). In the constructionist paradigm, no one truth exists (multiple *'knowledges'* (p.30) exist) because our discourses are said to change as well as knowledge (Braun & Clarke, 2013). Contextualism sits between positivism and constructionism. Like constructionism, contextualism posits there is not one single truth, but instead knowledge arises from contexts and is impacted by researcher's perspectives (so is not fixed) (Braun & Clarke, 2013; Tebes, 2005). Whilst the contextualist position does not believe there is one single truth, like positivism, it is interested in understanding reality. The belief is that there are different ways to get to the truth (Braun & Clarke, 2013; Tebes, 2005) and knowledge will be true in certain contexts (Braun & Clarke, 2013).

With regards to my position in conducting the current study, I will be approaching it from a critical relativist ontological position, and a contextualist epistemological position. This is because I believe that reality can change dependent on social context (there can be more than one reality), but that there is some truth out there, even though at times truths can change dependent on the context. I feel that there are different ways of accessing knowledge, and that the researcher's background and the way they view the world can have an impact on the knowledge gained. My position is reflected in the research method I have chosen to conduct this study, as well as the reflections on my impact on this research throughout this thesis (e.g. my reflexive statement at the end of this chapter).

2.2. Design

2.2.1. Quantitative versus qualitative research: A brief overview

Quantitative research has its roots in a deductive approach to scientific discovery as it usually involves collecting numeric data with the aim of testing hypotheses (e.g. related to relationships between variables or identifying factors that predict an outcome), and analysis is conducted using statistical techniques (Braun & Clarke, 2013). Data is normally collected from a large number of participants representative of a given population allowing results to be generalised. Typically, however, the type of data collected will lack depth and complex detail (Braun & Clarke, 2013).

Qualitative research has its roots in an inductive approach to scientific discovery, where observations of particular phenomena are used to derive general statements (results). Sometimes these results can later be used to create testable hypotheses analysed using quantitative methods. Qualitative research uses words as data in a particular context with the aim of gaining more in-depth understanding. This means that richer data is collected using qualitative methods than would be obtained via quantitative research (Braun & Clarke, 2013). Qualitative data is collected in smaller sample sizes than quantitative studies giving them a narrower focus, which allows for more detailed and complex data to be obtained and analysed (Braun & Clarke, 2013).

2.2.2. Why has a qualitative method been chosen for this project?

Most of the research conducted in the area of online addiction in medical students is quantitative (e.g. Anand et al., 2018; Chaudhari et al., 2015; Javaeed et al., 2019), which has provided knowledge of prevalence rates, risk factors and psychopathology for Internet addiction (Anand et al., 2018; Boonvisudhi & Kuladee, 2017; Chaudhari et al., 2015; Javaeed et al., 2020; Javaeed et al., 2019). However, medical student's experience of their use of the online world has not been explored in-depth using qualitative methods. Due to this, a qualitative method was used for this project. This section will go on to provide brief descriptions of three different qualitative methods that could potentially be used for this project. I will then go onto explain why IPA was chosen as the qualitative method .

2.2.3. Qualitative methods considered for this project

2.2.3.1. Grounded theory

Grounded theory is an inductive qualitative method, which means that theories and hypotheses are developed from the data collected (Engward, 2013) as opposed to a deductive approach which is theory driven. The aim of grounded theory is to understand *'social phenomena'* that is not *'pre-formed or pre-theoretically developed'* (Engward, 2013, p.38). Grounded theory is therefore best suited for research where there is minimal literature or pre-existing theory (Engward, 2013). A continuous and repetitive process of gathering and analysing data is involved in developing a theory

(Richardson, 1996). This qualitative method was not chosen for this project because whilst there is little qualitative research in this area, there is a lot of existing quantitative literature on Internet addiction in medical students as well as some theories of Internet addiction.

2.2.3.2. Thematic analysis

Thematic analysis is a more flexible qualitative method than grounded theory in that it can be inductive or deductive, i.e. it can be used in a bottom up, inductive fashion, with themes emerging from the data, or it can be used top down, deductively, looking to confirm presence of theoretically predicted themes in a dataset (Braun & Clarke, 2006). Braun and Clarke (2006) argue that thematic analysis can be dismissed as a poorly defined method due to the number of different ways it can be used, but that essentially it is:

> *'…a method for identifying, analysing and reporting patterns (themes) within data. It minimally organizes and describes your data set in (rich) detail.'* (p.79).

Braun and Clarke (2006) warned that due to the flexibility of thematic analysis (that there is not a singular structure or process), researchers should be cautious of passively discovering themes without reporting how they found them. Although the flexibility of thematic analysis could make it a potentially useful method for this study, a qualitative method that explores medical student's experiences in a more in-depth way would be better suited to this project.

2.2.3.3. Interpretative Phenomenological Analysis (IPA)

IPA is an inductive qualitative research method used to explore how people make sense of important life experiences (Reid, Flowers, & Larkin, 2005; J. A. Smith, Flowers, & Larkin, 2009). IPA is underpinned by three theoretical perspectives: phenomenology which is the philosophical study of experience; hermeneutics, the theory of interpretation; and idiography, which refers to the in-depth exploration of specific people's perspectives in a particular context (Smith et al., 2009). The aim of IPA is to explore human experience in a way that (as far as possible) allows one's experience to be expressed without the influence of pre-existing ideas (phenomenological aspect), and for the researcher to try and make sense of the participants making sense of their experiences (hermeneutical aspect) (Smith et al.,

2009). The hermeneutic circle is part of the hermeneutic aspect of IPA. It refers to the idea that understanding individual experience cannot be gained without considering the relationship between the part and the whole (e.g. understanding a single word (the part) can only be done when reading the full sentence the word is within (the whole)) (Smith et al., 2009).

IPA is similar to grounded theory in that researchers should avoid having pre-existing categories or theories driving the data collection process aimed at eliciting information to answer the primary research question. However, unlike grounded theory, researchers can also aim to answer secondary questions that can be related to existing theories and to the primary research question (Smith et al., 2009). If researchers decide to do this, they need to ensure that when collecting data the questions are as open as possible without the influence of any theories or assumptions that could be relevant. This is to avoid being too leading and losing the rich data obtained from exploring individual lived experience (i.e. theories should be held in mind, but not used to drive the questioning used in semi-structured interviews for example). In short, such secondary research questions should only be answered at the interpretative stage (Smith et al. 2009).

As collecting in-depth data about individual experience is the goal of IPA research, Smith et al. (2009) recommended in-depth semi-structured interviews or diaries are used for collecting data in IPA studies because these methods allow for the exploration of individual's thoughts, feelings, and narratives about the area of interest.

Whilst IPA has its benefits, there have been some criticisms of the method. Willig (2013) argues that language cannot be used to describe experience because *'language constructs, rather than describes, reality'* (p. 281-282). Due to this, they posit that it is *'impossible'* (p.282) to access an individual's direct experience. The aim of IPA however, is for the researcher to make sense of how participants make sense of their own experience (Smith et al., 2009). From this perspective, Smith et al. (2009) acknowledge that individual experience is in effect the researcher's interpretation of participant accounts, rather than reality. This is emphasised further when they state:

> *'…there is no such thing as a 'perfect' data collection event, and no version of events which is the 'the truth'.'* (Smith et al., 2009, p.55).

Another criticism of IPA is that whilst it aims to understand the participant's experience, it does not explain why experiences occur (e.g. what conditions contribute to participant's experience) (Willig, 2013). However, as mentioned earlier, IPA uses hermeneutics, which involves interpreting data as part of the whole. This means that the wider context of individual experience will be considered during analysis. Further, the use of idiography means that participant's experiences are situated in particular contexts (Smith et al., 2009), which contributes to understanding participant experience.

2.2.4. Why IPA was chosen for this project

Due to the complex nature of the subject area for the current project (e.g. multiple factors that could be contributing to online use in medical students), IPA was chosen over other qualitative methods because it allows for a more in-depth exploration of how medical students make sense of their online use in the context of their internal and external experiences.

In order to enhance my skills and knowledge in IPA, I attended an IPA workshop (4-sessions) run by an academic clinical psychologist experienced in IPA research and the supervision of IPA projects. The IPA approach followed in this training was in line with the recommendations of Smith et al. (2009).

2.2.5. Qualities of good qualitative research

To improve the quality of qualitative research conducted and have a framework for assessing the quality of qualitative research, Elliott, Fischer, and Rennie (1999) and Yardley (2000) suggest a number of characteristics of good qualitative research. These are shown in Table 2 below. Both papers suggest these qualities should be used flexibly, and more as a guide rather than rigidly followed (Elliott et al., 1999; Yardley, 2000). The current study was conducted in line with most of these suggestions, with the exception of carrying out all of the credibility check characteristics suggested by Elliott et al. (1999). Elliott et al. (1999) suggests using multiple qualitative analysts to check themes, but due to limited resources, I was only able to have access to my thesis supervisors of which two had experience of qualitative analysis. With regards to member checking, this was not conducted as part of the analysis because in IPA, the themes generated are not only based on the words used by participants, but also the researcher's interpretation. Due to this, participant's

views of the themes may differ from the researcher's because the lens through which the data was perceived differs. However, because two of my supervisors were experienced qualitative analysts, I was able to compare two or more perspectives (a characteristic of credibility checks suggested by Elliott et al. (1999)). Some triangulation with participant quantitative data was conducted, but this was limited due to the small sample size (for the quantitative data analysis).

Table 2. Qualities of good qualitative research

Elliott et al., 1999		**Yardley, 2000**	
Quality	*Description*	*Quality*	*Description*
Owning one's perspective	Specify ontological and epistemological position (e.g. pre-existing knowledge and beliefs, the lens through which one views the world).	Sensitivity to context	Context of theory and relevant literature/research essential. Awareness of sociocultural setting of research (e.g. socioeconomic influences on the beliefs, expectations, objectives and discourse of participants and the researcher (e.g. reflexivity)). Ethical considerations at all stages of the study, and being mindful of balance of power are considered crucial.
Situating the sample	Providing at least basic descriptive data (e.g. age, ethnicity, gender).	Commitment and rigour	*'In-depth engagement with the topic; methodological competence/skill; thorough data collection; depth/breath of analysis.'* (p.219)
Grounding in examples	Providing one or two examples (quotes) for each theme.	Transparency and coherence	'*Clarity and power of description/argument; transparent methods and data presentation; fit between theory and method; reflexivity.'* (p. 219)

Providing credibility checks	Several methods exist for checking the credibility of themes, and any can be used. These include: a) checking themes with participants or similar groups (member checking); b) using several qualitative analysts, additional analyst or original analyst to check for errors, discrepancies and overstatements; c) comparing two or more perspectives; or d)'triangulation' with external factors or quantitative data.	Impact and importance	*'Theoretical (enriching understanding); socio-cultural; practical (for community, policy makers, health workers).'* (p.219)
Coherence	Findings presented in a coherent fashion (story or narrative told) without diminishing any nuances in the data. Thematic maps (including boxes and arrows) or other structured way of presenting the data are included in results. A narrative of the thematic map is provided, identifying core themes or categories.		
Accomplishing general vs. specific research tasks	If the aim is to gain a general understanding of a phenomenon, researchers should specify the limitations of extending the findings to other contexts and groups. Where the aim is to gain a specific understanding, should be described and studied systematically and comprehensively enough to help the reader understand. Limitations of not extending the findings		

	more generally should be specified.		
Resonating with readers	Readers feel that the researcher has accurately represented the phenomenon being studied, and brought participant experiences to life.		

2.2.6. IPA: Semi-structured interviews

A single one-to-one semi-structured interview was conducted with each participant, asking open non-leading questions about their online use. This was to ensure data collection was in line with the IPA method in that it allows for the elicitation of medical student's experience of using the online world without the influence of pre-existing assumptions or theory. The aim was for interviews to last around 60 to 90-minutes. Participants met with the researcher on one occasion to complete the semi-structured interview. All interviews were initially going to take place on campus at the University of Leeds, but instead were all completed via online video (Microsoft Teams or Zoom) because of the Covid-19 pandemic restrictions. A topic guide was used in the interviews to guide a discussion that allowed for each individual participant's experience to be elicited (without being too leading to ensure data collection is in line with the IPA method), whilst generating responses that could answer the research question. A copy of the topic guide is in **Appendix B**. All interviews were audio recorded using an audio device connected with an Olympus TP-8 pick-up microphone, and transcribed verbatim by myself or a transcriber authorised by the University of Leeds.

2.2.7. Reimbursement

Participants who took part in the qualitative interviews were reimbursed for their time with a £10 Amazon e-voucher sent to them via email after the completion of the interviews.

2.2.8. Ethical clearance

The University of Leeds School of Medicine Research Ethics Committee (SOMREC) approval was received prior to commencing this project (SOMREC ID: MREC 19-068). No NHS approval was required because only medical students were being recruited. Dr Bridgette Bewick's Pedagogical Wellbeing study, from which participants for the current project were recruited, also received ethical approval from SOMREC (MREC- 19-017).

2.3. Participants

All participants taking part in this thesis project were University of Leeds medical students completing the Bachelor of Medicine and Surgery (MBChB) degree. The MBChB is a five-year medical degree with a structure as follows: 'Year 1 Introducing the fundamentals for clinical practice'; 'Year 2 Building on the fundamentals'; 'Year 3 Increasing clinical exposure with junior clinical placements'; 'Year 4 Gaining in clinical experience with speciality placements'; and 'Year 5 The transition from medical student to doctor' (The University of Leeds, 2021). More detailed descriptions of the course content can be found on the University of Leeds website (The University of Leeds, 2021). Participants from any year of study could participate in the qualitative interviews and there were no restrictions on age.

Smith et al. (2009) argue that the main goal of IPA is to explore an individual's experience, so the focus should be on quality not quantity. Due to this, they state that large sample sizes are not required and that it might be more beneficial for an IPA project to focus on a smaller number of participants. Smith et al (2009) suggest that IPA projects for *'professional doctorates'* (p.52) should aim for between four and ten interviews. The word 'interviews' is used in this case instead of participants as this takes into account the fact that some projects may interview participants on more than one occasion. As this project is for a Doctorate in Clinical Psychology (professional

doctorate), these guidelines were used and a total of seven participants were interviewed for this project. Participants were recruited via a separate study conducted by my supervisor Dr Bewick. Further details about this study and how participants were recruited are below.

2.4. Measures

Three questionnaires were included in the online survey used to screen participants for the qualitative study:

1. **Internet Addiction Test (IAT: Young, 1998) (Appendix A)** is a commonly used 20-item questionnaire measuring Internet addiction. It was used as a measure in this study because it is the most commonly used measure of Internet addiction in research (Laconi et al., 2014), so using this measure meant that participants were more representative of medical students included in quantitative studies. It also contextualised the sample. The IAT was developed by one of the key researchers in this field who also developed the definition of Internet addiction commonly used in research in this area (Young, 1996, 1998). The IAT has been validated in a university student sample with very good psychometric properties (Jelenchick, Becker, & Moreno, 2012). IAT scores between 20 and 49 indicate 'mild' Internet addiction, scores between 50 and 79 'moderate', and scores between 80 and 100 'severe'.
2. **Smartphone Addiction Scale-Short Version (SAS-SV: Kwon et al., 2013) (Appendix C)** is a 10-item tool used to measure smartphone addiction. It was used as an additional measure of problematic Internet use because it focusses on Smartphone use (whilst the IAT picks up on the core components of Internet addiction, it was developed before the mainstream use of Smartphones). This ensured that no medical students were missed because they did not identify with items on the IAT. The SAS-SV has been validated in a number of countries with good reliability and validity results (e.g. De Pasquale, Sciacca, & Hichy, 2017; Lopez-Fernandez, 2017; Luk et al., 2018). SAS-SV scores equal to or above 31 for males or 33 for females indicate Smartphone addiction. For participants who did not identify as male or female,

an average score of equal to or above 32 would have been used. However, as all participants identified as either male or female, this adjusted scoring was not required.

3. **Depression, Anxiety and Stress Scale (DASS-21: Lovibond & Lovibond, 1995) (Appendix D)** is a 21-item measure of depression, anxiety and stress. The DASS-21 was used to measure stress, anxiety and depression in medical students as past research has shown mental health problems to be present in medical students with Internet addiction. Table 3 below shows the scoring for the depression, anxiety, and stress subscales of the DASS-21.

Table 3. DASS-21 Severity Ratings

Severity	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

The measures below were also included in the online survey, but were not used as screening criteria. Instead, these measures were used to describe the sample (in addition to the screening questionnaires) and help contextualise the qualitative findings, which as discussed earlier, is important for IPA research.

- **Demographic** data was obtained from participants (e.g. age, gender, year of study) **(Appendix E)** and used to describe the sample.
- **Warwick-Edinburgh Mental Well-being Scale (WEMWBS: Tennant et al., 2007) (Appendix F)** is a 14-item measure of wellbeing. As student wellbeing has been found to be affected by the presence of Internet addition (Cardak, 2013), it was important to include a measure of wellbeing. Data obtained from this measure will be used to contextualise the sample. Each item is scored on a 1 to 5 Likert scale (1 = None of the time and 5 = All of the time), and the sum of all responses calculated (minimum 14 and maximum

70). The higher the score the better mental wellbeing. The average score on this measure for students is 51.8 and for 16-to-24-year olds it is 51.7 (Stewart-Brown & Janmohamed, 2008). Participants scores will be compared to the above means because they are all students and aged between 16 and 24-years old.

2.5. Procedure

2.5.1. Recruitment

All the aforementioned measures were included in an existing online survey used in a related, but separate project (conducted by one of my supervisors, Dr Bewick) investigating student wellbeing and the university experience (MREC- 19-017). All students enrolled in the MBChB programme at the University of Leeds were invited to complete this survey.

Once medical students completed all the questionnaires for Dr Bewick's project, they were presented with the additional screening measures for the current study. If participants chose to complete the additional measures, after completion, they were asked if they would like to be contacted for an interview and/or future studies. Only those who consented to being contacted and met inclusion criteria (more information about this below), were approached to participate in an interview for the current project.

Participants were recruited to the online survey via online messages distributed by School of Medicine Programme Leads, Module Leads, and Service Education Service (SES) staff. Online messages (e.g. Minerva, email) included an embedded URL that linked students to an online participant information sheet and consent form. Participants were selected and approached to take part in the qualitative study based on their responses to the online survey.

A total of 35 MBChB students were identified as being eligible and were invited to participate in the interview. A total of seven MBChB students agreed to be interviewed for the current study, and this was the final number of participants recruited.

2.5.2. Inclusion criteria for qualitative study

Only medical students studying at the University of Leeds could take part in the interviews. Smith et al. (2009) advised that IPA researchers aim to have a *'fairly homogeneous sample, for whom the research question will be meaningful'* (p.49), so having all participants studying the same course (i.e. MBChB) at the same university was how this study did this. Smith et al. (2009) acknowledges that participants will differ in some ways, but that some participant characteristics would need to be homogeneous to balance this.

Based on past research in the area of online addiction and mental health of medical students, the inclusion criteria for this qualitative study was:

- Identified as having at least mild Internet addiction. Participant scores on the IAT (at least mild Internet addiction) or SAS-SV (meets Internet addiction scoring criteria as described earlier) measures determined this.
    - This was chosen as an inclusion criteria because past research found that Internet addiction rates in medical students is higher than that in non-medical students. Further, the focus of this project was problematic Internet use in medical students, so participants in the qualitative study were required to be experiencing at least mild Internet addiction.
- Be experiencing at least mild stress, anxiety and/or depression. Participant scores on the DASS-21 measure (see Table 3 above) was used to determine this.
    - Past research has found that most people with Internet addiction also have mental health problems, and medical students have been found to be experiencing stress, anxiety, and depression in a number of studies. Due to this, it is important that the sample of medical students included in the qualitative interviews were experiencing at least mild stress, anxiety, or depression to reflect the common characteristics of medical students with Internet addiction.

2.5.3. Inviting eligible participants to the qualitative interviews

All participants who completed the online screening survey, agreed to be contacted about the qualitative study, and who met the above inclusion criteria were invited to take part in the qualitative study. In order to prevent any bias during the interview and analysis stages, I did not identify eligible participants. Instead, my supervisor Dr Bewick identified eligible participants, so that I did not see participant scores on the measures prior to interviews or initial analysis. This was to prevent participant survey scores influencing data collection and/or analysis. An email invite and participant information sheet **(Appendix G)** was sent to eligible participants by Dr Bewick, and I was copied into these emails. Participants were asked to contact me if they were interested in taking part. Participants were allowed at least 48 hours to respond to the invite before being contacted again. This was to allow them time to read the participant information sheet. A reminder email was sent to participants who had not responded to the initial email. This process was repeated until a sufficient number of participants were recruited for the study. As there was a steady stream of eligible participants, there was not a situation where there were too many participants to select from at any one time (i.e. there was not a situation where there was a requirement to choose between many eligible participants).

Once participants agreed to take part in the study, a date and time was arranged to conduct the semi-structured interview online. All interviews were conducted on either Microsoft Teams or Zoom and audio recorded using a Dictaphone and Olympus TP-8 pick-up microphone. Participants gave verbal consent to take part before the interview commenced. Participants did this by reading aloud statements on the study consent form **(Appendix H)** and stating 'I agree' after each statement. Consent was also audio recorded in a separate audio file to the interview recording. Only after the interviews and analysis was completed did I gain access to participant responses (scores) to the aforementioned quantitative measures used for screening and/or describing and situating the sample. This data was used only at the writing up stage to situate the sample and, where relevant, incorporated this into the findings and discussion.

2.5.4. Incentive

All medical students who completed the online screening survey were entered into a prize draw to win an Amazon voucher (1st prize £30, 2nd and 3rd prizes £10) regardless of whether or not they are selected to be invited to take part in the qualitative interview.

2.6. Pilot study

The first MBChB student to take part in the qualitative interview was the pilot case. There was no change to the topic guide following the interview as it appeared to work well in obtaining appropriate data.

2.7. Analysis

2.7.1. IPA data analysis

Smith et al. (2009) suggest a method of analysing data in IPA studies, but state that this is not a prescribed singular method of conducting analysis. IPA analysis is summarised as moving from the individual to shared experience, the descriptive to the interpretative, committing to understanding participant perspectives, and using a psychological lens to focus on meaning-making in certain contexts (Smith et al., 2009). Table 4 below shows the steps of analysis used for this study. As Smith et al. (2009) stated, the process was not linear as there was a requirement to go back and forth through stages.

N-Vivo-12.6 (N-Vivo), a qualitative analysis management software programme, was used at different points of the analysis (as described in Table 4). All transcripts were uploaded into N-Vivo. Separate files were created for each participant to allow individual analysis to be conducted initially, followed by a group analysis.

2.7.2. Descriptive statistics to contextualise the sample

IBM SPSS Statistics 25 (SPSS) and Microsoft Excel were used to screen participants and conduct descriptive statistics for the current study.

Table 4. Steps of IPA analysis used for the current study (adapted from Smith et al., 2009, p. 79-107))

IPA analysis strategy	How strategy was applied in the current study
1. Read and re-read transcripts. Read first alongside listening to audio recording of the interview to get a real sense of the participant and immerse self in data.	Transcripts uploaded into N-Vivo and read in this programme alongside listening to the audio recording.
2. A *'close line-by-line analysis of the experiential claims, concerns, and understandings of each participant'* (p.79).	N-Vivo used to create 'Nodes' (highlighting text in the transcript and giving it a name), as part of line-by-line analysis.
3. Identify emergent themes. Highlight similarities and differences in individual cases and across all participants.	All Nodes printed off on paper after initial line-by-line analysis for each participant. Nodes were then cut out and organised into emergent themes. These themes were then created in N-Vivo. Descriptions of emerging themes were added in N-Vivo.
4. *'The development of a 'dialogue' between the researchers, their coded data, and their psychological knowledge, about what it might mean for participants to have these concerns in this context…, leading in turn to the development of a more interpretative account.'* (p.79).	Annotations and memos created in N-Vivo to record researcher's *'dialogue'* about emergent themes.
5. Develop a structure to illustrate themes and relationships between them.	Use of a white board to create themes and subthemes using the emergent themes in N-Vivo, and mapping out relationships between them.
6. Organise data in a way that allows process of analysis to be tracked throughout the whole process.	As well as using N-Vivo as a way to record emergent themes for each participant, photos were taken of printed Nodes after they were organised into themes as well the development of themes on the whiteboard.
7. Supervision used to discuss themes and *'develop the coherence and plausibility of the interpretation'* (p.80).	Regular fortnightly supervision sessions were used to discuss themes.
8. Develop a *'full narrative'* using *'detailed commentary on data extracts'* (p.80) illustrating interpretation of participant accounts (themes) to the reader. Provide a *'visual guide'* to structure of themes.	Themes described in detail along with quotes from transcripts in the report section of this thesis. Themes also illustrated in Figure 1.
9. Reflect on *'own perceptions, conceptions and processes'* (p.80).	Reflections of my own beliefs and experiences and how they could have influenced the interviews and my interpretation of analysis is provided in the methods, results and discussion chapters.

2.8. Reflexive statement

Mason (2002) recommends researchers engage in a process of reflexivity when conducting qualitative research, and that the process of reflexivity should recognise:

> *'…the extent to which your thoughts, actions and decisions shape how you research and what you see.'* (p.5).

This is based on the idea that as a researcher, I cannot be completely neutral (Elliott et al., 1999). Further, this process also serves to help readers to understand the researcher's results (e.g. consider the lens through which the researcher conducted the analysis), and think about possible alternatives (Elliott et al., 1999). This is identified as one of the characteristics of good qualitative research laid out in Table 2 earlier (Elliott et al., 1999; Yardley, 2000).

Before moving onto the results, I reflect here on my own personal and professional experiences and how they could influence the results of the current study. Firstly, as a trainee clinical psychologist, like medical students, I am on a course that involves a lot of competing demands. This could have resulted in me making assumptions about participants experiences related to these demands. However, the fact that I was on a completely different course meant I was able to be more neutral in relation to discourse about course activity for example. Clinical training also involves learning about and creating of formulations (e.g. with service users on clinical placements), which involves taking a perspective of *'What's happened to you?'* and considering different factors (e.g. environmental, cultural, cognitions) that could be contributing to an individual or group's difficulties. This is an approach I embrace and value as part of clinical practice. I think my openness to many different factors that could be contributing to medical student's use of the online world means that I will be less likely to miss important data.

Secondly, the only form of social media I currently use is WhatsApp. I have never used Snapchat, Instagram, TikTok or Facebook. I used Twitter for a brief period (approximately 6-months) for research purposes (last used about three years ago), but I have never used Twitter in a personal capacity. The fact that I do not use most of the mainstream social media platforms meant that I was able to approach the development of themes with more neutrality.

Finally, certain demographic information could have influenced my approach to analysis in the current study. I was the first in my family to go to university, so I may have identified more with the stories of participants who talked about this being the case for them. I am also a mature student (fall into an older age bracket than the participants in this study) who is at a different stage of life to medical students. I feel that this reduces the possibility of me overidentifying with medical student's experiences at their stage of life.

Results

This section presents the results from this study. It starts with some quantitative information (demographics and scores on measures) for all participants, collected at the screening stage, and presented here to contextualise the sample. To help readers get a more in-depth sense of each participant and their background, pen portraits are presented next. A group analysis follows, which includes the themes generated across all participants. This section ends with a summary of the perceived impact of the Covid-19 pandemic on medical student's online use and this study. All participants have been given pseudonyms to protect their identities, these will be used throughout.

3.1. Participants

A total of seven participants were recruited and interviewed for this study. All participants were University of Leeds MBChB students, aged between 18 and 22 years, and all met criteria for Internet addiction as assessed by the IAT. These were the homogenous characteristics of the sample, which fit with the recommendations of Smith et al. (2009) of having a *'fairly homogenous sample, for whom the research question will be meaningful'* (p.49) to help balance differences between participants. The mean interview time was 56.19 minutes.

Below are two tables with additional information about each medical student. Table 5 provides demographic information for each participant. The mean age of participants was 19.43 years (standard deviation = 1.51). Most participants were female (71.42%, n = 5), UK students (85.71%, n = 6), from a white background (85.71%, n = 6), and in their first or second year of medical school (85.71%, n = 6). With regards to whether participants were the first in their immediate family to attend university, 42.86% (n = 3) of participants reported that they were the first to attend university, 28.57% (n = 2) reported both parents had graduated university, 14.29% (n = 1) reported neither parent graduated university, but they were not the first in their immediate family to attend university, and 14.29% (n = 1) also reported both parents did not graduate university, but it was unclear if they were the first in their family to attend university.

Table 5. Demographic information for participants (N = 7)

Participant (Pseudonym)	Year of Study	Age (Years)	Gender	Ethnicity	Fee Status	First from family to go to university?
Alistair	1	18	Male	White/White British	UK/Home student	Both parents graduated University
Isabella	1	18	Female	White/White British	Non-UK student	Neither parent graduated University - Not clear if first in immediate family to attend University
Josie	2	21	Female	White/White British	UK/Home student	Neither parent graduated - Not first in immediate family to attend University
Grace	1	19	Female	White/White British	UK/Home student	Both parents graduated University
Tom	4	22	Male	White/White British	UK/Home student	Neither parent graduated from university, they are the first member of their immediate family to attend university.
Farrah	1	19	Female	Asian/Asian British	UK/Home student	Neither parent graduated from university, they are the first member of their immediate family to attend university.
Emma	1	19	Female	White/White British	UK/Home student	Neither parent graduated from university, they are the first member of their immediate family to attend university.
Mean score		*19.43*				
Standard deviation		*1.51*				

Key: White/White British = English/Welsh/Scottish/Northern Irish/British or Any other White background*;* Asian/Asian British = Indian/Pakistani/Bangladeshi/Chinese or Any other Asian background

Table 6 below shows individual and mean total scores on measures of online addiction (IAT and SAS-SV), mental health (DASS-21), and wellbeing (WEMWBS). In addition to meeting criteria for Internet addiction on the IAT, three participants (42.86%) also met criteria for Smartphone addiction on the SAS-SV, three participants (42.86%) also met criteria for being at high-risk of Smartphone addiction (42.86%), and one person (14.29%) did not meet any criteria on the SAS-SV. All participants were experiencing at least mild depression, anxiety and/or stress as measured by the DASS-21. Participant's mean severity score for depression and stress was moderate, and severe for anxiety. The mean score for wellbeing was below the average for other students and people in their age range (Stewart-Brown & Janmohamed, 2008). Participants with the highest scores on measures of online addiction were found to have lower wellbeing scores.

Table 6. Participant mental health, online addiction, and wellbeing scores (N = 7)

Participant (Pseudonym)	**IAT Total**	**SAS-SV Total**	**DASS-21 Depression**	**DASS-21 Anxiety**	**DASS-21 Stress**	**WEMWBS Total**
Alistair	39 (Mld)	25*	6 (Nm)	8 (Mld)	10 (Nm)	55
Isabella	27 (Mld)	24*	14 (Mod)	10 (Mod)	22 (Mod)	52
Josie	72 (Mod)	**51**	42 (ES)	42 (ES)	42 (ES)	21
Grace	37 (Mld)	16	12 (Mld)	4 (Nm)	8 (Nm)	62
Tom	56 (Mod)	**31**	8 (Nm)	6 (Nm)	24 (Mod)	47
Farrah	66 (Mod)	**42**	30 (ES)	36 (ES)	34 ES)	36
Emma	24 (Mld)	28*	18 (Mod)	26 (ES)	20 (Mod)	53
Mean scores	*45.86 Mld*	*31.00*	*18.57 Mod*	*18.86 Sv*	*22.86 Mod*	*46.57*
Standard deviation	*18.93*	*11.83*	*13.00*	*15.61*	*12.16*	*13.82*

Key: IAT = Internet Addiction Test; SAS-SV = Smartphone Addiction Scale - Short Version;
Bold = Criteria met for Smartphone addiction as defined by the SAS-SV; * = At high-risk of Smartphone addiction as defined by the SAS-SV;
DASS-21 = Depression Anxiety and Stress Scale (21-items);
Nm = Normal; Mld = Mild; Mod = Moderate; Sv = Severe; ES = Extremely severe;
WEMWBS = Warwick-Edinburgh Mental Well-being Scale (Average score for students = 51.8, average score for 16-24-year olds = 51.7 (Stewart-Brown & Janmohamed, 2008));

3.2. Pen portraits

The following pen portraits provide a summary of each individual participant's background information (descriptions of key characteristics and experiences of each person), to help add some context to the group analysis and how their background may be influencing their use of the online world.

3.2.1. Participant 1: 'Alistair'

Alistair is an 18-year-old white male UK medical student. Whilst Alistair was in his first year of study at the time he completed the screening questionnaires, he was in the early stages of second year at the time of the interview. Alistair reported a very early interest in medicine (from around age 3 years) and talked about how he worked towards achieving this his whole life:

> *'Erm so I've just tasked my work life and later my life in general to achieving that so volunteering, tailoring my subjects at school, learning about medicine and key biology, erm and it paid off and I'm here now.'*
>
> (Lines 29-31).

Alistair struck me as someone who was very well embedded in the medical school community as he talked about how easy it was for him to make friends at medical school, and often made reference to the importance of medical students supporting each other through different aspects of the course. For example, Alistair talked about the *'shock'* (line 99) of seeing a dead body for the first time, and how having the shared experience and support of other medical students helped:

> *'Well erm to start with the dissection room example, it kind of helped that you were there experiencing it for the first time with lots of other people, so it was new to you all, you kind of discuss it in between, you kind of erm you go through that together.'*
>
> (Lines 107-109).

Keeping connected with medical school friends online, therefore, was very important for Alistair in relation to medical school activity. I also got a strong sense of Alistair feeling he fitted-in well with the medical school community, and felt a real sense of belonging to that group.

Alistair's first online use was on a family computer at around age three or four years, and he first used this for playing games online. Alistair talked about how his online use was restricted by his parents as a child. Alistair got his first online device at

around age 11 years, and when he got a choice of what he could access on the online world, he chose YouTube. Alistair still uses YouTube a lot now for entertainment and to *'switch my brain off'* (line 324). Whilst Alistair talked positively about YouTube, he also talked about how it can sometimes make him feel *'depressed'* when he watches something sad. In an attempt to alleviate this sad feeling, Alistair would go on to use YouTube to find something to watch to improve his mood, thus keeping him engaged with the online world.

Whilst Alistair talked about using the online world to cope with medical school demands, it was also clear that being engaged in physical activity was another way of coping for him:

> *'Erm, I do a lot of sport which generally kind of helps take your mind off it… I keep myself active erm I mean it's fun obviously I like doing it and it helps keep your mind away from medicine.'*
>
> (Lines, 183-186)

Throughout the interview, I got a sense that Alistair was a person who cared about others and at times could potentially put other's needs before his own. I got a sense that Alistair felt this was what was expected from him as a medic:

> *'…the whole ward … it's a busy place, no one really has time for you because the main priority is the patient obviously, so it can be quite difficult to kind of get involved and stop just observing…'*
>
> (Lines 82-85)

It seems that Alistair's kindness and thoughtfulness of others contributes to his feelings of sadness when watching videos online. Throughout the interview, I got a sense that Alistair was confident and sensitive, by the way he talked about his experiences. It felt like he was aware of his strengths, but was also self-aware enough know when he needed support.

3.2.2. Participant 2: 'Isabella'

Isabella is an 18-year-old white female non-UK medical student. Like Alistair, Isabella was in her second year of study at the time of the interview, but in her first year at the time she completed the screening questionnaire. Isabella told me that she wanted to take part in the study *'just to help out'* and because she found the research

question quite interesting. Isabella decided she wanted to be a doctor when she was seven years old.

Isabella struck me as someone who was coping well with medical school as she talked about it not being as tough as she thought it would be, and how she still has time to socialise and engage in activities with friends alongside medical school:

> *'**Interviewer:** Oh okay, okay um and how are you finding medical school?*
>
> ***Isabella:*** *Well, I I thought it would be much tougher and much more just sitting at a desk and studying because you know that's what everyone's talks about medical school, just learning all the time, but actually I didn't find myself doing that and actually it wasn't that bad.*
>
> ***Interviewer:*** *Okay.*
>
> ***Isabella:*** *But I really enjoyed it 'cause I still have to have time to do sports with friends. Be able to go on trips and things like that, and study at the same time.'*
>
> (Lines 50-56).

However, Isabella talked about this year being tougher because she has less motivation because she is on her computer more (due to the pandemic).

Isabella's first online use occurred at around six years of age, and this was using a computer outside of the family home because they did not have one at the time. Isabella said she only got to use this a few times a year as a treat. Isabella played educational games online using this device. Isabella talked about how her parents discouraged using the online world, giving an example of how they like to go on holidays where there was no Internet connection, and how her mum would be *'horrified'* (line 582) by her current online use. Isabella bought her own first device at age 10 years, and this was a computer she saved up for a year to purchase.

Despite her parents discouraging online use, it seemed that this did not deter Isabella from wanting to be a part of the online world, particularly social media. I got a sense that connecting with friends was very important to Isabella and using the online world to connect with them was a key part of this (e.g. going online to find something interesting to share with her friends). Isabella talked about some strained family relationships describing her family as *'conflictual'* (line 112), so perhaps having friends to engage with was an escape from family life growing-up.

Isabella talked about how she used to use the online world mainly for leisure purposes and to relax and *'just take your mind off things'* (line 229) after being at

school or doing homework. Now she is at medical school, Isabella advised she uses the Internet for both education and relaxation equally. Isabella talked about how she was trusted by her parents to manage her own workload growing-up in the sense that she reported they were happy for her to engage in leisure activities as long as her school-work was completed:

> *'And I was always quite free as a kid to do pretty much what I wanted. As long, obviously, I mean there were like, I know your homework's done, I know you have good grades school, so I'm not worried…'*
>
> (Lines 251-253)

This made me think about how well Isabella appears to manage her university work and social life (I got a sense of a good work-life balance), and how this is possibly connected to her being trusted and socialised to this idea from an early age. This perhaps helped with her transition to medical school.

I found the interview with Isabella quite tricky because the online connection was poor, so I had to repeatedly ask her to repeat what she was saying. In addition to this, her video was not working, so I could not see her. I feel this could have impacted on our ability to communicate with one another at times, and I was not always able to get a sense of her as a person because I was spending time trying to focus on trying to hear what she was saying, and I did not have any visual cues to pick-up on. However, listening back to the interview, I felt Isabella came across as quite confident and playful in nature.

3.2.3. Participant 3: 'Josie'

Josie is a 21-year-old white female UK medical student in her second year of medical school. Josie said she took part in the interview because it would allow her to reflect on her own online use. I found Josie to be very articulate and well engaged in the interview. She told me that it felt good to talk about her experiences.

Josie became interested in medicine aged around eight or nine years. This interest was initiated by a desire to understand her own physical illness and wanting to help other children with similar experiences. Josie's passion for medicine was clear:

> *'**Interviewer:** And in terms of medical school now you've there, how are you, how are you finding it?*

Josie: *I'm absolutely in love with it, like it's everything I thought would be.'*

(Lines 66-68)

Josie's physical illness meant she missed a lot of secondary school and had to work really hard for her GCSE's, which paid off as she obtained excellent grades throughout. Josie went onto successfully complete her A-levels, and was surprised when she was accepted into medical school:

'But come like my A-Levels time, I really did not think I was going to get in, in all honesty, because my health kind of got worse and I ended up and taking a gap year.'

(Lines 44-45)

Josie's first online use was aged four or five years at primary school for education purposes. Josie told me she grew-up around technology as her parents had phones and a computer and her older siblings all had phones, but the first time she was allowed to use a device to connect with the online world was at school. Despite growing-up around technology, Josie said her mum was *'quite restrictive'* (line 251) with her online use as a child. The first online device Josie had was a mobile phone at age seven years, which she used to play games. Josie talked about feeling *'excited'* (line 231) about receiving this and linked this to feeling social pressure to fit in with other children at school and *'just look cool'* (line 232) as well as fitting in with her siblings:

'So like I've quite a lot of siblings, and my older siblings, they'd be like on their phones all the time, and this that and the other. So I was like oh, I wanna do that and like I wanna just do what everyone else is doing as a normal kid.'

(Lines 246-248)

The use of the term *'normal kid'* in the above quote made me wonder whether fitting-in was particularly important to Josie because of her childhood illness and feeling different from other children because of this.

Josie talked about how she felt she did not fit-in to the medical school community because she was from a different background than most medical students:

'For me personally, I've never really clicked very well with people on my course. Um cos we just come from quite different backgrounds, the majority of students. Obviously, I'm not going to generalise for every single one of them, but the majority of people I've met either usually most of the parents have been to university. If not both the parents are doctors or they've been to a grammar school or a private

school. Um and from a well-off background, and that's just kind of not me and, so I didn't really fit in very well, whatsoever.'
(Lines 117-122)

Josie told me that she sees her peers more as colleagues rather than friends. This felt like the polar opposite to Alistair's experience of medical school in terms of peer relationships, and I wondered how this affected Josie's ability to cope with medical school. It is clear from the above quote that Josie feels that the difference in class between her and other medical students acts as a barrier to her being able to connect and be friends with them, and links to her feeling she does not fit-in with her peers. It is also possible that Josie could have been more sensitive to feeling different from other students because of her physical illness, and perhaps medical school could have triggered negative feelings of difference from her earlier childhood experiences.

Josie talked about having other friends from back home and from non-medical school courses. However, Josie said that because of the demands of medical school, it was hard to maintain friendships because she did not have as much time to socialise as her friends did. Josie also talked about how her friends (from other courses) did not understand why she could not socialise as much as they did, and how her friends and family back home treat her *'like the same old person'* (line 190) even though she has matured a lot at medical school. This gave a sense of Josie also feeling like an outcast with her friends and family as well as peers at medical school. Josie also talked about not seeing her family members as much now she is at medical school and how this was hard. Josie advised she felt she was too busy to speak with them often.

Josie talked about how she struggled with her work-life balance in her first year of medical school and that one of her tutors provided additional support to help her think about ways she could incorporate non-medical school activity into her week. Josie advised this was linked to her putting a lot of pressure on herself. This made me think about what Josie had told me about how she worked a lot harder during secondary school because of how much school she missed due to physical illness. I wondered if Josie had internalised this experience to the extent that she was repeating this behaviour at medical school even though it was not always necessary. Josie advised she found the intervention from her tutor helpful and feels she now has more of a work-life balance.

Josie advised she used social media a lot and reported times when she was on social media until the early hours. Keeping up-to-date and connecting with others online was important to Josie, and I got a sense this was more important because of her desire fit-in and need to connect with others. I felt I could relate to Josie in terms of her background, and her interview made me think about times I did not feel I fit in.

3.2.4. Participant 4: 'Grace'

Grace is a 19-year-old white female UK medical student in her first year of study. Grace had recently started medical school and all medical school activity was online due to the pandemic. Grace struck me as a confident and mature person who really wanted to contribute to helping make changes to situations. For example, Grace talked about how she found the first few weeks of medical school difficult related to things generally being unclear. She described her experience as a *'nebulous cloud of medicine'* (line 30). Grace provided a number of ways she felt this could be improved.

Grace decided she wanted to be a doctor in her teenage years after witnessing friends having health issues, and at that time felt that doctors were the only people who could help them. Grace talked about how she wanted to be able to *'help people and give them comfort in the way they* [doctors] *did'* (lines 62-63). Grace was engaged in a number of community and extracurricular activities, and these included activities related to her faith which appeared to be very important to her. Grace talked about how her faith helped her to cope with medical school, and that she has met a lot of friends through religious activities. Grace had not yet been able to make friends with other medical students, which she attributed to the course currently being purely online. However, Grace appeared to have a desire to make friends with peers and I got a sense that this was because she was already starting to realise early on in the course that having other people who understand what medical school is like was important:

> *'I think it's sometimes sometimes you wish you had more doctors in your friends or family just to be able to understand that you don't know anything yet. And that you and that they understand what it's like to be at medical school and learning.'*
>
> (Lines 197-199)

Grace first used the online world aged around seven years and this was at school for educational purposes. Grace advised she found her first experiences of the

online world *'underwhelming'* (line 253) because it was related to a subject area she did not enjoy. Grace had little exposure to the online world at home because online use was discouraged by her parents and was restricted as a child. It appeared that Grace was socialised to the idea that too much online use was bad by her parents, which was evident in the way she talked about the online world in the interview. However, Grace told me she was excited when she got her first device as she felt this gave her more freedom to connect with others. I got a sense from the interview that using the online world to connect with others was still important to her. Grace had talked about how being at medical school offered her more freedom to make her own decisions because when living at home her parents had the view of:

> *'...we are adults and you as a child and therefore they were more, they they had the right to be correct in most situations…'*
>
> (Lines 151-153)

This made me wonder if this was why she was so excited about having her first online device because it allowed her a bit more independence and freedom as a child because she was able have more access to the online world, which was otherwise restricted. Whilst Grace felt the online world had positive aspects, it appeared she had a preference for the offline world, which could be linked to her parents' negative views and online restrictions growing-up:

> *'...I quite like life when I don't have to be online all the time...I don't like the online world that much.'*
>
> (Lines 282 and 287).

Whilst the pandemic contributed to Grace's negative feelings of the online world in the sense that it resulted in her resenting the online world, I got a sense from the interview that even before the pandemic, she preferred the offline world. This was because of the way she talked about the usual activities she engaged in pre-pandemic (e.g. guide leader, charity work, attending church services, sea swimming, playing the piano). Despite this, it was very clear that Grace felt that the online world was essential for life when she talked about it sounding *'dystopian'* if the online world were not to exist. This struck me as quite a strong statement from a participant who reported to prefer the offline world to the online world. Throughout the interview I got a sense that Grace had a strong community spirit (e.g. the way she talked about

engaging in religious and voluntary activity, and how from the start of the interview her talking about ways medical school could improve the experience of students). I wondered if this statement is related to this community spirit, and Grace thinking about the impact no Internet would have on the world as a whole rather than just on herself.

3.2.5. Participant 5: 'Tom'

Tom was a 22-year-old white male UK medical student in his fourth year of study. Tom was interested in taking part in the interview to help, and because the section of the screening questionnaire related to online use resonated with him (he felt he spent a lot of time online when he should be doing other things).

Tom's serious interest in medical school started at around age 16 years. Tom talked about still keeping his options open when choosing his college courses as he was not fully committed to medicine at that point. Tom described medical school as *'good'* (line 60) and advised he was enjoying his current placement. Unlike new first-year medical students, Tom's placement was face-to-face because face-to-face placements were prioritised in more senior years during the pandemic. Tom told me that he did not feel that the pandemic had impacted on his course too much. Tom said it can *'definitely be quite tiring'* (lines 60-61) doing his placement alongside academic medical school commitments. Tom talked about how at the start of each year he found the course *'really daunting'* (line 120) because of uncertainty about how much depth to learn different subjects in for examinations. This made me think about the *'nebulous cloud of medicine'* that Grace talked about, and highlighted to me that this feeling of there being a lack of clarity at medical school perhaps does not go away in later stages of the course. Whilst Tom felt it made sense to *'teach yourself'* (line 123), he felt more guidance was needed. He also felt medical school required a lot of self-motivation because of the self-directed nature of the course. Tom described medical school as '*type-two fun'* (lines 96-97) because it is hard work at the time, but when he looked back he felt a sense of achievement.

Tom first used the online world when he was about five years old when his parents introduced him to educational games. Tom advised he later went onto gaming with his friends. Tom's first online device was a gaming console (shared with his brother), and he used this for online gaming and for chatting with friends. Since being

at medical school, Tom does not play video games very much and has stopped watching game-related videos online. Instead, he advised he watches YouTube videos for entertainment or educational purposes and listens to Podcasts. This appeared to be linked to a sense of him being older and more mature.

I got a sense from the interview with Tom that he appeared more accepting of the medical school and its demands than other participants. I wondered whether this was related to the stage he was at in the course and/or whether it was related to him being quite open about whether or not he wanted to be a medic before getting on the course, and so the worry of failing is less intense to him.

3.2.6. Participant 6: 'Farrah'

Farrah was a 19-year-old Asian female UK medical student who like Grace, was in the early stages of her first year at medical school, so all her medical school activity was online. Farrah wanted to take part in the study because she felt wellbeing was important whilst at medical school *'because of how stressful it is'* (line 5). She also advised me she wanted to provide information to help others.

Farrah decided she wanted to be a medical doctor when she was around 16 years old. This decision was related to a number of her relatives having illnesses (including a genetic illness within her immediate family), and her own experience of being in hospital following an accident. Farrah initially had doubts about her ability to get into medical school. After missing out on getting the A-Level grades she needed to get into medical school, Farrah went onto complete an access course and then successfully made it onto the course.

Farrah talked about how she wished tutors would be:

> *'...a lot more clearer in terms of the advice that they're giving and also in terms of what is actually happening behind the scenes'*
> (Lines 216-217)

echoing the issue of a lack of clarity raised by other participants. Farrah also expressed concern and frustration about the fact that anatomy sessions were all going to be online as she felt this could adversely affect her future clinical practice and potentially put lives at risk.

Farrah talked about it being difficult to keep up with the workload at medical school, particularly when she is feeling anxious. However, Farrah also said that because her anxiety was not just related to medical school, doing medical school related work was *'a sort of escape for me from like everything else'* and *'that sort of motivated me to get more work done'* (lines 152-153). Farrah was very open about her mental health experiences and how they impacted on and were affected by medical school and her use of the online world.

I warmed to Farrah very quickly and wondered whether this was because of the way she openly discussed her difficult experiences, whereas I got the sense that other participants were perhaps not as open about this. I also wondered how my clinical background and being used to hearing people talk openly about their experiences felt more familiar to me, resulting in me finding it easier to engage with Farrah. This in turn could have allowed Farrah to feel more comfortable disclosing information about herself, but I also got a sense from the start of the interview that she was more open about her experiences than other participants anyway, so it may not have made much of a difference. I was also aware that Farrah was talking a lot about anxiety and at times wondered whether I would need to help Farrah contain her feelings at some point in the interview. This could have meant there were occasions where I may not have asked follow-up questions. However, as the interview progressed and I adjusted to Farrah's style of communication, I started to relax more and do not feel my thoughts would have impacted on the interview too much.

Farrah's first use of the online world was playing games on a family computer at around six or seven years old. Farrah's first online device was a mobile phone she got when she was 16 years old and she used this to play games and go on social media. Farrah talked about how she was constantly on social media during her adolescence, and that she felt *'really left out'* (lines 496-497) when she was not on social media. Farrah also talked about negative experiences of social media, where she became *'obsessed by how other people were living their lives'* (lines 479-480). Farrah described how comparing herself to others and thinking about what she did not have resulted in her feeling *'quite down'* (line 482). Farrah advised whilst she was privately educated, she was from a *'disadvantaged background'* (lines 417-418), and would also compare herself to other children at school from a more *'privileged background'* (line 421) (e.g. children who *'go on holiday every single year'* (lines

421-422) and have *'designer stuff'* (line 419)). Farrah talked about how her parents could not afford to buy designer things, especially after paying for her education. These parallel experiences made me think about how Farrah's offline negative feelings and experiences extended to the online world. I found it interesting that Farrah considered herself to be from a disadvantaged background despite her parents paying for her private education. I wondered how much of this feeling different was related to her family's financial status or another issue of difference.

Use of social media to connect with friends appeared to be very important to Farrah, which she described as being related to feeling left out if she did not engage in this activity:

> *'Um with social media as well there was a point where I was constantly on social media, like I had to know what everyone was doing and what was going on, and if I didn't know I felt really left out.'*
>
> (Farrah, lines 494-497).

There was a strong sense that fitting in was very important to Farrah:

> *'Um I think there was a point where I used to watch like these really cringey um like dramas, teenage dramas and stuff. But looking back I just I don't really think I enjoyed them. I think it was more just like everyone was watching it, so I should watch it as well.'*
>
> (Farrah, lines 491-494).

This was also highlighted by her extensive use of social media that led her to have to uninstall apps because they were having an adverse effect on her mental health.

Farrah advised that whilst she has a more mature view of the world in the sense that she realised having expensive things does not make you a better person, social media can still at times trigger mental health difficulties. To reduce the impact of social media on her mental health, Farrah advised she will at times uninstall social media apps (e.g. Instagram) when she notices an increase in her anxiety. However, Farrah also mentioned that she will at times use the online world more when experiencing anxiety, which, as it did with Alistair, keeps her engaged in the online world. One of the things Farrah looked-up online was physical symptoms she was experiencing in order to gain reassurance she was not very ill. This made me think about how Farrah's childhood and current experiences of illness in the family contributed to her health-related anxiety and resulting online use.

Farrah also made reference throughout the interview of how she feels she uses the online world in a more responsible way (e.g. being aware of what is and is not reliable information, being careful what she posts online). I got a sense that this was related to her recognition that she was at medical school and there was a requirement for her to behave in a more professional way.

3.2.7. Participant 7: 'Emma'

Emma was a 19-year-old white female UK medical student who like Grace and Farrah, was in her first year of medical school. Emma told me that she took part in the study because she recognised '*it's been quite a difficult year for a lot of people, especially with the transition to online learning*' (lines 3-4) and she wanted to *'provide any information that might make it easier for other people'* (lines 4-5). She also advised she had not taken part in a research study before and wanted to experience *'what a study looks like from the inside'* (lines 8-9).

Emma decided she wanted to be a doctor when she was 15 years old due to her interest in healthcare and science. Like Farrah, Emma was disappointed that face-to-face placements and anatomy sessions could not happen because of the pandemic, but advised she felt this was *'understandable'* (line 91). Emma talked about how she enjoyed medical school even though the workload was *'a bit intense'*, but felt *'how interesting it is kinda makes up for it'* (lines 50-51).

Emma echoed Grace's experience of finding it difficult to meet other medical students online, and advised that she has tried to make contact with peers in other ways (e.g. via Skype, joined football team). Emma talked about how she finds time to socialise with friends despite the demands of medical school, but finds that she is not able to go out as much as her flatmates who are on other courses.

Emma's first online use was on a family computer aged four or five years, which she used for watching YouTube videos and the news. Like most other participants, her online use was restricted as a child. Emma played games the first time she was able to choose what she wanted to do online (aged seven or eight years). Her first online device was an iPhone when she was 13 years old, and she used this for online learning, doing searches on Google and connecting with friends. Emma currently uses the online world for extracurricular activity (e.g. courses related to

medicine), social media, and keeping connected with societies. She also reported recently using it to raise money for charity. Generally, Emma felt that the online world was positive.

3.3. IPA group themes: Medical students making sense of their online use

This section provides a summary of the themes identified across all participant transcripts. The overarching theme is the main theme that underpins and connects to all other themes. The superordinate themes are secondary to the overarching theme, but are also themes in their own right. Subthemes are any other lower order themes that are part of the overarching theme or superordinate themes. The terms 'medical students' and 'participants' will be used interchangeably to refer to participants who were interviewed for the current study.

Socialisation to the online world was the one overarching theme identified in this analysis. Four superordinate themes were also identified from the interview data: transition to medical school life; trapped by the online world; feel a sense of belonging and connection; and the offline world is not as appealing as the online world. A number of subthemes were identified across the overarching and superordinate themes.

Figure 1 below is a thematic map illustrating all themes and their relationships between one another. I will now go onto summarise the relationships between themes. As mentioned above, socialisation to the online world was the overarching theme. This was because this theme had a relationship with all four superordinate themes (as illustrated in Figure 1), and underpinned them. With regards to the transition to medical school life superordinate theme, as medical students were found to be socialised to the online world, this meant that when they transitioned to medical school, they turned to the online world. This was in response to the demands of medical school and to assist with the transition to independence. A two-way relationship is illustrated in Figure 1 between socialisation to the online world and transition to medical school life. This is because medical school requires students to use the online world, and as medical school (in this case the University of Leeds) is a large institution, this requirement contributes to further socialising medical students to

the online world. The use of the online world during medical students' transition to medical school contributed to them feeling trapped by the online world. The fact that medical students were also socialised to using the online world since childhood (e.g. part of their generation) in a number of different ways also contributed to them feeling trapped. This was linked to a sense that there was an expectation to use the online world for various activities (e.g. medical school, socialising), and because they were used to and relied upon the online world for various activities. There was a two-way relationship between the 'trapped by the online world' and 'feel a sense of belonging and connection' superordinate themes. This was because the need to belong and connect with others resulted in medical students keeping engaged with the online world, as illustrated by the fear of missing out subtheme. Being socialised to the online world also meant that this medium was used to try to belong and connect with others. Finally, being socialised to the online world meant that the offline world was not as appealing to medical students as the online world thus increasing their use of the online world. This further contributed to them feeling trapped by the online world. All themes are described in more detail below along with example quotes from transcripts.

Table 7 shows which of the themes each participant experienced. With regards to the development of themes in IPA, Smith et al. (2009) states that whilst there may be an interest in the frequency a theme is supported it is:

> *'…definitely not the only indicator of its importance, and should not be over-emphasized – after all, a very important theme, which clearly unlocks a further set of meanings for a participant, may sometimes be evidenced only once…'* (p.98).

Due to this, the number of times a theme is supported (i.e. the number of participants who experienced the theme) has not been used to decide on whether a theme is featured. Instead, the perceived importance of the theme is used as a measure of whether or not it is featured in the results.

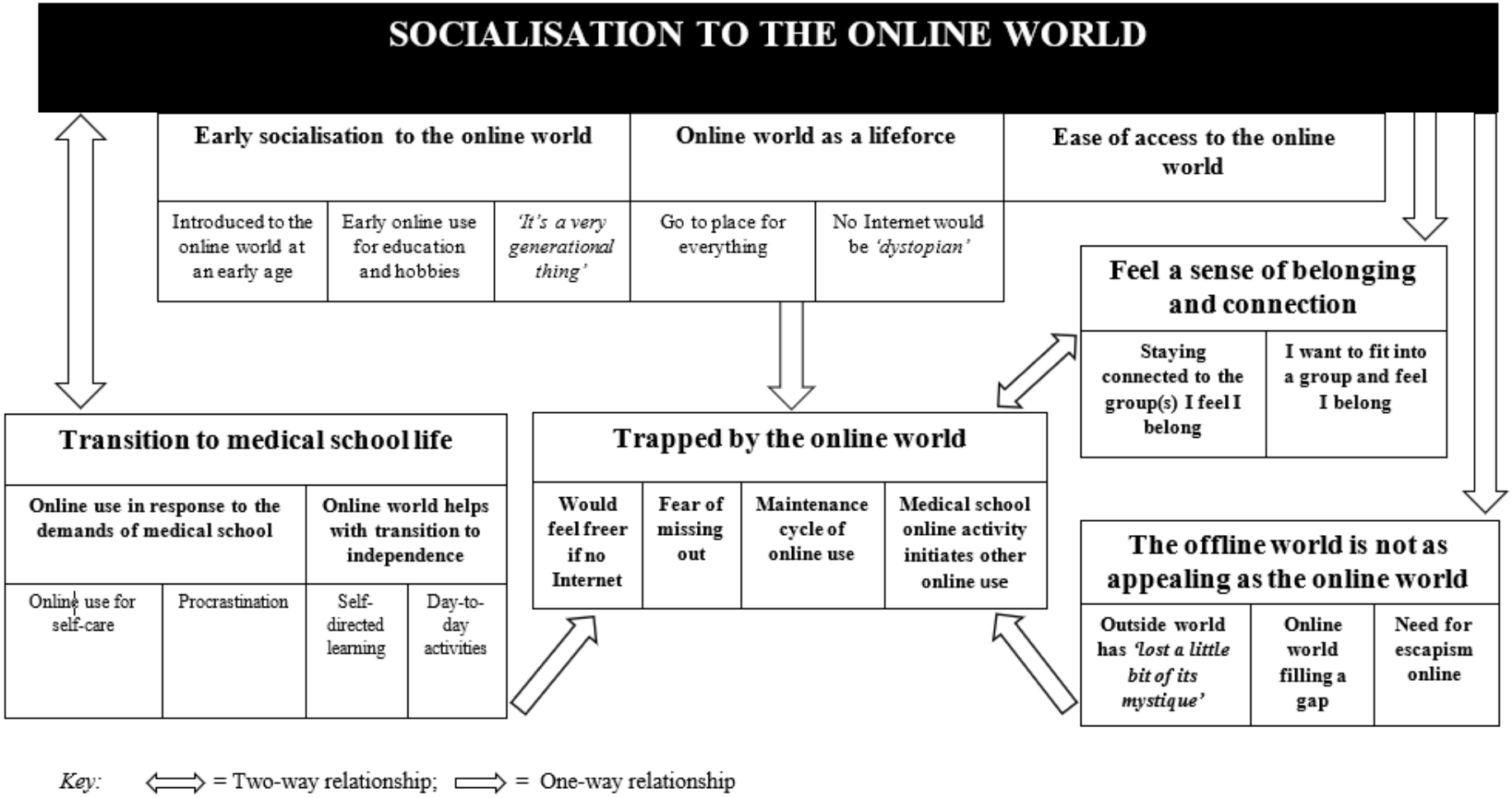

Figure 1. Thematic map of group themes

Table 7. Participant individual themes

OVERARCHING THEME **Superordinate themes** Subthemes	Alistair	Isabella	Josie	Grace	Tom	Farrah	Emma
SOCIALISATION TO THE ONLINE WORLD	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Early socialisation to the online world	x	x	x	x	x	x	x
Online world as a lifeforce	x	x	x	x		x	
Ease of access to the online world	x	x	x	x	x	x	x
Transition to medical school life	**x**	**x**	**x**	**x**	**x**	**x**	**x**
Online use in response to the demands of medical sch	x	x	x		x	x	x
Online world helps with the transition to independenc	x	x		x	x		x
Trapped by the online world	**x**	**x**	**x**		**x**	**x**	**x**
Would feel freer if no Internet	x	x	x			x	x
Fear of missing out	x		x		x	x	
Maintenance cycle of online use	x					x	
Medical school activity initiates other online use					x		
Feel a sense of belonging and connection	**x**		**x**	**x**		**x**	
Staying connected to the group(s) I feel I belong	x			x			
I want to fit into a group and feel I belong			x			x	
The offline world is not as appealing as the online v	**x**	**x**	**x**		**x**	**x**	**x**
Outside world has *'lost a little bit of its mystique'*	x	x	x				
Online world filling a gap	x				x		x
Need for escapism online	x	x	x		x	x	x

Key: **X** = Overarching theme experienced; **x** = Superordinate theme experienced; x = Subtheme experienced

3.3.1. Socialisation to the online world

This overarching theme relates to different ways in which medical students are socialised to the online world. It consists of three subthemes; early socialisation to the online world, the online world is a lifeforce, and ease of access to the online world. Each of these subthemes are discussed further below.

3.3.1.1. Early socialisation to the online world

This subtheme relates to how medical students were introduced to the online world early in life, and includes three lower-order subthemes: introduced to the online world at an early age; early online use for education and hobbies; and *'it's a very generational thing'*. These subthemes are discussed further below.

Introduced to the online world at an early age

Participants were generally introduced to the online world at an early age:

> *'**Interviewer:** Okay okay, thank you for that. So I'm just going to go on to ask some questions around online use now Josie, and so I'll just start by asking you about what are your first memories of your online use?*
>
> ***Josie:** Er, probably in primary school in reception we had loads of laptops and we'd learnt to like spell and do writing, so it probably goes back to when I was about four or five.'*
>
> (Josie, line 210-214)

> *'**Interviewer:** Okay thank you. So I'm going to go on to some more specific questions about your online use now. So I'm going to start by asking what are your first memories of online use and what they are?*
>
> ***Tom:** Probably playing games when I was a young kid I would say. Or I think very vaguely I remember um my parents getting some educational games or something, when I must have been four or five or six. But then after that it would probably have been playing more traditional games with my friends.'*
>
> (Tom, lines 184-190)

> ***'Interviewer:** Okay, so you used it with your parents, and how old were you do you think when you first kind of became aware of the online world, and you started using it with your parents?*
>
> ***Emma:** Four or five I think.'*
>
> (Emma, lines 155-157).

The age medical students reported being introduced to the online world ranged between the ages of three and seven years.

Online use for education and hobbies

Participants talked about how their early experiences of the online world were usually for education (at school and in the home) and hobbies (e.g. gaming or YouTube):

> *'**Interviewer:** Okay thank you. So I'm going to go on to some more specific questions about your online use now. So I'm going to start by asking what are your first memories of online use and what they are?*
>
> ***Tom:** Probably playing games when I was a young kid I would say. Or I think very vaguely I remember um my parents getting some educational games or something, when I must have been four or five or six. But then after that it would probably have been playing more traditional games with my friends.'*
>
> (Tom, lines 184-190)

> *'**Interviewer:** Okay, yeah. I suppose I know that's, they're your first memories of online use, but I'm just wondering when you became aware of the online world, do you think it is?*
>
> ***Grace:** So we we did have IT lessons in school. I remember probably my first memory being online in school was Googling something for a project on India when I was about nine.'*
>
> (Grace, lines 230-233)

This early use appears to have contributed to medical students being more socialised to the online world and a sense of it being very much part of life now they are at medical school:

> *'Um what's accessed, obviously medical school things, so like we have to fill out er like reflections while we're on placement and stuff, or like I say about checking emails, um that kind of thing. Um yeah, yeah.'*
>
> (Tom, lines 390-393).

These hobbies were also used to help participants relax when they were younger, and this was also the case for medical school:

> *'Um, I started to use it more as a leisure tool than a research tool. Um, I would say now I use it equally, but for a time I used it more for leisure than anything else. Because you know, you would come from school, you would do homework and then you would go on the internet and just take your*

mind off of things for that, and that was quite nice, but now I use it equally for both.'
(Isabella, lines 226-229).

Use of social media and chatting with friends appeared to begin more in early adolescence:

***'Interviewer:** Okay, so it sounds like the tablet was kind of yours, but also your family's as well, and I just wondered what you used that for when you first got it.*

***Farrah:** Um I think it, first I used for games, and then as I got into like like I think I was [inaudible, 00:36:33] fourteen I made like an Instagram account, and then I used it for Instagram. But other than that, I didn't really use it for anything else.'*

(Farrah, lines 403-407).

'It's a very generational thing'

Medical students attributed generational use of the online world for the reasons they are socialised to the online world early, and the reason they used the online world a lot more than their parents, but similar to friends:

'But I think it's a very generational thing, so kind of like if you look at kind of my parents' generation, they spend way less time online than me, but then respectively they spend more time online than my grandparents do, but then at the same time, my little brothers and sisters, who are like eight and twelve, they probably spend more time online than me. Like, you know, so there is totally some sort of correlation there.'

(Josie, lines 615-620)

*'**Interviewer:** Okay, I was gonna ask then what do you think the reasons are your parents feel that you use it a lot?*

***Alistair:** Er probably because they've grown up not using it and they are accustomed to doing things er with other methods, so say physical shopping instead of online shopping or erm kind of finding things out using books rather than looking in depth on the Internet. Erm so they're just used to a different way of living I suppose.'*

(Alistair, lines 557-562)

***'Interviewer:** Okay, thank you for that. Um and um what does the online world mean to you?*

> ***Josie:*** *To me the first thing I think of is probably social media, because it's kind of taken over the way that we view society it's kind of ingrained within every part of people growing up within this generation.'*
>
> (Josie, lines 14-17).

The way Josie talks about social media being '*ingrained within every part of people growing up within this generation'* in her last quote above, gives a strong sense of social media being built into medical students by society, which feels inescapable. These quotes illustrate how participants appear to view their online use to be part of the generation they have grown-up in, and how they feel the online world acts as a substitute for activities their parents previously did offline (e.g. reading books, shopping). This point was further illustrated by Tom after he was asked what it would be like if there was suddenly no Internet:

> *'**Interviewer:*** *Okay, I see, thank you. So suppose you woke up tomorrow morning, and there was no internet, what would that be like?*
>
> ***Tom:*** *[laughs] Er, well I think I would panic and think "oh my God, I've got to open a book at some point", actually be reading and have to entertain myself. Yeah, I think it would be quite strange and I would definitely notice it.'*
>
> (Tom, lines 353-357).

Most participants talked about how their online use was restricted as a child by their parents:

> *'...my dad would limit me to like half an hour on the Internet or something...'*
>
> (Alistair, lines 194-195)

> *'But it was quite like my parents were quite strict in terms of you know I wasn't able to use it unless you know my parents were in the room, or there were certain things where, you know, if I was on a certain website or something, I'd be in a lot of trouble and stuff.'*
>
> (Farrah, lines 389-392).

It seems that despite participant's parents efforts to restrict their online access, the fact that the online world is part of medical student's generation meant that it was inevitable it would become a big part of their lives. I wondered whether another

factor was participants feeling free to choose, whereas previously they felt controlled by their parent's generational views of their Internet use:

> *'So obviously when I was first using it, it was my mum's laptop, so she was in control of when and where I used it. Whereas now it's up to me.'*
>
> (Emma, lines 201-203).

I also picked-up on this in Grace's interview when she talked about feeling free from her parents views (as discussed in her pen portrait).

3.3.1.2. The online world is a lifeforce

This subtheme refers to how the online world appears to be a source of life and a go to place for everything that is important to medical students. The fact that so much is online also contributed to medical students being socialised to the online world. It consists of two lower-order subthemes: go to place for everything; and no internet would be *'dystopian'*. These are discussed further below.

Go to place for everything

Medical students talked about how the online world was used for everything. This included education, socialising, videos, and information:

> *'**Interviewer:** Okay yeah, okay. And is there anything else that comes to mind when you know when you think about what it means to you?*
>
> ***Josie:** Um as well as obviously the social media side of things, I think it's a very extensive source of information because literally anything you wanna know it's most likely you Google away. And only recently, kind of in terms of along the time of history have we been able to have access to that information. So it's basically like a massive encyclopaedia of the world's knowledge, you know.'*
>
> (Josie, lines 18-23)

> ***Interviewer:** Okay, thank you. And erm so my next question is suppose you woke up tomorrow morning and there was no Internet, what would that be like?*
>
> ***Alistair:** Erm that would be absolutely terrible, honestly I would you'd be utterly cut-off from pretty much everything every all my work every source of communication or information that I've got other than physical books that I own. Erm you'd be cut off from your friends, you'd kind of feel isolated in a sense er because you just don't have access to I mean with the Internet*

> *you've got access to everything everywhere all of the time, whereas you'd be without it you'd literally be confined to your own personal kind of bubble your own domain like now, so erm it'd be kind of terrifying I think because you'd have no idea what's going on.'*
>
> (Alistair, lines 488-496).

This contributed to the sense of medical students being socialised to the online world because the culture and generation they live in relies so heavily on the online world.

No Internet would be 'dystopian'

There was also a sense that if the online world was to cease to exist, the world would collapse and this would bring chaos and confusion. One participant summed it up as sounding *'dystopian'* (Grace, line 453), which I felt captured the essence of medical students views of this:

> ***'Interviewer:*** *Okay, thank you. So the next question is, suppose you woke up tomorrow morning and there was no internet, what would that be like?*
>
> ***Grace:*** *[sighs] It sounds very dystopian um I think society would honestly begin to collapse within a few days. I think it would be absolute chaos, and I think we've become so completely dependent on the internet. I mean, for one NHS systems would break, people wouldn't be able to get into records. The banks would probably shut down because they had encrypted software, I think. It would just be absolute chaos. It would be crazy.*
>
> ***Interviewer:*** *And what would that be like for you?*
>
> ***Grace:*** *Um I mean, I think it would be very scary for me in terms of 'cause I think the world would start falling apart. I would be a bit upset, that online stuff was gone, but I could still ring people and I could still see them to a degree, but I honestly think that if the internet were to go tomorrow and it was just not come back that society would completely change. There would be some kind of civil unrest and riots. So I think that would definitely preoccupy me far more than any personal notions I had about not being online.'*
>
> (Grace, lines 451-464)

This felt like quite a strong statement from the only participant to state she had a preference for the offline world than the online world. This made me think about how socialised medical students are to the online world on an individual level, but also how they recognised the importance and ubiquity of the Internet to the world.

This concern was also shared by other participants:

> *'**Interviewer:** Okay. Um so, how do you think you would feel if you woke up tomorrow morning and there was no internet?*
>
> ***Isabella:** Distressed, maybe a bit worried about what the rest of the world's going to do, if people are going to go into massive panic, because that can be just scary and dangerous, because you never know how people respond in a crisis. And that's why I think stability's really important and after the toilet paper scare, I mean I, I just expect anything right now.'*
>
> (Isabella, lines 454-457)

> ***'Alistair:** Erm, I initially it would probably just be shock and isolation depending on how kind of organisations move forward from that, erm it'd definitely be annoyance and they'd be negative emotions just because of how useful and how kind of ubiquitous it is in my daily life.'*
>
> (Alistair, lines 499-502)

3.3.1.3. Ease of access to the online world

This subtheme refers to how easy it is to access the online world and how this contributes to socialisation and increased online use. Medical students talked about how they have access to multiple devices from which to access the online world and different platforms, thus allowing ease of access:

> ***'**Um well I use quite a lot of different devices. I have my phone, my iPad, my Mac book, my um desk Mac. I guess my gaming consoles as well, I have a few gaming consoles. And then platforms just kind of already assigned to social media, Facebook, Twitter, Instagram, TikTok, Reddit.'*
>
> (Josie, lines 31-34)

> *'**Interviewer:** Okay. And how do you access the online world?*
>
> ***Isabella:** I mean all the time, you know, through your phone, your computer… and there's different things in shops sometimes also they have online TV sometimes running in the background and stuff like that, it's just everywhere. '*
>
> (Isabella, lines 20-23)

There was also discourse related to the advancement of technology, which also increased access to the online world:

'I'd say there is a difference yeah because I now have so many different ways that I've got a computer, I've got another little one that I use for taking notes and stuff, I've got my phone erm so the things I can use to access the Internet has changed and their capabilities have changed as well so where we used to have one kind of crappy computer we now have much more able computers that you can run much more [inaudible] intensive systems on erm so obviously the capabilities have changed…'

(Alistair, lines 280-285).

3.3.2. Transition to medical school life

This superordinate theme relates to how medical students use the online world to help with the transition to medical school. It consists of two subthemes: online use to cope with the demands of medical school, and online world helps with the transition to independence. Four lower-order subthemes are split across these subthemes, which will be discussed further below.

3.3.2.1. Online use in response to the demands of medical school

Medical students talked about how demanding they found medical school:

*'**Interviewer:** Erm and how are you finding medical school?*

***Alistair:** Enjoyable and erm difficult in the sense that there is a lot of information to keep up with and a lot of organisation that needs doing, and difficult in the sense that it requires a lot especially at the moment of self-motivation, erm but I'd be lying if I said I wasn't enjoying it I am. It is what I wanted to do and what I still want to do so yeah.'*

(Alistair, lines 45-49)

***'Interviewer:** Okay. And how are you finding medical school?*

***Emma:** Er really enjoying it, yeah. The workload's a bit intense, but I think how interesting it is kinda makes up for it.'*

(Emma, lines 49-51).

This subtheme relates to how medical students use the online world in response to the various demands of medical school (e.g. learning new material, examinations, placements, self-directed learning), and consists of two lower-order subthemes within it: online use for self-care; and procrastination.

Online use for self-care

This relates to how medical students use the online world to engage in various relaxing and/or enjoyable activities online (e.g. YouTube videos, gaming) in an attempt to cope with the demands of medical school:

> ***'Interviewer:*** *Okay, and is that for your whole experience for online or are there different times when you have different feelings or?*
>
> ***Josie:*** *Um, I think it depends. I feel like social media side gets quite mindless, whereas the kind of the gaming and music side are a bit more engaging, because it's something that you're paying like a lot more attention to. And with that I feel like quite relaxed and like relieved from a lot of kind of like the stress that's built up in the day.'*
>
> (Josie, lines 379-384).

> *'...occasionally watching a YouTube video if I need to switch my brain off for a little while in between and kind of rest.'*
>
> (Alistair, lines 343-344)

There were also a number of different references to medical students wasting time online or engaging in mindless online activity:

> *'But um I think in terms of what I'm doing, it depends on if I have a purpose of being online. Sometimes I just go online for the sake of being online.'*
>
> (Farrah, lines 561-563)
>
> *'Snapchat, Instagram, Facebook erm just kind of mindless and scrolling on those.'*
>
> (Alistair, lines 355-356)

> *'And then I'd probably use it again for like another hour or two just to I don't even know what I do just waste time before bed on my phone usually that is.'*
>
> (Alistair, lines 346-348)

> *'**Interviewer:*** *Yeah, okay, um and whilst you're online doing these different things, how are you feeling online, while you're, while you're there?*
>
> ***Josie:*** *I feel like I kind of just zone out a lot of the time, so like it's quite mindless, especially with social media you can kind of mindlessly scroll through that and suddenly it's like three a.m. in the morning, and you're like, oh, I was going to bed at eleven. But yeah it is quite mind numbing.'*
>
> (Josie, lines 373-378)

Whilst more stimulating online activities (e.g. YouTube and gaming) were used by medical students to relax, there was a sense that *'mindless'* online activity (usually social media) was another way medical students tried to switch-off from medical school activity. Josie's use of the words '*mind numbing'* in the above quote, made me think about her self-medicating with the online world, like the online world acted as an anaesthetic, numbing the mind from the stress associated with the demands of medical school. I felt this summed up what was being described by other medical students.

Procrastination

Medical students referred to occasions when they used the online world to procrastinate:

> *'**Tom:** ...I do spend quite a lot of time um using things on the internet when I should probably be revising or doing something else. [laughs]*
>
> ***Interviewer:** Okay, I see. So those kind of things that you've noticed. We'll go into this a bit more when we move onto the online section, but I just wondered, thinking about some of those things that you do instead, what kind of things are you doing instead of revising and things?*
>
> ***Tom:** Um, a lot of the time it will be watching videos on YouTube. Sometimes educational, sometimes just like entertainment things, um which I always find is a bit ironic, because I'm learning about something just not the right thing. [laughs] Or maybe I'll be like, I don't really play video games very much when I'm at uni, um but I might be playing like some kind of game with someone online. Um or listening to podcasts, or something.'*
>
> (Tom, lines 10-19).

As illustrated in Isabella's quote below, it seemed it was quite difficult to ignore the pull of doing something different to what she was supposed to be doing:

> *'**Interviewer:** Okay, could you say that again? What what's hard to ignore? Sorry, Isabella.*
>
> ***Isabella:** A little voice, kind of like procrastination in the back of your head, being like oh, you can just use the internet for one more hour that's not gonna hurt you. You know you don't have to start working now.'*
>
> (Isabella, lines 524-527)
>
> *'**Interviewer:** I see okay, okay? And what's it like when that happens?*

> ***Isabella:*** *I mean, sometimes I really listen to that little voice because I I do struggle with procrastination quite a lot, I won't lie.'*
>
> (Isabella, line 528-530).

I wondered if procrastination was a form of avoidance from the amount of work they were required to do for the course for some participants, perhaps it is the immediate feedback or pleasure gained from procrastination activities that keeps them engaged in it.

3.3.2.2. Online world helps with the transition to independence

This subtheme relates to ways medical students use the online world to assist with the transition to independence now they are at medical school. This was in relation to two areas: self-directed learning; and day-to-day activities. These subthemes are discussed further below.

Self-directed learning

Medical students talked about how they are required to do more self-directed learning and activity now they are at medical school:

> *'But I guess the the thing that surprises me about it is how much self-directed learning we do. So a lot of the time we kind of just teach ourselves medicine it feels like, and that surprised me I guess, thinking back to when we first came to medical school, I thought we would have a bit more teaching.'*
>
> (Tom, lines 114-117).

Use of the online world was a big part of this:

> *'**Interviewer:** Okay, okay. And erm what changes have you noticed in your online use since you started medical school in terms of like you access the online world and things like that?*
>
> ***Alistair:*** *Erm checking my emails a lot more, using calendars now, erm looking lots of things up, my Google search history will just be a bunch of medical terms that I just don't know, erm and less yeah yeah so more education heavy effectively erm so because previously what you needed to find out your teachers that you had direct access to usually would know or your parents would know, erm but now it's kind of it's a necessity to kind of getting all the information you need.'*
>
> (Alistair, lines 534-541).

As illustrated in the above quote, the online world also appeared to be used as a substitute for other life guides and sources of information (e.g. teachers, parents), and for accessing more specialist knowledge that their parents would not necessarily know.

Day-to-day activities

Most participants were living away from home whilst at medical school, and what came with this was the need to engage in day-to-day activities such as cooking or shopping. The online world appeared to be used for some of these activities:

> *'Yeah I mean if I'm if I'm bored it's kind of my first instinct is to find some entertainment online erm so if I'm bored, if I need like a recipe or something for tea, erm if I need to know how to do anything pretty much my first port of call is online.'*
>
> (Alistair, lines, 370-373)
>
> *'...I do significantly more online shopping than I used to because they never used to do online shopping.'*
>
> (Alistair, lines 256-257)

> *'Um sort of, oh trying out new recipes, that's something that's quite useful on the Internet.'*
>
> (Emma, lines 316-317)

3.3.3. Trapped by the online world

This superordinate theme relates to the feeling of being trapped inside the online world because it is all consuming. It consists of four subthemes: would feel freer if there was no Internet; fear of missing out; maintenance cycle of online use; and medical school online activity initiates other online use. These themes are discussed further below.

3.3.3.1. Would feel freer if there was no Internet

This subtheme relates to discourse around how medical students would feel freer if the Internet did not exist and would have more *'time'* to do things:

> *'...it might also be a little freeing in the sense that you're not kind of constantly accessible, so like to get to you someone needs to physically I mean presuming there's like phone lines are still up and stuff, to get to you*

someone would physically have to like make the effort to contact you. Erm, you'd be kind of less monitored I suppose erm and life would become slower paced so you'd chill out a little bit more erm I hope that answered the question [laughs a little].'

(Alistair, lines 502-508)

***'Interviewer:** Yeah yeah so thank you it does Alistair thank you. Erm and I guess just adding to that, what do you think you'd notice if the Internet wasn't here tomorrow?*

***Alistair:** Erm other than how much I rely on it, probably that how little I would do with my day otherwise because and how much time I spend sat on my arse because erm yeah because I use it for everything and without it I'd kind of become unstuck at a loose end with just day-to-day activities like er, because so much time is filled by it, I'd have so much time to do other things that I don't think I'd know what to do with myself.'*

(Alistair, lines 508-514)

'But I think um like after a bit I think I'd just be grateful because it's it's just a reason to not like become overwhelmed. I think sometimes the internet can be so overwhelming. So being able to take time away from that. Like I'm assuming like certain things like the course would probably stop, because obviously there's no way to deliver it, or like they'd have to figure out another way to deliver it. So I think during that time I'd be able to I guess spend more time with family, and spend more time doing things that I enjoy, rather than studying.'

(Farrah, lines 750-757)

Use of the word *'time'* in the above quotes makes me think about 'doing time' online, which connected to the perception of being imprisoned inside the online world.

3.3.3.2. Fear of missing out

Some participants talked about a fear of missing out as reasons for engaging in social media, and I got the sense that they felt trapped by their emotional and psychological need to be connected to others:

'Oh, ok, yeah. Um, I think probably ended up spending more and more time online just as I got older purely because everyone else around you is kind of relating to social media and stuff like that. And it's kind of the only way you could kind of keep up with some times kind of thing so like I didn't really used to spend a lot time on social media and stuff like that, until I got older and then everything that was happening was on some sort of social media platform and you kind of had to be involved in that or be left behind, so. I'd say, I'd say just kind of growing up and seeing people around me be posting on all these social media platforms and kind of even when they're not on the social media platforms, talking about being on the social media platforms.

> *Like did you see this on Facebook? Did you see this on Twitter? Kind of made me want to be a part of that, so kind of there's peer pressure, well not peer pressure, but kind of societal pressure, I guess.'*
>
> (Josie, lines 309-318)

> ***'Interviewer:*** *Okay, I see, thank you. So suppose you woke up tomorrow morning, and there was no Internet, what would that be like?*
>
> ***Tom:*** *'... maybe I would feel a bit anxious about missing things, cause I guess it's not just emails that you feel like you have to check. It's also, um you might miss an event on Facebook or something, that you wanted to go to. So, yeah.'*
>
> (Tom, lines 353-359).

Participants reported to check social media as soon as they woke up:

> *'Yeah, okay. Um, so as soon as I wake up, I scroll, like check on notifications on every social media. So Snapchat, Twitter, Facebook, Instagram and TikTok. Um before I even get out of bed.'*
>
> (Josie, lines 348-349)
>
> *'Um so morning when I wake up I check um Snapchat and WhatsApp, see if I've got any messages.'*
>
> (Emma, lines 259-260)

> *'Um I think um when I get up I've got this really bad habit of checking my messages and social media and stuff.'*
>
> (Farrah, lines 569-570).

This need to check messages on social media as soon as they wake up, also felt like a fear of missing out to me. When Josie states she checks *'every social media'*, really gave a strong sense of her making sure she does not miss anything.

3.3.3.3. Maintenance cycle of online use

This sub-theme refers to how distress is caused by the online world (e.g. anxiety, low mood) and how the online world is then used to cope with these difficult thoughts and feelings. Farrah for example, talked about how she turned to the online world when she had some worrying thoughts, how this resulted in her feeling worse, and her then using the online world to help with the additional distress caused by her online searches:

> *Like because I didn't really have anybody else to turn to, the first thing that I would turn to would be the internet. And I think that's quite bad because it sort of I guess made the thoughts worse. You know I would like see something online relating to the intrusive thoughts and be like oh well I'm not experiencing this or I'm fine. But then I'd have it in my mind that oh I need to be experiencing this. And then the next thing you'd know is I'm experiencing what I thought I wasn't experiencing. I think in that sense it's quite negative, but also quite positive because it was how I was able to reach out for help, and how I was able to I guess get more information. And I guess to reassure myself that it's just intrusive thoughts that it's not me being a bad person or it's not um I guess um like like the the thoughts don't mean anything about me.*
>
> (Farrah, lines 898-907).

This gives the sense of being trapped inside the online world because of the cyclical nature of her online use. Farrah talks about how she *'didn't really have anybody else to turn to'* in the above quote, which suggests she has a lack of emotional support. I wondered what it was that made Farrah feel she could not talk to others about the distressing thoughts and feelings she was experiencing, instead turning to the online world for support. Farrah lived at home with her family, so she had people around her. I wonder if she was concerned about burdening family members with her problems in light of the fact that members of her immediate family had a diagnosed genetic illness.

Alistair also gives a sense of being caught up in this maintenance cycle of online use when he talks about seeing distressing content online, and how he copes with this by going online:

> *'...the majority of the time on YouTube I'm either feeling amused or er I hesitate to say depressed, but erm it you know like a little bit subdued when it's when you're learning about things like climate change and whatever, which can be on a lot of these documentaries or on social media when every other every other post is something horrific that's happened er in the news or erm like ecological disasters or whatever so it varies widely erm yeah.'*
>
> (Alistair, lines 378-383)

> *'**Alistair:** Yeah, I mean you feel better eventually don't you, feelings come and go so you just kind of put it out of your mind.'*
>
> *'**Interviewer:** Okay, okay. Do you know how you do that? How you put it out of your mind?*
>
> ***Alistair:** Generally it's by fixating on something else, so if there's another aspect of news or there's something even worse or something better or so*

> *there's like a new discovery or anything else pretty much that is interesting that captures my attention, erm yeah. So it kind of it's not an active process of I don't want to think about that anymore, it's more just looking continuing and looking at something else that interests me.'*
>
> (Alistair, lines 399-406).

There is a real sense from Alistair's quote above that he was really trying to escape negative feelings generated by the online world by finding *'anything else'* online that could result in positive emotions. It also sounds like he is going on multiple websites in an attempt to do this. This sense that Alistair is trying to escape adds to this feeling that he is trapped by the online world.

3.3.3.4. Medical school online activity initiates other online use

This subtheme relates to how online activity for medical school initiates other (non-medical school related) online use:

> *'I think yeah, I think a lot of what um can start it is you feel that a lot of the time it feels like you have to check your emails because everything from the uni comes through on email. So then you look at your phone to check your emails and then before you know it you click on something else.'*
>
> (Tom, lines 276-278).

Tom was the only participant to explicitly state that medical school online activity led to other online use. It has been included as a theme because it felt like an important part of Tom's experience and key trigger to his online use (linked to the fact that medical school requires regular access to the online world). I wondered if this experience was true for other participants, but that perhaps because they may do this unconsciously, they were not aware of the connection to their online use.

3.3.4. Feel a sense of belonging and connection

This superordinate theme is related to participants need to feel that they belong to a group and how this is associated with their online use. This includes two subthemes: staying connected to the group(s) I feel I belong; and I want to fit into a group and feel I belong.

3.3.4.1. Staying connected to the group(s) in which I belong

Medical students talked about their need to stay connected to groups that they already felt that they belonged to:

> *'Erm in terms of peer relationships I've made a lot of friends in medicine met loads and loads of new people from different walks of life, erm the key unifying ingredient being we all obviously like science but we also like people so it's been really easy to kind of connect with a lot of different people. I'm living with two of the best friends I made at med school and there are plenty of others just dotted around kind of near where I live.'*
>
> (Alistair, lines 56-60)

> *'…now I mean I know people like all over, so obviously I can't interact with them day-to-day there's so many more people even in Leeds that I just wouldn't be able to chat on day-to-day so I just use them just keep to maintain social relationships I suppose erm share things that I think are funny or just generally update each other on our lives that we wouldn't be able to do otherwise. So the fact that I've got so many more social relations has probably prompted that.'*
>
> (Alistair, lines 270-275)

There was a strong sense of Alistair really feeling he belonged to the medical student community, and keeping connected online was a way to maintain connection with his new friends from the course.

3.3.4.2. I want to fit into a group and feel I belong

There was also a sense from a couple of medical students that their online use was the result of them feeling like they did not fit into a group they feel they ought to belong to, and the online world was used as a means to try to connect with others:

> *'**Interviewer:** Okay. Do you think there's any other reasons that like you said, medics use the online more?*
>
> ***Josie:** Um, yeah, probably other than that our timetables are heavier, and we have more to study for, um, we tend to be like a bit more isolated from other students at the University. So people tend to make quite a lot of like cliques in medicine, which I personally can't stand, but it happens, it's very much the norm, unfortunately. So, um yeah, you don't get to interact with a lot of other students outside of medicine, so I feel like medics kind of use um use their devices more and stuff to also like contact people from home and*

their family and friends because they don't have such an extensive social life at uni, purely because of how busy they are.'

(Josie, lines 627-635).

However, whilst she is trying to stay connected with friends and family back home, Josie also talks about how she does not feel as close to them now she is at medical school:

*'**Interviewer:** I see, okay. And how are you feeling about that that change in the relationships?*

***Josie:** Yeah it is what it is. I think you gotta look at it kind of like the wider picture, cos although I'm not as close with like my friends and family from home, I have met a lot of new people at university and formed like a new strong friendships. So like it always does balance out the end of the day and it's not like I've lost them as friends. It's just this is something I've got to dedicate my time to right now, and you know life life will happen and I can always see them when I do get to go home, hopefully soon.'*

(Josie, lines 157-163)

Josie talks about making new strong friendships (with non-medical students) in the above quote, but it seems that maintaining connection with them is also difficult because of the demands of medical school:

*'**Interviewer:** Okay. Thank you, Josie. So it's linked to the question I just asked you, but I just wanted to ask, do you think medical school affects your relationship with other people, and if so, how?*

***Josie:** Yes, definitely. Um, I think it's a lot harder to maintain friendships because most like, pretty much every single one of my friends is on a course that's maybe in like one, or one-and-a-half, two days a week. So when they're all out doing stuff, I'm missing out on a lot of that because I'm on placement, or I'm studying. I've got lectures back-to-back and that kind of thing so I feel like the pure workload can kind of isolate you from the rest of the students.'*

(Josie, lines 164-170).

There was a strong sense of Josie trying to connect with different groups of people and not fitting in. It seemed the online world was a way for Josie to try to keep connected, particularly via social media (as discussed in her pen portrait and other

sections of the results (e.g. fear of missing out)). I picked-up on a sense of anger (‘*which I personally can't stand*’) and sadness (*‘unfortunately’)* in Josie’s first quote in this section related to her not feeling part of the medical student community, which highlighted to me that Josie wanted to be a part of this group as I perceived her anger to be related to a feeling of rejection by those from different backgrounds to her (based on the quote in her pen portrait related to her perception of other medical students being from more advantaged backgrounds than her). I feel this was particularly difficult for Josie because she was *‘absolutely in love’* with medicine, and to be rejected by the people in the profession that you love felt like a particularly big blow for her.

3.3.5. The offline world is not as appealing as the online world

This superordinate theme refers to reasons medical students give for preferring the online world to the offline world. It consists of three subthemes; outside world has *‘lost a little bit of its mystique’*, online world filling a gap, and need for escapism online.

3.3.5.1. Outside world has *‘lost a little bit of its mystique’*

This subtheme relates to how participants talked about the outdoors not being very appealing. There was a sense that over time, participants felt the online world was more appealing to them than going outside:

Alistair: *‘But the outside world has also lost a little bit of its mystique than from when I was younger, I mean when you’re young any kind of tree can be a castle, any bush can be a fort or anything I suppose, so erm yeah.’*

(Alistair, lines 319-321)

Alistair: *‘…there’s just less to do outside I suppose.’*

(Alistair, line 323)

Interviewer: *‘Okay, would you be able to tell me a bit more about that that feeling trapped?’*

Isabella: *‘I mean, it's more like, yeah, you can go outside, but what would you rather do? Go around the park and come back. To me, and there's just like no*

motivation to go out in the park, I'm like yeah, there's trees, wow, I mean, I've seen trees before, type of thing.'

(Isabella, lines 564-566)

3.3.5.2. Online world filling a gap

There was also a sense that the online world was filling a gap in participants lives:

> *'Um then I will get ready and probably put on a podcast as I walk into uni, wherever that might be that day. And then throughout the day I'll probably be checking emails, probably have a look at Facebook, if there's some downtime, if I'm in a clinic and there's not a patient. Or the doctor goes away or something, probably check my phone there. Then at lunch if I'm not with anyone, then I'll probably go on my phone then as well. Um and then a podcast when I'm walking home.'*
>
> (Tom, lines 268-273).

The online world also appeared to act as a substitute for other offline activities such as reading a book. It seems participant's early experiences of using the online world for activities older generations would have engaged in offline (e.g. reading a book on a commute rather than listening to a podcast), has resulted in increased use of the online world. This is not suggesting that medical students do not engage in such offline activities (e.g. reading physical books) at all, but that they do this less because they have the easily accessible online world as an alternative.

3.3.5.3. Need for escapism online

Participants also talked about using the online world to alleviate boredom:

> *'Yeah I mean if I'm if I'm bored it's kind of my first instinct is to find some entertainment online erm so if I'm bored…'*
>
> (Alistair, lines 370-371)

> *'I think it's mainly just boredom and because if I wasn't sat gaming or I wasn't sat watching TV, I wouldn't really know what else to do with myself, so it's mainly just, the main reason for me is to just kind of pass the time…'*
>
> (Josie, lines 362-364)

> *'Um with gaming I think it's more just like whenever I'm bored like sometimes I just you know I'll pick up the phone. And I'll just like there'll be*

> *no messages and stuff, I don't really have anything else to do, so I'll like just start playing a game.'*
>
> (Farrah, lines 727-730).

As illustrated by the above quotes, this need to use the online world was connected to not feeling they have anything else to do offline. Early socialisation to the online world has meant that participants have gotten used to using the online world to engage in activities such as gaming or YouTube, and as a result used the online world to escape when they were bored with the offline world.

3.4. Impact of the Covid-19 pandemic on medical student's experience of the online world

It was important to consider the impact of the Covid-19 pandemic on the results of this project because the data was collected during the pandemic. Further, the online world was a primary source of communication and activity for a lot of people during the pandemic. This section will provide a summary of the perceived impact from the perspective of medical students using the interview data to inform this discussion.

There was a general sense from the interviews that the pandemic amplified participant experiences of the online world that already existed. For example, some medical students talked about how the online world was their whole world, which felt like an amplification of the 'online world as a lifeforce' theme because the online world was now the go-to place for more things (e.g. online world used to socialise a lot more during the pandemic compared to pre-pandemic):

> *'**Interviewer:** And before the pandemic started, what were your feelings about the online world then?*
>
> ***Grace:** Um it enabled me to keep in touch with people who were a long distance for me. So I liked it for that. I liked the information that I could find um it was a lot easier than going to a library to find things for school and work. But I didn't find it essential in the same way as I do now.'*
>
> (Grace, lines 302-306).

Medical students already thought they used the online world too much before the pandemic, but because it became so essential to them for medical school, social connection, and entertainment, they noticed a big increase in their online use during the pandemic:

> '*And then when we're in a global pandemic, it's just it's like the same it's high the whole day just because you're stuck inside the whole time, there is nothing to do really that's connecting you to the outside world other than using the Internet. So, on the weekend during the pandemic it's massively increased [laughs a little].'*
>
> (Alistair, lines 426-429).

Medical students talked about how they felt more of a need for self-care offline because of the amount of time they were spending on the online world during the pandemic. Whilst the online world (pre-pandemic) was usually used for self-care as a way to cope with the demands of medical school, during the pandemic, medical students talked about how they needed to have more breaks away from the online world because they were on there all day:

> *'Um also if, I feel like another thing is because we spend so much time online at the moment for classes, I'm a lot more enthusiastic about taking breaks from staying on a screen. So whereas when I was in year twelve I'd use my laptop to take a break from school. Now I take a break from my laptop. Yeah.'*
>
> (Emma, 242-245).

There was a stronger sense of medical students viewing the online world in a negative light:

> *'But um in terms of post -Covid um I'd say it had way more of a negative impact because again spending so much more time online that it makes me kind of, what's the word I'm looking for? Oh my mind's gone blank there. [laughs] Um it makes me kind of resent having to spend so much time online, so then I don't really want to, but I've got to kind of thing. So yeah, definitely a negative impact post-Covid.'*
>
> (Josie, lines 558-562)

Whilst the online world was usually used to alleviate boredom, during the pandemic, the online world became boring to some medical students during this period:

> *'**Interviewer:** Yeah. And what has it been like for you you know during the pandemic and that change in your Internet use erm yeah?*
>
> ***Alistair:** Erm, I mean it's been it's been a little it's been boring really. Erm I've kind of got a lot more pent-up energy to use just because I can't, I'm bouncing of the walls basically I can't do anything. Erm, and yeah because because when you're using the Internet you're always just sat there doing nothing not nothing because I'm using the Internet, but physically er I get kind of agitated I suppose, erm yeah.'*
>
> (Alistair, lines 469-475)

> *'But I think it's also the fact that like it becomes such a routine that it becomes somewhat tiring um when you're like sitting there watching a lecture and it's just like a lecture just going on and on and you don't really have a way of interacting with anybody. It's just it's really boring and you know, there have been times where like I've just fallen asleep during a lecture because it's been that boring.'*
>
> (Farrah, lines 646-650).

Increase in the use of the online world for medical school purposes during the pandemic resulted in negative experiences of medical school. Some participants talked about medical school being more stressful than usual because it is online:

> *'**Interviewer:** Yeah, okay. And thinking about when you're online for like University related activity. How are you feeling then?*
>
> ***Josie:** Probably stressed most likely at certain time because as much as they go on and try and tell us, it's not the same as face-to-face teaching in the slightest. Um and yeah, there can be a lot of kind of tech issues and um unorganized management especially and stuff like that. So no one really has a clue what they're doing half the time all just trying to muddle through so it is quite stressful trying to navigate it sometimes, cos even though I'd like to think that I'm quite like tech savvy, you know, grown up in the technological age and all this that and the other, um it's all just a thing of it's something new that we're not used to, so everyone has to learn together again.'*
>
> (Josie, lines 385-393).

As illustrated in Josie's quote above, the stress of medical school being online was related to having to adapt to new ways of using the online world (e.g. online video teaching). There appeared to be a parallel process going on with medical school staff (e.g. tutors) also finding it a challenge to navigate the online world in this way, which appeared to contribute to Josie's feelings of stress. Josie also talked about how despite growing-up in the *'technological age'* and considering herself to be

quite *'tech savvy'*, this was a new way of using the online world for her. I wondered if some the feeling of stress was related to Josie putting pressure on herself to know what to do, and that perhaps she found uncertainty and not knowing difficult and anxiety provoking.

Medical students also talked about how conducting all medical school activity online resulted in it being more difficult to meet other medical students:

> *'Um but um in regards to peer relationships, a lot of the contact I've had is um online through social media and through What's App groups chats and on Facebook and stuff. But nothing really in person. There are a couple of people that I've known who have done medicine, like that I've known previously, who have also come onto the course. So um I guess it's somewhat reassuring knowing that I do know people. But um other than that I haven't really had a chance to I guess like get to really meet up with people, because uni's all been online, so we've not really had a reason to be like on campus. And because I'm living at home and not at accommodation, it's been a lot harder to interact with others.'*
>
> (Farrah, lines 184-192).

There was a sense of loss and disappointment because of this:

> *'**Interviewer:** Okay. And I know you mentioned it's been disappointing you know being on your laptop all day. What other feelings do you have about that? What's it been like doing that?*
>
> ***Emma:** Um disappointing in a manageable way, like it's not, it's not a bad thing. I can cope with it, but it's I think the other issue is like if we were actually in-person teaching, I'd probably get to meet more people who were in my course, so that didn't, that element's quite depressing yeah disappointing. I think that's the main thing to be honest with you, um yeah.'*
>
> (Emma, lines 104-109).

This felt like an increased desire for students to feel a sense of belonging and connection with other medical students because they have not been able to meet them face-face.

3.5. Summary of findings

The results of this study show that participants being socialised to the online world was the main overarching theme contributing to medical student's use of the online world. Transition to medical school life, trapped by the online world, feel a

sense of belonging and connection, and the offline world is not as appealing as the online world were the four superordinate themes identified. Superordinate themes could all be understood in the context of the overarching theme, and some relationships existed between them. The next chapter (discussion) will examine these results in the context of existing psychological theory and literature.

Discussion

The aim of this study was to explore medical student's experience of using the online world in-depth. Whilst previous research in this area has examined problematic Internet use in medical students quantitatively, no studies were found that had explored this qualitatively or in the UK. The research question this study aimed to address was:

How do students at medical school make sense of their use of the online world?

Medical students were selected for this study based on key characteristics identified by the literature: experiencing at least mild Internet addiction; and experiencing at least mild depression, anxiety and/or stress. All medical students were on the MBChB course at the University of Leeds, and aged between 18 and 22 years.

This chapter will provide a summary of the results of the analysis, and examine the results in the context of the literature discussed in the introduction, and any additional literature that may be relevant. Strengths and limitations of the study will be presented, and will include suggestions for future research. Finally, the clinical implications of this study and overall conclusions will be presented.

4.1. Summary of findings

Seven participants took part in this study. The mean age was 19.43 years. Most participants were first- or second-year medical students with the exception of one student who was in his fourth year. Participants were a predominantly white, female and UK student sample. The mean severity scores for depression, anxiety and stress were moderate, severe, and moderate respectively, and mild for Internet addiction (as measured by the IAT). The mean wellbeing score was 46.57, which was below the average for people of the same age, and that of other students. Participants who scored higher on measures of online addiction (i.e. the IAT and SAS-SV), had lower wellbeing scores. This was in line with findings from the study conducted by Cardak (2013) who found that university students with higher rates of Internet addiction had lower scores on wellbeing. Most participant's parents had not studied medicine, and according to past research this makes them more at risk of anxiety and depression (Baldassin et al., 2008; Tabalipa et al., 2015), and as

discussed in the introduction chapter, anxiety and depression has been found to be associated with Internet addiction (e.g. Javaeed et al., 2019). Whilst the sample size of participants in the current study is too small to make generalisations from the quantitative data, these results indicate that the medical students in this study appear to have similar characteristics found to be associated with Internet addiction in some other studies.

Pen portraits (idiographic aspect of IPA) were created to illustrate differences in experiences, and add context to the group analysis results. Individual themes were identified, and then combined to create group themes. Group themes consisted of one overarching theme, and four superordinate themes. These themes (and associated subthemes) are discussed in more detail below in the context of existing theories and wider literature.

4.2. Examination of the results in the context of existing literature

This section presents the overarching theme, superordinate themes and subthemes found following the group IPA analysis. Overarching and superordinate themes are used as the main heading, but all subthemes will also be discussed within each subsection.

4.2.1. Socialisation to the online world

The ‘socialisation to the online world’ overarching theme captured different ways in which participants were socialised to the online world. It included three subthemes. The first, ‘early socialisation to the online world’, related to how participants were introduced to the online world at an early age, how this early use was usually for education and hobbies, and how participants viewed their online use to be related to the digital age their generation were a part of and living in. The ‘online world as a lifeforce’ subtheme related to how participants viewed the online world as a go to place for everything, and their belief that should the Internet not exist, it would be *‘dystopian’*. The final subtheme, ‘ease of access to the online world’, related to how easy participants found it to access the online world (e.g. via multiple devices). ‘Socialisation to the online world’ was identified as an

overarching theme because it appeared to be a predisposing factor to the development of the four superordinate themes.

Davis' (2001) cognitive-behavioural model of pathological Internet use proposes psychopathology is viewed as a vulnerability factor (but not a causal factor) of pathological Internet use. The mean severity of depression and anxiety in participants in this study was moderate and severe respectively, suggesting this group of individuals had existing psychopathology and were therefore more vulnerable to pathological Internet use. However, it is not known if psychopathology predates pathological Internet use. There was also evidence of psychopathology from the interview data (e.g. Farrah talking extensively about the anxiety she experiences). Davis (2001) proposed that the stress element in this model is the introduction to the Internet or new technology, and that early experiences of the Internet acts as a contributory factor to the development of pathological Internet use. They suggest that when individuals use new Internet experiences or technology, any positive response from its use reinforces future use (engage in activity more frequently to get the same response). This appears to link to the 'socialisation to the online world' overarching theme where medical students talked about their first experiences of the online world (e.g. that they used the Internet from an early age, and used it for education, YouTube, and social media). Most participants talked about their first experience of the online world and/or getting their first online device as being positive (e.g. exciting, happy to have more freedom), and perhaps these positive experiences of the online world reinforced future use. There was some evidence of participants using the online world at medical school in the same way as they did as a child (e.g. Isabella talked about using YouTube to relax when she used to come home from school, and how she still does this now, and Josie continues to engage in her childhood hobby of gaming). However, participants also talked about how they felt that the reason they use the online world was because it was very much part of their generation. This repeated use of the online world, therefore, may be more related to the fact that they have been socialised to using the online world for hobbies or entertainment for example, whereas other generations may have engaged in these activities offline. In addition to this, participants also talked about how they use the online world because it is more appealing to them than the offline world. This appears to also be linked to their generation and being socialised to the

use of the online world for various activities (e.g. socialising with friends, watching YouTube). It seems therefore that use of the online world for medical students is more than operant conditioning, it is also linked to sociocultural factors that have resulted in them becoming socialised to use the online world in particular ways. This seems more line with the theory of compensatory Internet use (Kardefelt-Winther, 2014) (this theory views online use as a coping or compensatory behaviour rather than a compulsive pathological behaviour) because Kardefelt-Winther (2014) acknowledges the ubiquity of the online world, and how the Internet is now embedded in the lives of younger generations. This echoes the experiences of participants in this study as illustrated by the 'socialised to the online world' overarching theme (specifically the *'It's a generational thing'* and 'no Internet would be dystopian' subthemes). In light of this view, Kardefelt-Winther (2014) suggests that rather than Internet use being pathological, it is just part of *'everyday life'* (Kardefelt-Winther, 2014, p.353). This is in contrast to Davis' (2001) model, because whilst it acknowledges healthy Internet use exists (discussed later in this chapter), Davis' (2001) model is predominantly pathological in its view of Internet addiction.

SDT is a theory of personality development, and BPNT is one of six mini theories that make up SDT (Ryan & Deci, 2000, 2019; Ryan et al., 2019). BPNT proposes individuals have three psychological needs they need to meet to achieve optimal functioning and wellbeing: autonomy relates to feeling one has choice and psychological freedom; competency relates to the feeling of mastery and being good at a task; and relatedness relates to the feeling of belonging and connectedness to others (Ryan & Deci, 2000, 2019). Unmet needs have been found to be associated with problematic Internet use (Song et al., 2004; Wong et al., 2015; Young, 1998). Further, Wong et al. (2015) found psychopathology mediated the relationship between unmet psychological needs and Internet addiction. As discussed in the pen portraits, participants talked about medical school being unclear (e.g. Grace referred to it as a *'nebulous cloud of medicine'*). Participants felt that they did not know what was expected of them (e.g. how much depth to learn a subject area in preparation for examinations). This gives a sense of medical student's competency needs not being met because they do not feel they have mastered subjects. Instead there was uncertainty related to learning and knowledge. In the current study, medical students

also talked about how now they are at medical school, they have more independence (e.g. shift from moving away from parents to living independently and more self-directed learning). On the surface therefore, it appears that their autonomy psychological needs are being met. However, it seems from the findings of the current study, that in some ways this freedom and choice was resulting in some distress (e.g. self-directed learning resulted in medical students being confused about what was expected from them). There is also evidence that this resulted in more online use (e.g. 'self-directed learning' and 'day-to-day activities' subthemes under the online world helps with the 'transition to medical school' superordinate theme). It appears that the online world helps facilitate participant's transition to medical school and independence whilst they try to navigate this new-found freedom and adjustment to medical school life. In short, medical students have more autonomy, but also increasing demands, so it may not feel like autonomy to them.

4.2.2. Transition to medical school life

The 'transition to medical school life' superordinate theme included two subthemes. The first, 'online use in response to the demands of medical school', related to how medical students talked about ways in which they used the online world for self-care in response to the demands of medical school (e.g. mindless scrolling on social media or using YouTube to relax). It also covered 'procrastination', which participants appeared to be using to avoid doing medical school related activity. The second subtheme was the 'online world helps with transition to independence', which relates to how participants talked about their use of the online world as part of 'self-directed learning' for medical school (e.g. doing research online), and how they used the online world for 'day-to-day activities' (e.g. shopping, looking for recipes). This superordinate theme also fed back into the 'socialisation to the online world' overarching theme because a lot of medical school activity involved the use of the online world, and because the medical school is within a wider institution (University of Leeds) and profession (medicine), this acted to further socialise participants to using the online world for academic and clinical purposes. It also contributed to medical students feeling 'trapped by the online

world' (this theme is discussed in the next section) because being at medical school increased online use in different ways (as described below).

The general pathological Internet use aspect of Davis' (2001) model refers to individuals using the online world because they have a lack of social support and/or feeling socially isolated. Online use consists of *'wasting time'* and engaging with activity with *'no directive purpose'* (e.g. repeatedly checking messages on social media or emails), and individuals are said to spend *'abnormal amounts of time'* (Davis, 2001, p.192), online doing this. The 'online use for self-care' subtheme (under this 'transition to medical school life' superordinate theme), describes activity related to wasting time (e.g. mindless scrolling). This appeared to be a way for medical students to numb their minds (self-medicate) from the stress of medical school rather than being due to a lack of social support. This made me think of a comment made by Dr Anna Lembke (Medical Director of Addiction Medicine at Stamford University School of Medicine) in 'The Social Dilemma' Netflix documentary (discussed in more detail later) when she states *'social media is a drug'* (Orlowski, 2020). This suggests that social media use is an addictive product, and the Social Networking Sites (SNS) are the suppliers (this is discussed in more detail below). In addition to wasting time on social media to numb themselves from the stress of medical school life, it is possible that participants use the online world in this way because they had a lack of social support (e.g. because they have moved away from home and were adapting to a life of independence). Whilst it seemed that participants reported to be spending a lot of time doing this, it is not clear if their use is an abnormal amount of time, particularly as this duration is not defined by the model.

Davis (2001) also argued that procrastination plays a significant role in the development of general pathological Internet use because putting off responsibilities can result in *'significant difficulties in daily functioning'* (p.192). Procrastination was found to be a reason for medical students using the online world in the current study, and this was in response to the demands of medical school (e.g. avoidance or pleasure-seeking behaviour). However, whilst participants talked about procrastinating when they should be doing more academic work (e.g. Isabella talking about how it can be quite hard to ignore the '*little voice'* of procrastination and Tom talking about using the online world when he should be doing other

things), there was little evidence of procrastination having a significant impact on daily functioning as proposed in Davis (2001). This is illustrated in the quote below from Isabella's interview:

> '*I mean, sometimes I really listen to that little voice because I I do struggle with procrastination quite a lot, I won't lie. But I still find ways to work very efficiently as efficiently as I can.'*
>
> (Lines 529-531).

Isabella also talked about how she still manages to balance the demands of medical school with having leisure time (as discussed in her pen portrait), further illustrating that her functioning is not significantly impaired by procrastination. Like the 'online use for self-care' subtheme, it appears procrastination is more a way of coping with medical school demands (compensatory behaviour) rather than a compulsive pathological behaviour. Hayat, Kojuri, and Amini (2020) conducted a quantitative study examining the role of Internet addiction on academic procrastination in medical students (N = 233). They found a moderate positive correlation (r = 0.39) between Internet addiction (measured by the IAT) and procrastination (i.e. the higher the level of Internet addiction, the higher the level of procrastination) (Hayat et al., 2020), which suggests there is a relationship between the two variables, but it does not tell us anything about causality. Like Davis (2001), Hayat et al. (2020) presents a viewpoint of procrastination being problematic behaviour. However, a qualitative study conducted by Abramowski (2018) found evidence of positive procrastination (e.g. allows students more thinking time and for them to pay more attention to detail). This study was conducted with UK university students generally rather than specifically medical students, but does present an important alternative viewpoint of the positive function of procrastination. It is also important to note that both studies did not focus on online procrastination specifically, but procrastination in a general context. The findings of the current study (and examining these results alongside theoretical models) provides additional information as to the reasons medical students are using the online world in this way, and the impact of this on functioning.

Specific pathological Internet use in Davis' (2001) model relates to the abuse and overuse of the Internet for specific Internet areas such as online gambling or pornography. Davis (2001) proposes that psychopathology already existed prior

to engaging in the specific activity online (e.g. individuals already addicted to gambling or porn offline), and the online world is an alternative way for them to engage in these activities. Davis (2001) argued that general pathological Internet use was more problematic than specific pathological Internet use because it would not be present if the online world did not exist. This may be the case for social media use (e.g. checking messages or wasting time scrolling online), but individuals (e.g. medical students) could procrastinate offline before the Internet existed (e.g. watching television or re-organising the stationery cupboard). This links into the *'It's a very generational thing'* subtheme, and how participants view their online use to be linked to how they have been socialised to the online world. It does not appear therefore, that procrastinating only exists because of the online world. It could be argued however, that procrastination in the context of the results of this study is more akin to specific pathological Internet use (i.e. this is something that could be done offline and medical students have started to do this online because it exists), but I am not sure I would call it an addictive behaviour in the context of the results in this study.

4.2.3. Trapped by the online world

The 'trapped by the online world' superordinate theme includes four subthemes. The first subtheme, 'would feel freer if there was no Internet', is related to how participants feel they would be freer and have more time to do things were the Internet to suddenly not exist. The 'fear of missing out' subtheme relates to how participants used social media a lot because they were worried they may miss something (e.g. repeatedly checking messages from friends, not wanting to miss a social event). The 'maintenance cycle of online use' subtheme related to how participants were trapped by the online world when they used it to alleviate negative feelings (e.g. anxiety) created by their online use. The final subtheme was about how medical school activity initiates other (non-medical school related) online use.

The 'fear of missing out' subtheme seemed to be associated with a need to stay connected to others (typically via social media), and appeared to fit with the engaging in activity with no directive purpose element of the general pathological Internet use aspect of Davis' (2001) model (e.g. use of language such as *'wasting*

time' and *'mindless scrolling'* by participants). However, in contrast to the idea in Davis' (2001) model that wasting time online served no directive purpose, the findings in the current study related to the 'fear of missing out' subtheme, suggest there is a purpose. This was to stay connected and not miss out on important information that could reduce being connected to others (this is one of the ways the 'trapped by the online world' superordinate theme connects to the 'feel a sense of belonging and connection' subtheme described below). It is important to acknowledge that Davis' (2001) model is 20 years old, and that at the time their paper was published, social media use was not something that was prevalent as it is today. Due to this, their model may look quite different now taking into consideration the prevalence of social media use.

More recent research has investigated fear of missing out. Aarif Alutaybi et al. (2019) described the fear of missing out (also known as FoMO in the literature) as:

> *'...a preoccupation with gaining more interaction opportunities and a loss prevention ability when SNS users are offline or unable to connect and communicate on demand.'*
>
> (p.3758).

Aarif Alutaybi et al. (2019) also make reference to a definition of FoMO from the work of Przybylski, Murayama, DeHaan, and Gladwell (2013) which states FoMO is:

> *'...pervasive apprehension that others might be having rewarding experiences from which one is absent, FoMO is characterized by the desire to stay continually connected with what others are doing.'*
>
> (Przybylski et al., 2013, p.1841).

I feel that the 'fear of missing out' subtheme illustrates the experiences described in the above quotes, demonstrating that more recent literature in this area is more aligned with the experiences of FoMO in medical students. Below is a quote from Tom's interview where he talked about his fear of missing events:

> *'...I would feel a bit anxious about missing things, cause I guess it's not just emails that you feel like you have to check. It's also, um you might miss an event on Facebook or something, that you wanted to go to.'*

One area of interest is the role SNS (e.g. Facebook, Instagram, WhatsApp) on FoMO. The power of SNS was the focus of Netflix documentary 'The Social Dilemma' (Orlowski, 2020), which presented a particularly bleak view of social media use. The documentary suggested that SNS use strategies described by one member of the cast as *'addiction and manipulation-based technology'* to keep people engaged in the online world (Orlowski, 2020). These strategies can include grouping (e.g. WhatsApp allowing private groups to be created), conversation (social media sites allowing for messages to be exchanged via social media), and sharing (e.g. allowing people to send and receive photos, text or videos) (Aarif Alutaybi et al., 2019; Aarif Alutaybi, McAlaney, Stefanidis, Phalp, & Ali, 2018; Kietzmann, Hermkens, McCarthy, & Silvestre, 2011). Whereas participants in the current study felt that 'no Internet would be *'dystopian"*, The Social Dilemma documentary presented a view that if we continue to use the online world (particularly social media) in this way, this would be an existential threat to the world (Orlowski, 2020). Whilst the participants in this study were talking about the online world as a whole rather than social media, it did make me wonder how much of this belief is fuelled by strategies used by SNS (e.g. How much are SNS contributing to the socialisation of medical students to social media?). I also thought about the 'fear of missing out' theme generally and how SNS could be contributing to this in medical students. Aarif Alutaybi et al. (2019) used a series of qualitative methods (interviews, diary study and focus groups) to investigate how different types of SNS strategies facilitated FoMO. Different types of FoMO behaviours were identified for each strategy. *'Fear of missing valuable information'* was a FoMO type associated with the grouping SNS strategy (Aarif Alutaybi et al., 2019), which echoed the experience of some participants in the current study (e.g. Tom in the quote mentioned earlier). '*Fear of missing the sense of relatedness'* was also a FoMO type under the grouping strategy (Aarif Alutaybi et al., 2019). It was suggested in The Social Dilemma documentary, that SNS prey on our psychological need deficits (linked to self-determination theory (SDT) (Ryan & Deci, 2000, 2019)) to lure us in and keep us engaged (Orlowski, 2020). The relatedness (feeling of belonging and connectedness need in SDT) psychological need for example, did not appear to be met by some participants in the current study. This is illustrated by the 'feel a sense of belonging and connection' superordinate theme, which is connected

to the ‘trapped by the online world’ superordinate theme because the online world was used to try to connect with others. This could be due to a fear of missing a sense of relatedness, and motivated by deficits in the relatedness psychological need.

Davis (2001) referred to behavioural symptoms of pathological Internet use to describe a set of symptoms they reported to be similar to that of Young (1996). Symptoms included obsessive thoughts about the online world (checking social media and email messages) and this behaviour mirrors the experience of participants as illustrated by the ‘fear of missing out’ subtheme. Other symptoms that appeared to fit with the ‘trapped by the online world’ superordinate theme were reduced impulse control (e.g. also linked to the ‘fear of missing out’ subtheme, particularly participants talking about checking social media accounts as soon as they wake-up); and unable to stop using the Internet (particularly relevant to the ‘fear of missing out’ and ‘maintenance cycle of online use’ subthemes). Davis (2001) argues that less time is spent engaging in offline activities, and when they are experienced they are less enjoyable. I feel the ‘trapped by the online world’ superordinate theme captures this generally, and specifically in the subtheme ‘would feel freer if there was no Internet’. This is because participants talked about how they would have more time to do other things were the Internet not to exist. ‘The offline world is not as appealing as the online world’ superordinate theme (described in more detail below) also appears relevant here, specifically because participants describe feeling the outside world is not as appealing as the online world, and how boredom prompts their online use as a means to escape (offline world less enjoyable). This superordinate theme, therefore, provides more information about why time is less spent engaging in offline activities, building on Davis’ (2001) model. Thinking about being online when offline was another behavioural symptom proposed by Davis (2001). I felt ‘the offline world is not as appealing as the online world’ superordinate theme to provide some evidence of this because participants were talking about the ‘need for escapism online’ (subtheme) and how the ‘outside world has *‘lost a little bit of its mystique’*’. The final two behavioural symptoms were the Internet is their only friend and spending lots of money online (Davis, 2001). There was some evidence of participants using the online world to stay connected and feel they belong (discussed more in the next section). Whilst I found little evidence of them feeling like the Internet was there only friend, this did make me think about

Farrah talking about turning to the online world to alleviate anxiety because she *'didn't really have anybody else to turn to'*. However, I was not sure if this was because she believed the Internet was her only friend or because she did not feel safe talking to her friends or family about her psychological difficulties. There was no evidence of participants spending lots on money online.

4.2.4. Feel a sense of belonging and connection

The third superordinate theme, 'feel a sense of belonging and connection', included two subthemes. The first was related to how participants talked about using the online world to stay connected to group(s) they felt they belonged to, and the second was 'I want to fit into a group and feel I belong'. This superordinate theme connected to participants feeling 'trapped by the online world' because their desire to stay connected with others resulted in them staying engaged with the online world (e.g. social media use related to fear of missing out).

Maladaptive cognitions (unhelpful thoughts or beliefs) were another factor Davis (2001) argued contributed to pathological Internet use. They suggest two main types of all or nothing thinking implicated in pathological Internet use: thoughts about the self (e.g. I feel worthless offline, but I don't online); and thoughts about the world (e.g. the Internet is the only place I can feel respected) (Davis, 2001). Davis (2001) suggests individuals seek out positive non-threatening responses from people online. This made me think about the 'feel a sense of belonging and connection' superordinate theme, and Josie's comments related to cliques at medical school and how she did not feel she had friends from medical school (which she attributed to differences in class). Whilst Josie did not explicitly talk about maladaptive thoughts related to the online and offline world, I wonder if they existed and contributed to her use of social media and the need to feel like she belonged. Davis (2001) also suggests that individuals ruminate about problematic Internet use (e.g. constantly trying to figure out why they are using the Internet so much) and find it hard to be distracted by other life activities. I found little evidence of medical students trying to work out why they use the online world so much in this study. Instead, medical students were able to articulate well the reasons for their online use and/or it was interpreted from discourse in the interviews.

As mentioned earlier under the ‘trapped by the online world’ superordinate theme, the unmet relatedness psychological need contributed to medical students needing to ‘feel a sense of belonging and connection’. The online world was also a place where support for psychological distress was sought (e.g. Farrah using the online world to help alleviate symptoms of anxiety). This online behaviour was in line with the compensatory Internet use model proposed by Kardefelt-Winther (2014) because the online world was used as a coping strategy (compensation viewpoint) rather than being used because of compulsion (more pathological viewpoint). As mentioned earlier, this was a group of medical students who had a mean severity rating of moderate for depression and severe for anxiety. This in addition to these unmet psychological needs, could be contributing to online use (e.g. online use for self-care and procrastination subthemes).

4.2.5. The offline world is not as appealing as the online world

The final superordinate theme, ‘the offline world is not as appealing as the online world’, consisted of three subthemes. The first subtheme, the ‘outside world has *‘lost a little bit of its mystique’*’ refers to participant discourse about how they feel the outside world is not as appealing and this was a reason for using the online world. The subtheme, ‘online world filling a gap’, refers to how participants use the online world to fill a gap in their lives (e.g. when Tom talked about listening to Podcasts on his commute to placement), and how the online world acts as a substitute for offline activities older generations used (e.g. reading a book on a commute). The final subtheme, ‘need for escapism online’, relates to how participants used the online world because they are bored offline. This subtheme related to the ‘feeling trapped by the online world’ superordinate theme because like other themes, it kept participants engaged in the online world. Literature related to this superordinate theme has already been discussed in earlier themes, so will not be repeated again here.

4.3. Impact of the pandemic on findings

Participants found that the Covid-19 pandemic amplified some of their experiences of the online world. Medical students talked about the online world becoming more essential than it was previously because they were using it for a lot more activities (e.g. all medical school activity was online for the first and second years in this study, socialising more online). This increased use of the online world resulted in more negative feelings about it (e.g. online world became boring). Participants felt that they needed to take more breaks from the online world because they were having to use it so much. This resulted in them engaging in more self-care offline.

Shehata and Abdeldaim (2021) conducted a cross-sectional study on Internet addiction in medical students (N = 373) and non-medical students (N = 373) in Egypt during the Covid-19 pandemic, and found that Internet addiction (measured by the IAT) was more severe in medical students (51.7% with severe Internet addiction) than non-medical students (11.3% with severe Internet addiction). In contrast to the findings in the Shehata and Abdeldaim (2021) study, I did not feel what was being experienced by participants in the current study was severe Internet addiction. Instead, it felt like medical students were overwhelmed by the amount of time they were having to spend online, and the offline world was used as a break from this. Participants in the current study had a mean score of mild for Internet addiction on the IAT, which helps contextualise these findings. The Shehata and Abdeldaim (2021) study was conducted in Egypt and the current study in the UK, so cultural differences could contribute to severity levels of Internet addiction. Further, the Shehata and Abdeldaim (2021) was quantitative, so more in-depth information about medical students reasons for being online and their offline activity was not gained.

4.4. Healthy versus problematic Internet use

Whilst Davis' (2001) model is pathological in nature, it does acknowledge that Internet use is on a continuum with healthy Internet use on one end, and pathological use on the other. Davis (2001) defines healthy online use as:

> *'...using the Internet for an expressed purpose in a reasonable amount of time without cognitive or behavioral discomfort. Healthy Internet users can separate Internet communication with real life communication. They employ the Internet as a helpful tool rather than a source of identity.'* (p.193)

They go onto suggest that there is no particular threshold of behaviour or cognitive functioning, and that individuals themselves decide whether they feel their Internet use is problematic. So, to what extent do medical students in the current study consider their Internet use healthy based on Davis' (2001) definition? As illustrated in the various examples in earlier sections of this chapter, there are elements of the findings that appear to be demonstrating pathological Internet use in line with Davis' (2001) model. However, there are also aspects of the findings that appear to fit with what Davis (2001) considers healthy. For example, participants talked about how the online world was used for a variety of activities such as education, information and shopping (as evidenced in the 'online world is a lifeforce' and 'online world helps with the transition to independence' subthemes), which illustrates they are using the online world as a tool (healthy use according to Davis (2001)). With regards to medical student's perceptions of their own online use, most participants felt that they used the Internet too much. However, they also appeared to normalise their online use by stating it was similar to friends, but more than their parents which they attributed to their generational differences (part of the 'early socialisation to the online world' subtheme). The 'trapped by the online world' superordinate theme suggests medical students feel they are spending a lot of time online. There appears to be some ambivalence related to whether or not medical students feel they use the online world too much, and I feel that this reflects the complexity of the issue (that the online world is a part of their generation, so they have to use it, but at the same time there are times where they feel they use it too much (e.g. wasting time on social media)). As discussed in detail earlier, there is also the role of SNS on social media use to consider, particularly related to strategies that facilitate FoMO and thus increased social media use.

As discussed in chapter one, the definition of Internet addiction for the current study was derived from definitions from key scholars in the area (e.g. Young, 1998), and diagnostic tools (i.e. IAT, DSM and ICD-11). To recap, this definition considered Internet addiction to consist of impaired control of and/or

obsession or pre-occupation with one's use of the Internet. Online use is prioritised over other activities, which results in marked distress and/or functional impairment. The results of this study showed some evidence of the characteristics specified in this definition of Internet addiction, and these were predominantly related to the 'trapped by the online world' and 'the offline world is not as appealing as the online world' superordinate themes. With regards to impaired control, the 'fear of missing out' (linked to medical students persistent checking of social media) and 'maintenance cycle of online use' subthemes of the 'trapped by the online world' superordinate theme appeared to demonstrate this characteristic. The 'fear of missing out' subtheme also appeared to illustrate obsessive thoughts medical students were having about the Internet, which seemed to be connected to their desire not to miss important social information. The 'would feel freer if there was no Internet' subtheme under the 'trapped by the online world' superordinate theme appeared to demonstrate how medical students were prioritising online use over other activities. This also felt related to the impaired control characteristic as it appeared medical students wanted to stop using the online world and do other things, but found it difficult to disengage from it. 'The offline world is not as appealing as the online world' superordinate theme also suggested the Internet was prioritised over other (offline) activities. The 'need for escapism online' and 'outside world has *'lost a little bit of its mystique'*' subthemes of 'the offline world is not as appealing as the online world' superordinate theme I felt illustrated a pre-occupation with the online world aspect of Internet addiction as defined by this study. Whilst there was evidence of some distress associated with online use (e.g. Farrah's ruminative thoughts about upsetting information online that resulted in further Internet use), I am not sure whether this would be considered marked distress for her or the other participants in this study. Further, there was little evidence of functional impairment in medical students as a result of their online use. It seems therefore that whilst many of the characteristics of Internet addiction (as defined in this study) have been found to be present in medical students, it is not clear if the consequences of their online use is having significant enough adverse effects on their lives (e.g. social or occupational functioning or distress) to be considered an Internet addiction.

BPNT aspect of SDT proposes that online use is the result of unmet psychological needs, which presents more of a humanistic view of the online world

helping individuals to meet unmet needs. Kardefelt-Winther (2014) compensatory model views use of the online world as a way of coping (compensatory view rather than compulsive and pathological view), which appears to be in line with the 'online use in response to the demands of medical school' subtheme (under the 'transition to medical school life' superordinate theme).

In summary, what this study illustrates is that some problematic aspects relating to medical students online use exist, but there are also aspects that are part of day-to-day life. This makes it feel less psychopathologising in its approach, but that does not mean that some of participant's experiences of the online world are not problematic. Like Davis (2001) suggested, one of the best indicators of whether or not Internet use is problematic is medical students themselves. I think this study illustrates participants ability to communicate how they use the online world and whether they feel it is problematic.

4.5. Reflecting on my perspective of Internet addiction and the impact on this study

Reflecting on the results of this study made me think about my role as a trainee clinical psychologist and my perspective of Internet addiction. I have been trained to formulate people's difficulties. This involves viewing psychological difficulties from the perspective of what has happened to someone (e.g. exploring historic, environmental, and other current factors that could be contributing to the problem), and providing a psychological intervention (e.g. talking therapy) to help with the problem. This is in contrast to a more medically trained mental health professional such as a psychiatrist who may have more of a viewpoint of what's wrong with you, will provide a diagnosis and prescribe medication, which feels more pathological (this is viewed at a very simplistic level for illustrative purposes as I understand that not all psychologists and psychiatrists work in this very black and white way). When I look at the thematic map I see one complex formulation of different sociocultural, systemic, relational, and individual factors contributing to medical students use of the online world. I feel that my understanding of the fact that there can be a range of factors that can contribute to a problem meant that I was more open to including findings from the interviews that may not have seemed pathological. If a psychiatrist with a very pathological approach were to conduct this

study, they may have picked up on other aspects that they tend to focus on in clinical practice, related to more pathological behaviour for example. I feel that examining the results in the context of existing literature was an important part of this study as it allowed me to compare to existing definitions of pathological and non-pathological behaviour to add more balance to the findings.

4.6. Strengths and limitations

4.6.1. Strengths

4.6.1.1. Sample

This study had a number of strengths. Firstly, to my knowledge, this is the first UK Internet addiction study to be conducted with medical students, and the first qualitative study to be conducted in this area. This means important gaps in research have been addressed in this study. Next, the sample size was within the recommendations for a doctoral project as defined by Smith et al. (2009). It also included a *'fairly homogenous'* sample (Smith et al., 2009, p.49) in line with recommendations in Smith et al. (2009). All participants were University of Leeds MBChB students aged between 18 and 22 years. These shared (homogeneous) characteristics being present helped to balance any differences between participants. In addition to this, participants were selected based on key characteristics that were identified in the quantitative literature to be present in medical students with Internet addiction (i.e. be experiencing at least mild Internet addiction and at least mild depression, anxiety and/or stress). This means that the sample in the current study is representative of medical students included in the quantitative research, which means the results could be used to better understand some of the findings from the quantitative research. The IAT was selected as the one of the measures of Internet addiction because this was the most frequently used measure of Internet addiction in quantitative studies, which again allows the results to be more applicable to findings from previous research. An additional measure of Smartphone addiction was also included because it was recognised that some of the IAT questions may not be applicable to medical students, and using a Smartphone measure also acknowledged technological advances in online use that may be more applicable to medical students.

4.6.1.2. Recruitment and analysis

Participants in this study were screened to check they met inclusion criteria for the study before being invited to take part in an interview. One of my supervisors (Dr Bewick) screened participants for eligibility using data obtained from an online survey. This was to prevent me from seeing participant scores before the interview, thus reducing bias in my questioning. I did not get access to participant scores on the measures until after I had conducted the IPA analysis of participant data to further reduce the risk of bias at the analysis stage. The process of analysis has been made transparent (e.g. Table 4), which helps increase trust in results and allows for a similar method to be replicated in future studies. I also had regular supervision sessions with my thesis supervisors where quality and validity checks of themes were conducted. These checks involved the discussion of themes at different points of the analysis (via supervision), and me obtaining my supervisors views on whether or not they felt I had captured the essence of the theme (e.g. presenting quotations from interviews and my interpretations of this data). Themes were continually revised until analysis was complete.

4.6.1.3. Results

The thematic map included in this thesis illustrates all themes identified as well as the relationships between them (including a narrative of these relationships). I feel this illustration helps to see the big picture and all the factors involved in the online use of medical students, and illustrates the hermeneutical aspect of IPA (interpreting the part in the context of the whole and vice versa) (Smith et al., 2009). I feel discussing the findings in the context of different psychological theories of Internet addiction as well as other literature, really helped with developing an understanding of the different aspects of medical student's online use and factors that can be contributing to this. I feel the inclusion of demographic information and quantitative measure scores of Internet addiction, mental health and wellbeing helped to contextualise the sample. Finally, this study also considered the impact of the pandemic on medical student's use of the online world, which was important because the online world became a bigger part of most people's lives during the pandemic.

4.6.1.4. Qualities of good qualitative research

As shown in Table 2 in the methods section, there are a number of qualities suggested by Elliott et al. (1999) and Yardley (2000) to ensure a qualitative research study is of good quality. In conducting this study, most of these qualities have been met and already discussed earlier in this section as strengths of this study (e.g. situating the sample, sensitivity to context, coherence and transparency). In addition to those already mentioned, I feel that I have owned my own perspective by adding my ontological and epistemological position at the start of the methods section, provided at least one or two quotes for each theme, and engaged deeply in the topic. I also feel that the study has impact and importance as illustrated in the clinical implications discussed later.

4.6.2. Limitations

This study also had some limitations. Only medical students meeting criteria for at least mild Internet addiction and depression, anxiety and/or stress were included in this study. Whilst it was important to have these criteria for the reasons mentioned earlier, doing this meant that we are not sure how the online use of the sample of medical students included in the current study compares to those who do not have these experiences (i.e. medical students who do not have at least mild Internet addiction and depression anxiety and/or stress). There was one fourth year included in this study and the rest of the sample were first or second years. Having more medical students in the later years of study may have highlighted more differences between early and late years.

This study was conducted during a global pandemic where people were more reliant on the online world for various activities (e.g. socialising and communication, education, work), so some of the ways medical students use the online world during this period may have affected the results. However, questions were included in the interview to separate out pre-pandemic from pandemic experiences, helping increase clarity for both the participants and myself (e.g. when analysing the results). Further, a summary of the impact of the pandemic was included in the results allowing readers to understand the differences between usual and pandemic online use.

4.6.2.1. Qualities of good qualitative research

Whilst most of the qualities of good qualitative research suggested by Elliott et al. (1999) and Yardley (2000) were met in this study, I was not able to meet all the credibility checks suggested by (Elliott et al., 1999). Firstly, several qualitative analysts were not used to check for errors due to not having the resources to do this. This could have meant that some errors or discrepancies may not have been identified. However, two of my supervisors (Dr Gary Latchford and Dr Bridgette Bewick) are experienced qualitative analysts, and checked themes for discrepancies and errors. Member checking with participants was not conducted as this did not fit with IPA methodology due to the interpretative element of the analysis.

4.7. Clinical implications and recommendations

This study has highlighted that multiple factors contribute to medical student's use of the online world. This includes external and internal factors, which can involve every day healthy use, or more problematic use. When assessing for Internet addiction in research or clinical contexts, it is important to take a person-centred approach and to consider the impact of systemic and sociocultural factors (some of which are out of medical student's control) that are contributing to their online use. This means going beyond quantitative measurement and including some form of semi-structured interviewing.

As illustrated by Josie when she talked about how helpful it was to receive support from her tutor in relation to helping her with her work-life balance, it is important that medical schools provide support to students. To help facilitate this, tutors at medical school should be provided with the tools to help support medical students (e.g. understand where to signpost medical students experiencing difficulties, receive training in helpful ways to respond to medical students experiencing difficulties). It was clear from the interviews that most medical students found medical school demands stressful, particularly in relation to not knowing what is expected from them academically. Due to this, it is important that medical schools provide more guidance to medical students in relation to learning (e.g. more clarity on what to learn and in how much depth). The findings of this study suggest that this feeling of not knowing if expectations of the course are being

met continues into later stages of the course as illustrated by Tom's reference to this issue. This suggests that this issue could be more than adjusting to starting medical school. Providing clearer information about academic expectations from the very start of medical school may therefore help medical students feel more confident and reduce stress from the start and in later years. This may also result in medical students feeling less inclined to turn to the online world in response to this uncertainty.

As mentioned earlier, medical students in this study had a mean level of severity of moderate for depression, severe for anxiety and moderate for stress. Despite this, the only medical student to speak openly about her mental health difficulties was Farrah who talked about the anxiety she experiences, the role of the online world on anxiety (mainly social media), and how she uses the online world to help with this. Like Farrah, Josie's levels of depression, anxiety and stress were extremely severe across all these psychological difficulties. Despite the fact that Josie scored higher than Farrah in all areas (maximum scores for depression, anxiety, and stress) she did not talk specifically about mental health difficulties. However, Josie did talk about other areas that appeared to be difficult for her including pushing herself academically and not having a good work-life balance, the existence of a long-term condition that she has had since childhood, and not feeling like she fits-in with other medical students because of her class. Josie was someone who talked about using social media a lot and it seemed that this was related to her need to self-medicate to reduce stress, and to get a feeling of belonging and connection. These could be viewed as other indicators that medical students could be experiencing mental health difficulties and/or finding it difficult to manage the demands of medical school. Elton (2018) found that history of personal and/or family illness could negatively impact on medical students training experience and have a long-term impact on medical students in qualified life. Josie had a long-term physical health condition and Farrah had illness in her family, so it is possible this could make them more vulnerable to mental health difficulties and problematic Internet use. In light of this, it is important that medical schools ensure students have access to support for mental health difficulties (e.g. clinical psychology or counselling services) or at the very least a wellbeing service that can help support medical students get the help they need. Medical schools should aim to develop a

culture that allows medical students to feel safe to discuss psychological difficulties, and reduce stigma around mental health (stigmatising views about mental health problems have been found to be present in the profession (Brower, 2021; Elton, 2018)). This will contribute to medical students feeling safe to seek help for such difficulties (it is possible other participants did not discuss mental health difficulties in the interviews because of this stigma). To facilitate this support, procedures should be put in place to help identify medical students who could be more at-risk of psychological difficulties (e.g. those experiencing mental or physical health difficulties or from disadvantaged backgrounds), and associated Internet addiction. Any psychotherapeutic interventions should take into consideration online use, particularly the use and impact of social media platforms.

The role SNS have on excessive and unhelpful social media use has been highlighted in the literature and in popular culture (e.g. Netflix documentary), and there was evidence of this impacting on medical student's use of the online world. A review of SNS ethical policies should be carried out in relation to the strategies they use to engage people in the online world. Researchers have suggested some FoMO countermeasures that can be provided by SNS and applied by individuals or groups themselves, which include: filtering (only showing information of interest to the individual); event recording (events are recorded whilst the individual is offline to be watched later); or auto-reply (informs people an individual is not available and therefore is not able to reply straight away) (Aarif Alutaybi et al., 2019; Aarif Alutaybi et al., 2018). It appears these measures put the onus on individuals to use them, and some people may not be aware that these measures will be useful. Due to this, SNS liaising with researchers and psychologists for example, to identify harmful features and how to reduce harmful effects, is also recommended. Governments should be prepared to introduce legislation to regulate SNS if they do not take sufficient action to change their behaviour or regulate themselves.

Finally, whilst this study was conducted with medical students, the results could be useful in helping to understand online use of people more generally. Medical students are not the only young people to be socialised to the online world. Other individuals of a similar generation (and potentially older and younger generations) will also have been subject to similar early online experiences, and are likely to be impacted in similar ways (e.g. reliance on the online world for

everything, feeling pressured to use social media). The ‘trapped by the online world’ superordinate theme may also be applicable to other populations (with the exception of the ‘medical school online activity initiates other online use’ subtheme), and appeared to be the area where the more pathological psychological theory and definitions of Internet addiction was more relevant. This could have implications for future treatment of problematic Internet use if this is identified as a problem for individuals in other populations.

4.8. Future research

To address the limitations of this study and previous research, some suggestions for future research are presented here. To begin with, longitudinal quantitative research should be conducted on Internet addiction in medical students because most research found in this area is cross-sectional, so causality cannot be inferred. This means that when examining Internet addiction or other experiences such as mental health difficulties in medical students, studies are not following the same medical students over time, so it is not known if these difficulties change in severity at different stages of the course. Longitudinal qualitative studies could also provide important in-depth information about participants’ experiences that would supplement the quantitative findings (perhaps a mixed methods longitudinal study would be the best approach). These studies should be open to all medical students, not just those experiencing mental health problems and Internet addiction. However, when conducting qualitative interviews, selecting participants from different groups (e.g. with and without Internet addiction) can be helpful in comparing results of the two groups. Future studies should consider recruiting medical students from different medical schools in order to establish if there any differences (e.g. regional or cultural differences) in results. Video recording online qualitative interviews would allow for participants body language (in addition to their tone and the words they are using) to be captured. This would allow for a more comprehensive interpretation and therefore analysis of the data. Having more qualitative analysts involved in the checking of themes could also help refine them.

Secondly, any future research should take into consideration the ubiquity of the online world and how socialised we are as a society to using the online world

when conducting research. This is to prevent an overly individualised and pathological view of use of the online world by medical students.

Finally, research investigating the efficacy of psychological and behavioural interventions on reducing both Internet addiction and mental health problems in medical students could be conducted. This intervention could include strategies to help reduce unhelpful online use (e.g. FoMO countermeasures). This study could be conducted as a pilot or feasibility study, and then later developed into a randomised controlled trial.

4.9. Conclusions

This study explored how medical students make sense of their use of the online world. The overarching theme 'socialisation to the online world', highlighted different ways medical students felt they were socialised to the online world for different purposes. I felt this reflected the sociocultural environment medical students were living in (e.g. online world used in education settings, parents introducing participants to the online world from an early age, and social media being seen to be *'ingrained'* into participant's world by society, particularly from adolescence). Whilst participants acknowledged the benefits of the online world, there was also evidence of negative experiences of the online world. This was mainly illustrated in the 'trapped by the online world' superordinate theme where participants talked about feeling they would have more time to do other things if the Internet did not exist, as well as subthemes relating to 'fear of missing out', 'maintenance cycle of online use', and 'medical school activity initiates other online use'. The overarching theme and all other superordinate themes contributed to medical students feeling trapped. SNS FoMO inducing activity was also a potential facilitating factor for medical students feeling trapped inside the online world.

The findings from this study highlight the complexity of Internet addiction, and I feel it helps us better understand and appreciate why Internet addiction is not considered a psychiatric disorder in some countries such as the UK. It is clear from the findings that medical students use the online world as part of day-to-day living and education purposes, but that there are also situations where their online use is more problematic. Examination of the results in the context of existing literature

highlighted areas where medical student's online use appeared to fit with more pathological perspectives (e.g. Davis, 2001), and instances where a more compensatory less pathological perspectives were relevant (Kardefelt-Winther, 2014). The complexity of Internet addiction in medical students needs to be considered when planning future research in this area. Using mixed methods, carefully considering sample characteristics, and investigating the efficacy of interventions are some useful directions for future research.

4.10. Final reflections

My initial reasons for wanting to conduct a qualitative project on Internet addiction in medical students is because I felt that whilst quantitative studies provided a lot of information on prevalence rates and factors associated with Internet addiction, they lacked depth and I believed a qualitative study could help fill this gap. I also wanted to learn more about Internet addiction because it was not an area I knew very much about. I was not sure what I would find because I was quite ambivalent about whether this was an issue for UK medical students because no previous studies were found in a UK sample. This study reminded me of the importance of exploring individual experience in an open way because this allowed participants to talk about their experience and what was important to them, rather than only using a pre-defined set of measures for example. I discovered that there are many different internal, external, and historical factors contributing to online use in medical students, and the picture is complicated.

List of Abbreviations

AICA-S: Assessment for Computer and Internet Addiction-Screener

APA: American Psychiatric Association

BAI: Beck Anxiety Inventory

BDI: Beck Depression Inventory

BPNT: Basic Psychological Needs Theory

DASS-21: Depression Anxiety and Stress Scale (21-items)

DASS-42: Depression Anxiety and Stress Scale (42-items)

DSM-IV: Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition

DSM-V: Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition

FoMO: Fear of missing out

GMC: General Medical Council

HADS: Hospital Anxiety and Depression Scale

IAT: Internet Addiction Test

ICD-11: International Classification of Diseases-11

IPA: Interpretative Phenomenological Analysis

MBChB: Bachelor of Medicine and Surgery

NHS: National Health Service

N-Vivo: N-Vivo 12.6

PHQ-9: Patient Health Questionnaire-9

PIU: Pathological Internet Use Scale

QoL: Quality of Life

SAS-SV: Smartphone Addiction Scale-Short Version

SDT: Self-determination Theory

SES: Service Education Service

SNS: Social Networking Sites

SOMREC: University of Leeds School of Medicine Research Ethics Committee

SPSS: IBM SPSS Statistics 25

UK: United Kingdom

US: United States

WEMWBS: Warwick-Edinburgh Mental Well-being Scale

WHO: World Health Organization

References

Aarseth, E., Bean, A. M., Boonen, H., Colder Carras, M., Coulson, M., Das, D., . . . Van Rooij, A. J. (2016). Scholars' open debate paper on the World Health Organization ICD-11 Gaming Disorder proposal. *Journal of Behavioral Addictions J Behav Addict, 6*(3), 267-270. doi:10.1556/2006.5.2016.088

Abramowski, A. (2018). Is procrastination all that "bad"? A qualitative study of academic procrastination and self-worth in postgraduate university students. *Journal of Prevention & Intervention in the Community, 46*(2), 158-170. doi:10.1080/10852352.2016.1198168

Ahmed, I., Banu, H., Al-Fageer, R., & Al-Suwaidi, R. (2009). Cognitive emotions: Depression and anxiety in medical students and staff. *Journal of Critical Care, 24*(3), e1-e7. doi:10.1016/j.jcrc.2009.06.003

Al-Saadi, H. (2014). Demystifying Ontology and Epistemology in research methods. 1-11. Retrieved from https://d1wqtxts1xzle7.cloudfront.net/46826079/Demystifying_Ontology_and_Epistemology_in_research_methods-with-cover-page-v2.pdf?Expires=1633885350&Signature=HVfD1jllf20S9SOaxF~wikNylEYSTVcQt2kO1dDy3lgp0Ys-o6tn9CPnP6DndDjCSmM3TMP8ka3yLAguVRcDLH92RqW31qTKE4ES7KCSDQkTH18hkKqaWWbD4TwUHH0I-A0TiZaqE1nEbfJBAP1n33QFOSpPykhcLIqmDnNubDE6ry9E1uEdEWtA5VTljASA6p1tAEe0Beo3EWRRXs65So-WN3-zWFYvR1niH65iDt1keHz9-GDyZHbUtOl43jhU-4o2oBRChjyD2l1o9S1Q0QTZKn9VItt0zyL~Kuhf4PsRZUUFXfoCCup4tAiPotacBVqX7EUWaiJMNkeu4ap2hA__&Key-Pair-Id=APKAJLOHF5GGSLRBV4ZA

Alutaybi, A., Arden-Close, E., McAlaney, J., Stefanidis, A., Phalp, K., & Ali, R. (2019, 6-9 Oct. 2019). *How Can Social Networks Design Trigger Fear of Missing Out?* Paper presented at the 2019 IEEE International Conference on Systems, Man and Cybernetics (SMC).

Alutaybi, A., McAlaney, J., Stefanidis, A., Phalp, K., & Ali, R. (2018). *Designing social networks to combat fear of missing out*. Paper presented at the Proceedings of the 32nd International BCS Human Computer Interaction Conference, Belfast, United Kingdom. https://doi.org/10.14236/ewic/HCI2018.80

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders fifth edition DSM-5™*. Arlington: American Psychiatric Association.

Anand, N., Thomas, C., Thomas, C., Jain, P. A., Bhat, A., Bhat, S., . . . Cherian, A. V. (2018). Internet use behaviors, internet addiction and psychological distress among medical college students: A multi centre study from South India. *Asian Journal of Psychiatry, 37*, 71-77. doi:10.1016/j.ajp.2018.07.020

Baldassin, S., Alves, T. C. d. T. F., de Andrade, A. G., & Nogueira Martins, L. A. (2008). The characteristics of depressive symptoms in medical students during medical education and training: a cross-sectional study. *BMC medical education, 8*(1), 60-60. doi:10.1186/1472-6920-8-60

Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university

students. *Social Psychiatry and Psychiatric Epidemiology, 43*(8), 667-672. doi:10.1007/s00127-008-0345-x

Block , J. (2008). Issues for DSM-V: Internet Addiction. *American Journal of Psychiatry, 165*(3), 306-307. doi:10.1176/appi.ajp.2007.07101556

Boonvisudhi, T., & Kuladee, S. (2017). Association between Internet addiction and depression in Thai medical students at Faculty of Medicine, Ramathibodi Hospital. *PloS one, 12*(3), e0174209. doi:10.1371/journal.pone.0174209

Brand, M., Young, K. S., & Laier, C. (2014). Prefrontal Control and Internet Addiction: A Theoretical Model and Review of Neuropsychological and Neuroimaging Findings. *Frontiers in Human Neuroscience, 8*(375). doi:10.3389/fnhum.2014.00375

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. doi:10.1191/1478088706qp063oa

Braun, V., & Clarke, V. (2013). *Successful qualitative research : a practical guide for beginners*. Los Angeles: SAGE.

Brazeau, C. M., Shanafelt, T., Durning, S. J., Massie, F. S., Eacker, A., Moutier, C., . . . Dyrbye, L. N. (2014). Distress among matriculating medical students relative to the general population. *Acad Med, 89*(11), 1520-1525. doi:10.1097/acm.0000000000000482

Brenneisen Mayer, F., Souza Santos, I., Silveira, P. S. P., Itaqui Lopes, M. H., de Souza, A. R. N. D., Campos, E. P., . . . Tempski, P. (2016). Factors associated to depression and anxiety in medical students: a multicenter study. *BMC medical education, 16*(1), 282-282. doi:10.1186/s12909-016-0791-1

Brower, K. J. (2021). Professional Stigma of Mental Health Issues: Physicians Are Both the Cause and Solution. *Academic Medicine, 96*(5). Retrieved from https://journals.lww.com/academicmedicine/Fulltext/2021/05000/Professional_Stigma_of_Mental_Health_Issues_.27.aspx

Bunevicius, A., Katkute, A., & Bunevicius, R. (2008). Symptoms of Anxiety and Depression in Medical Students and in Humanities Students: Relationship With Big-Five Personality Dimensions and Vulnerability To Stress. *International Journal of Social Psychiatry, 54*(6), 494-501. doi:10.1177/0020764008090843

Caplan, S. E. (2002). Problematic Internet use and psychosocial well-being: development of a theory-based cognitive–behavioral measurement instrument. *Computers in Human Behavior, 18*(5), 553-575. doi:https://doi.org/10.1016/S0747-5632(02)00004-3

Cardak, M. (2013). Psychological Well-Being and Internet Addiction among University Students. *Turkish Online Journal of Educational Technology - TOJET, 12*(3), 134.

Chandavarkar, U., Azzam, A., & Mathews, C. A. (2007). Anxiety symptoms and perceived performance in medical students. *Depression and Anxiety, 24*(2), 103-111. doi:10.1002/da.20185

Chaudhari, B., Menon, P., Saldanha, D., Tewari, A., & Bhattacharya, L. (2015). Internet addiction and its determinants among medical students. *Industrial psychiatry journal, 24*(2), 158-162. doi:10.4103/0972-6748.181729

Christakis, D. A., Moreno, M. M., Jelenchick, L., Myaing, M. T., & Zhou, C. (2011). Problematic internet usage in US college students: a pilot study. *BMC Medicine, 9*(1), 77. doi:10.1186/1741-7015-9-77

Compton, M. T., Carrera, J., & Frank, E. (2008). Stress and depressive symptoms/dysphoria among US medical students: results from a large,

nationally representative survey. *J Nerv Ment Dis, 196*(12), 891-897. doi:10.1097/NMD.0b013e3181924d03

Davis, R. A. (2001). A cognitive-behavioral model of pathological Internet use. *Computers in Human Behavior, 17*(2), 187-195. Retrieved from http://www.sciencedirect.com/science/article/pii/S0747563200000418

De Pasquale, C., Sciacca, F., & Hichy, Z. (2017). Italian Validation of Smartphone Addiction Scale Short Version for Adolescents and Young Adults (SAS-SV). *Psychology, 08*(10), 1513-1518. doi:10.4236/psych.2017.810100

DeMarche, E. (2013). Pennsylvania hospital to open country's first inpatient treatment program for Internet addiction. *Fox News*. Retrieved from https://www.foxnews.com/tech/pennsylvania-hospital-to-open-countrys-first-inpatient-treatment-program-for-internet-addiction

Derbyshire, K. L., Lust, K. A., Schreiber, L. R. N., Odlaug, B. L., Christenson, G. A., Golden, D. J., & Grant, J. E. (2013). Problematic Internet use and associated risks in a college sample. *Comprehensive Psychiatry, 54*(5), 415-422.

Dyrbye, L. N., Harper, W., Durning, S. J., Moutier, C., Thomas, M. R., Massie, F. S., . . . Shanafelt, T. D. (2011). Patterns of distress in US medical students. *Medical Teacher, 33*(10), 834-839. doi:10.3109/0142159X.2010.531158

Dyrbye, L. N., Thomas, M. R., Eacker, A., Harper, W., Massie, F. S., Jr., Power, D. V., . . . Shanafelt, T. D. (2007). Race, ethnicity, and medical student well-being in the United States. *Arch Intern Med, 167*(19), 2103-2109. doi:10.1001/archinte.167.19.2103

Dyrbye, L. N., Thomas, M. R., Huntington, J. L., Lawson, K. L., Novotny, P. J., Sloan, J. A., & Shanafelt, T. D. (2006). Personal life events and medical student burnout: a multicenter study. *Acad Med, 81*(4), 374-384. doi:10.1097/00001888-200604000-00010

Dyrbye, L. N., Thomas, M. R., & Shanafelt, T. D. (2006). Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med, 81*(4), 354-373. doi:10.1097/00001888-200604000-00009

Dyrbye, L. N., West, C. P., Satele, D., Boone, S., Tan, L., Sloan, J., & Shanafelt, T. D. (2014). Burnout Among U.S. Medical Students, Residents, and Early Career Physicians Relative to the General U.S. Population. *Academic Medicine, 89*(3), 443-451. doi:10.1097/acm.0000000000000134

Ediz, B., Ozcakir, A., & Bilgel, N. (2017). Depression and anxiety among medical students: Examining scores of the beck depression and anxiety inventory and the depression anxiety and stress scale with student characteristics. *Cogent Psychology, 4*(1). doi:10.1080/23311908.2017.1283829

Eisenberg, D., Gollust, S. E., Golberstein, E., & Hefner, J. L. (2007). Prevalence and Correlates of Depression, Anxiety, and Suicidality Among University Students. *American Journal of Orthopsychiatry, 77*(4), 534-542. doi:10.1037/0002-9432.77.4.534

Elliott, R., Fischer, C. T., & Rennie, D. L. (1999). Evolving guidelines for publication of qualitative research studies in psychology and related fields. *Br J Clin Psychol, 38*(3), 215-229. doi:10.1348/014466599162782

Elton, C. (2018). *Also human: the inner lives of doctors*. London: Windmill Books.

Engward, H. (2013). Understanding grounded theory. *Nursing standard (Royal College of Nursing (Great Britain) : 1987), 28*(7), 37-41. doi:10.7748/ns2013.10.28.7.37.e7806

Fatehi, F., Monajemi, A., Sadeghi, A., Mojtahedzadeh, R., & Mirzazadeh, A. (2016). Quality of Life in Medical Students With Internet Addiction. *Acta Med Iran, 54*(10), 662-666.

Fawzy, M., & Hamed, S. A. (2017). Prevalence of psychological stress, depression and anxiety among medical students in Egypt. *Psychiatry Research, 255*, 186-194. doi:10.1016/j.psychres.2017.05.027

Firth, J. (1986). Levels and sources of stress in medical students. *British Medical Journal (Clinical research ed.), 292*(6529), 1177. doi:10.1136/bmj.292.6529.1177

Ghodasara, S. L., Davidson, M. A., Reich, M. S., Savoie, C. V., & Rodgers, S. M. (2011). Assessing student mental health at the Vanderbilt University School of Medicine. *Acad Med, 86*(1), 116-121. doi:10.1097/ACM.0b013e3181ffb056

Griffiths, M. D. (2010). The Role of Context in Online Gaming Excess and Addiction: Some Case Study Evidence. *International Journal of Mental Health and Addiction, 8*(1), 119-125. doi:10.1007/s11469-009-9229-x

Griffiths, M. D. (2013). Internet addiction in adolescence: Challenges, prevention and intervention. In M. Kim (Ed.), *Saving children from the Internet* (pp. 19-45). Seoul: Kachi Books.

Griffiths, M. D., Kuss, D. J., Billieux, J., & Pontes, H. M. (2016). The evolution of Internet addiction: A global perspective. *Addictive Behaviors, 53*, 193-195. doi:https://doi.org/10.1016/j.addbeh.2015.11.001

Hayat, A. A., Kojuri, J., & Amini, M. (2020). Academic procrastination of medical students: The role of Internet addiction. *Journal of advances in medical education & professionalism, 8*(2), 83-89. doi:10.30476/JAMP.2020.85000.1159

Hill, M. R., Goicochea, S., & Merlo, L. J. (2018). In their own words: stressors facing medical students in the millennial generation. *Medical education online, 23*(1), 1530558-1530558. doi:10.1080/10872981.2018.1530558

Hojat, M., Robeson, M., Damjanov, I., Veloski, J. J., Glaser, K., & Gonnella, J. S. (1993). Students' psychosocial characteristics as predictors of academic performance in medical school. *Acad Med, 68*(8), 635-637. doi:10.1097/00001888-199308000-00015

Iqbal, S., Gupta, S., & Venkatarao, E. (2015). Stress, anxiety and depression among medical undergraduate students and their socio-demographic correlates. *The Indian journal of medical research, 141*(3), 354-357. doi:10.4103/0971-5916.156571

Javaeed, A., Jeelani, R., Gulab, S., & Ghauri, S. K. (2020). Relationship between internet addiction and academic performance of undergraduate medical students of Azad Kashmir. *Pakistan journal of medical sciences, 36*(2), 229-233. doi:10.12669/pjms.36.2.1061

Javaeed, A., Zafar, M. B., Iqbal, M., & Ghauri, S. K. (2019). Correlation between Internet addiction, depression, anxiety and stress among undergraduate medical students in Azad Kashmir. *Pakistan journal of medical sciences, 35*(2), 506. doi:10.12669/pjms.35.2.169

Jelenchick, L. A., Becker, T., & Moreno, M. A. (2012). Assessing the psychometric properties of the Internet Addiction Test (IAT) in US college students. *Psychiatry Research, 196*(2-3), 296-301. doi:10.1016/j.psychres.2011.09.007

Jo, Y. S., Bhang, S. Y., Choi, J. S., Lee, H. K., Lee, S. Y., & Kweon, Y.-S. (2019). Clinical Characteristics of Diagnosis for Internet Gaming Disorder:

Comparison of DSM-5 IGD and ICD-11 GD Diagnosis. *Journal of Clinical Medicine, 8*(7), 945. Retrieved from https://www.mdpi.com/2077-0383/8/7/945

Jun, S., & Choi, E. (2015). Academic stress and Internet addiction from general strain theory framework. *Computers in Human Behavior, 49*, 282-287. doi:https://doi.org/10.1016/j.chb.2015.03.001

Kardefelt-Winther, D. (2014). A conceptual and methodological critique of internet addiction research: Towards a model of compensatory internet use. *Computers in Human Behavior, 31*, 351-354. doi:https://doi.org/10.1016/j.chb.2013.10.059

Kebede, M. A., Anbessie, B., & Ayano, G. (2019). Prevalence and predictors of depression and anxiety among medical students in Addis Ababa, Ethiopia. *International journal of mental health systems, 13*(1), 30-30. doi:10.1186/s13033-019-0287-6

Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Gfroerer, J. C., Hiripi, E., . . . Zaslavsky, A. M. (2003). Screening for Serious Mental Illness in the General Population. *Archives of General Psychiatry, 60*(2), 184-189. doi:10.1001/archpsyc.60.2.184

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). LIfetime prevalence and age-of-onset distributions of dsm-iv disorders in the national comorbidity survey replication. *Archives of General Psychiatry, 62*(6), 593-602. doi:10.1001/archpsyc.62.6.593

Kessler, R. C., Merikangas, K. R., Berglund, P., Eaton, W. W., Koretz, D. S., & Walters, E. E. (2003). Mild Disorders Should Not Be Eliminated From the DSM-V. *Archives of General Psychiatry, 60*(11), 1117-1122. doi:10.1001/archpsyc.60.11.1117

Kietzmann, J. H., Hermkens, K., McCarthy, I. P., & Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business Horizons, 54*(3), 241-251. doi:https://doi.org/10.1016/j.bushor.2011.01.005

Kim-Cohen, J., Caspi, A., Moffitt, T. E., Harrington, H., Milne, B. J., & Poulton, R. (2003). Prior juvenile diagnoses in adults with mental disorder: Developmental follow-back of a prospective-longitudinal cohort. *Archives of General Psychiatry, 60*(7), 709-717. doi:10.1001/archpsyc.60.7.709

Ko, C. H., Yen, J. Y., Chen, C. S., Yeh, Y. C., & Yen, C. F. (2009). Predictive values of psychiatric symptoms for internet addiction in adolescents: a 2-year prospective study. *Arch Pediatr Adolesc Med, 163*(10), 937-943. doi:10.1001/archpediatrics.2009.159

Ko, C. H., Yen, J. Y., Yen, C. F., Lin, H. C., & Yang, M. J. (2007). Factors predictive for incidence and remission of internet addiction in young adolescents: a prospective study. *Cyberpsychol Behav, 10*(4), 545-551. doi:10.1089/cpb.2007.9992

Kumar, B., Shah, M. A. A., Kumari, R., Kumar, A., Kumar, J., & Tahir, A. (2019). Depression, Anxiety, and Stress Among Final-year Medical Students. *Cureus, 11*(3), e4257-e4257. doi:10.7759/cureus.4257

Kuss, D. J., Griffiths, M. D., & Binder, J. F. (2013). Internet addiction in students: Prevalence and risk factors. *Computers in Human Behavior, 29*(3), 959-966.

Kusurkar, R., & Ten Cate, O. (2013). AM Last Page: Education Is Not Filling a Bucket, but Lighting a Fire: Self-Determination Theory and Motivation in

Medical Students. *Academic Medicine, 88*(6), 904. doi:10.1097/ACM.0b013e3182971e06

Kwon, M., Lee, J.-Y., Won, W.-Y., Park, J.-W., Min, J.-A., Hahn, C., . . . Kim, D.-J. (2013). Development and validation of a smartphone addiction scale (SAS). *PloS one, 8*(2), e56936-e56936. doi:10.1371/journal.pone.0056936

Laconi, S., Rodgers, R. F., & Chabrol, H. (2014). The measurement of Internet addiction: A critical review of existing scales and their psychometric properties. *Computers in Human Behavior, 41*, 190-202. Retrieved from http://www.sciencedirect.com/science/article/pii/S0747563214004786

Laidlaw, A. H. (2009). Social anxiety in medical students: Implications for communication skills teaching. *Medical Teacher, 31*(7), 649-654. doi:10.1080/01421590802208867

Lee, J. Y., Park, E. J., Kwon, M., Choi, J. H., Jeong, J. E., Choi, J. S., . . . Kim, D. J. (2014). The Difference in Comorbidities and Behavioral Aspects between Internet Abuse and Internet Dependence in Korean Male Adolescents. *Psychiatry Investig, 11*(4), 387-393. doi:10.4306/pi.2014.11.4.387

Li, W., O'Brien, J. E., Snyder, S. M., & Howard, M. O. (2015). Characteristics of internet addiction/pathological internet use in U.S. university students: a qualitative-method investigation. *PloS one, 10*(2), e0117372-e0117372. doi:10.1371/journal.pone.0117372

Linn, B. S., & Zeppa, R. (1984). Stress in junior medical students: relationship to personality and performance. *J Med Educ, 59*(1), 7-12.

Lopez-Fernandez, O. (2017). Short version of the Smartphone Addiction Scale adapted to Spanish and French: Towards a cross-cultural research in problematic mobile phone use. *Addictive Behaviors, 64*, 275-280. Retrieved from http://www.sciencedirect.com/science/article/pii/S0306460315300642

Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the depression anxiety stress scales* (2nd ed. ed.). Sydney: Psychology Foundation of Australia.

Luk, T. T., Wang, M. P., Shen, C., Wan, A., Chau, P. H., Oliffe, J., . . . Lam, T. H. (2018). Short version of the Smartphone Addiction Scale in Chinese adults: Psychometric properties, sociodemographic, and health behavioral correlates. *Journal of behavioral addictions, 7*(4), 1157-1165. doi:10.1556/2006.7.2018.105

Macaskill, A. (2013). The mental health of university students in the United Kingdom. *British Journal of Guidance & Counselling, 41*(4), 426-441. doi:10.1080/03069885.2012.743110

Mason, J. (2002). *Qualitative researching* (Second edition. ed.). London: Sage.

McManus, S., Meltzer, H., Brugha, T., Bebbington, P., & Jenkins, R. (2009). *Adult psychiatric morbidity in England, 2007: Results of a household survey*. London: National Centre for Social Research.

Mills, D. J., & Allen, J. J. (2020). Self-determination theory, internet gaming disorder, and the mediating role of self-control. *Computers in Human Behavior, 105*, 106209. doi:https://doi.org/10.1016/j.chb.2019.106209

Mosley, T. H., Jr., Perrin, S. G., Neral, S. M., Dubbert, P. M., Grothues, C. A., & Pinto, B. M. (1994). Stress, coping, and well-being among third-year medical students. *Acad Med, 69*(9), 765-767. doi:10.1097/00001888-199409000-00024

Moutinho, I. L. D., Maddalena, N. d. C. P., Roland, R. K., Lucchetti, A. L. G., Tibiriçá, S. H. C., Ezequiel, O. d. S., . . . Universidade Federal de Juiz de Fora, B. (2017). Depression, stress and anxiety in medical students: A cross-

sectional comparison between students from different semesters. *63*(1), 21-28. doi:10.1590/1806-9282.63.01.21

Nechita, F., Nechita, D., Pirlog, M. C., & Rogoveanu, I. (2014). Stress in medical students. *Rom J Morphol Embryol, 55*(3 Suppl), 1263-1266.

Neumann, M., Edelhauser, F., Tauschel, D., Fischer, M. R., Wirtz, M., Woopen, C., . . . Scheffer, C. (2011). Empathy decline and its reasons: a systematic review of studies with medical students and residents. *Acad Med, 86*(8), 996-1009. doi:10.1097/ACM.0b013e318221e615

NHS England. (2019). Children treated for computer gaming addiction under NHS Long Term Plan. Retrieved from https://www.england.nhs.uk/2019/10/children-treated-for-computer-gaming-addiction-under-nhs-long-term-plan/

Niemz, K., Griffiths, M., & Banyard, P. (2005). Prevalence of pathological Internet use among university students and correlations with self-esteem, the General Health Questionnaire (GHQ), and disinhibition. *Cyberpsychol Behav, 8*(6), 562-570. doi:10.1089/cpb.2005.8.562

Orlowski, J. (Writer). (2020). The Social Dilemma. In Exposure Labs, Argent Pictures, & The Space Program (Producer). United States: Netflix.

Park, G. R., & Kim, H. S. (2011). Effects of a Group Counseling Integration Program on Self-determination and Internet Addiction in High School Students with Tendency to Internet Addiction. *jkan, 41*(5), 694-703. doi:10.4040/jkan.2011.41.5.694

Petry, N. M., Rehbein, F., Ko, C. H., & O'Brien, C. P. (2015). Internet Gaming Disorder in the DSM-5. *Curr Psychiatry Rep, 17*(9), 72. doi:10.1007/s11920-015-0610-0

Phillips, T. (2017). 'Electronic heroin': China's boot camps get tough on internet addicts. *The Guardian*. Retrieved from https://www.theguardian.com/world/2017/aug/28/electronic-heroin-china-boot-camps-internet-addicts

Pies, R. (2009). Should DSM-V Designate "Internet Addiction" a Mental Disorder? *Psychiatry (Edgmont (Pa. : Township)), 6*(2), 31-37.

Pontes, H., Kuss, D., & Griffiths, M. (2015). Clinical psychology of Internet addiction: a review of its conceptualization, prevalence, neuronal processes, and implications for treatment. *Neuroscience and Neuroeconomics, 4*, 11-23. doi:10.2147/NAN.S60982

Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior, 29*(4), 1841-1848. doi:https://doi.org/10.1016/j.chb.2013.02.014

Radeef, A. S., & Faisal, G. G. (2018). Prevalence of Internet Addiction and its association with depression, anxiety and stress among Medical Students in Malaysia. *Mediterranean Journal of Clinical Psychology, 6*(3). doi:10.6092/2282-1619/2018.6.1987

Reid, K., Flowers, P., & Larkin, M. (2005). Exploring lived experience. *The Psychologist, 18*(1), 20-23.

Richardson, J. T. E. (1996). *Handbook of qualitative research methods for psychology and the social sciences*. Leicester: British Psychological Society.

Rosal, M. C., Ockene, I. S., Ockene, J. K., Barrett, S. V., Ma, Y., & Hebert, J. R. (1997). A longitudinal study of students' depression at one medical school. *Acad Med, 72*(6), 542-546. doi:10.1097/00001888-199706000-00022

Ryan, R. M., & Deci, E. L. (2000). Self-Determination Theory and the Facilitation of Intrinsic Motivation, Social Development, and Well-Being. *American Psychologist, 55*(1), 68-78. doi:10.1037/0003-066X.55.1.68

Ryan, R. M., & Deci, E. L. (2019). Chapter Four - Brick by Brick: The Origins, Development, and Future of Self-Determination Theory. In A. J. Elliot (Ed.), *Advances in Motivation Science* (Vol. 6, pp. 111-156): Elsevier.

Ryan, R. M., Soenens, B., & Vansteenkiste, M. (2019). Reflections on self-determination theory as an organizing framework for personality psychology: Interfaces, integrations, issues, and unfinished business. *Journal of Personality, 87*(1), 115-145. doi:10.1111/jopy.12440

Shehata, W. M., & Abdeldaim, D. E. (2021). Internet addiction among medical and non-medical students during COVID-19 pandemic, Tanta University, Egypt. *Environmental science and pollution research international*. doi:10.1007/s11356-021-14961-9

Smith, C. K., Peterson, D. F., Degenhardt, B. F., & Johnson, J. C. (2007). Depression, anxiety, and perceived hassles among entering medical students. *Psychol Health Med, 12*(1), 31-39. doi:10.1080/13548500500429387

Smith, J. A., Flowers, P., & Larkin, M. (2009). *Interpretative phenomenological analysis : theory, method and research*. Los Angeles: SAGE.

Song, I., Larose, R., Eastin, M. S., & Lin, C. A. (2004). Internet Gratifications and Internet Addiction: On the Uses and Abuses of New Media. *CyberPsychology & Behavior, 7*(4), 384-394. doi:10.1089/cpb.2004.7.384

Stallman, H. M. (2010). Psychological distress in university students: A comparison with general population data. *Australian Psychologist, 45*(4), 249-257. doi:10.1080/00050067.2010.482109

Starcevic, V. (2013). Is Internet addiction a useful concept? *Australian & New Zealand Journal of Psychiatry, 47*(1), 16-19. doi:10.1177/0004867412461693

Stecker, T. (2004). Well-being in an academic environment. *Med Educ, 38*(5), 465-478. doi:10.1046/j.1365-2929.2004.01812.x

Stewart-Brown, S., & Janmohamed, K. (2008). *Warwick-Edinburgh Mental Well-being Scale (WEMWBS): User Guide Version 1*. Retrieved from Scotland: http://www.mentalhealthpromotion.net/resources/user-guide.pdf

Tabalipa, F. d. O., Souza, M. F. d., Pfützenreuter, G., Lima, V. C., Traebert, E., & Traebert, J. (2015). Prevalence of Anxiety and Depression among Medical Students. *Revista Brasileira de Educação Médica, 39*(3), 388-394. doi:10.1590/1981-52712015v39n3e02662014

Tam, W., Lo, K., & Pacheco, J. (2019). Prevalence of depressive symptoms among medical students: overview of systematic reviews. *Medical Education, 53*(4), 345-354. doi:10.1111/medu.13770

Tan, K.-A. (2019). The Effects of Personal Susceptibility and Social Support on Internet Addiction: an Application of Adler's Theory of Individual Psychology. *International Journal of Mental Health and Addiction, 17*(4), 806-816. doi:10.1007/s11469-018-9871-2

Tebes, J. K. (2005). Community science, philosophy of science, and the practice of research. *Am J Community Psychol, 35*(3-4), 213-230. doi:10.1007/s10464-005-3399-x

TechTarget. (2007). Definition Online. Retrieved from https://searchnetworking.techtarget.com/definition/online

TechTarget. (2019). Definition Internet. Retrieved from https://searchwindevelopment.techtarget.com/definition/Internet

Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., . . . Stewart-Brown, S. (2007). The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): development and UK validation. *Health and Quality of Life Outcomes, 5*(1), 63. doi:10.1186/1477-7525-5-63

The University of Leeds. (2021). Medicine and Surgery MBChB: Course content. Retrieved from https://courses.leeds.ac.uk/5580/medicine-and-surgery-mbchb#section2

Thiemann, P., Brimicombe, J., Benson, J., & Quince, T. (2020). When investigating depression and anxiety in undergraduate medical students timing of assessment is an important factor - a multicentre cross-sectional study. *BMC medical education, 20*(1), 125. doi:10.1186/s12909-020-02029-0

Tikhonov, M., & Bogoslovskii, M. (2015). Internet addiction factors. *Automatic Documentation and Mathematical Linguistics, 49*(3), 96-102. doi:10.3103/S0005105515030073

Tsimtsiou, Z., Haidich, A.-B., Spachos, D., Kokkali, S., Bamidis, P., Dardavesis, T., & Arvanitidou, M. (2015). Internet Addiction in Greek Medical Students: an Online Survey. *Academic Psychiatry, 39*(3), 300-304. doi:10.1007/s40596-014-0273-x

van Rooij, A. J., Schoenmakers, T. M., van de Eijnden, R. J., & van de Mheen, D. (2010). Compulsive Internet use: the role of online gaming and other internet applications. *J Adolesc Health, 47*(1), 51-57. doi:10.1016/j.jadohealth.2009.12.021

Weintraub, P., Dunn, T., Yager, J., & Taintor, Z. (2011). Internet Addiction. In (pp. 407-418).

Willig, C. (2013). *Introducing qualitative research in psychology* (Third edition. ed.). Maidenhead: McGraw-Hill Education.

Wong, T. Y., Yuen, K. S. L., & Li, W. O. (2015). A basic need theory approach to problematic Internet use and the mediating effect of psychological distress. *Frontiers in Psychology, 5*(1562). doi:10.3389/fpsyg.2014.01562

World Health Organization. (2021). *International Classification of Diseases 11th Revision*. Online: World Health Organization Retrieved from https://icd.who.int/browse11/l-m/en

Yardley, L. (2000). Dilemmas in qualitative health research. *Psychology & Health, 15*(2), 215-228. doi:10.1080/08870440008400302

Young, K. S. (1996). Psychology of Computer Use: XL. Addictive Use of the Internet: A Case That Breaks the Stereotype. *Psychological Reports, 79*(3), 899-902. doi:10.2466/pr0.1996.79.3.899

Young, K. S. (1998). Internet Addiction: The Emergence of a New Clinical Disorder. *CyberPsychology & Behavior, 1*(3), 237-244. doi:10.1089/cpb.1998.1.237

Zhang, M. W. B., Lim, R. B. C., Lee, C., & Ho, R. C. M. (2018). Prevalence of Internet Addiction in Medical Students: a Meta-analysis. *Academic Psychiatry, 42*(1), 88-93. doi:10.1007/s40596-017-0794-1

Zhao, L., Lu, Y., Wang, B., & Huang, W. (2011). What makes them happy and curious online? An empirical study on high school students' Internet use from a self-determination theory perspective. *Computers & Education, 56*(2), 346-356. doi:https://doi.org/10.1016/j.compedu.2010.08.006

Zyl, P. v., Joubert, G., Bowen, E., Plooy, F. d., Francis, C., Jadhunandan, S., . . . Metz, L. (2017). Depression anxiety stress and substance use in medical students in a 5year curriculum. *African Journal of Health Professions Education, 9*(2), 67-72. doi:10.7196/AJHPE.2017.v9i2.705

Appendices

5.1. Appendix A: Internet Addiction Test (IAT)

Internet Addiction Test (IAT) by Dr. Kimberly Young.

Internet Addiction Test (IAT) is a reliable and valid measure of addictive use of Internet, developed by Dr. Kimberly Young. It consists of 20 items that measures mild, moderate and severe level of Internet Addiction.

To begin, answer the following questions by using this scale:-

0	Does not apply
1	Rarely
2	Occasionally
3	Frequently
4	Often
5	Always

	Question	Scale					
1	How often do you find that you stay online longer than you intended?	1	2	3	4	5	0
2	How often do you neglect household chores (e.g. washing the dishes, vacuuming) to spend more time on-line?	1	2	3	4	5	0
3	How often do you prefer the excitement of being online to intimacy with your partner?	1	2	3	4	5	0
4	How often do you form new relationships (e.g. friendships, romance, an acquaintance) with fellow online users?	1	2	3	4	5	0
5	How often do others in your life complain to you about the amount of time you spend on-line?	1	2	3	4	5	0
6	How often do your grades or academic studies suffer because of the amount of time you spend online?	1	2	3	4	5	0
7	How often do you check social media (e.g. Facebook, Messenger, WhatsApp, Snapchat, Viber), e-mail online and/or on your phone before doing something else you need to do?	1	2	3	4	5	0
8	How often does your job performance or productivity suffer because of online activity?	1	2	3	4	5	0
9	How often do you become defensive or secretive when anyone asks you what you do online?	1	2	3	4	5	0
10	How often do you block out disturbing thoughts about your life with soothing thoughts related to your activity online?	1	2	3	4	5	0
11	How often do you find yourself anticipating when you will go online again?	1	2	3	4	5	0
12	How often do you fear that life without the online world would be boring, empty, and joyless?	1	2	3	4	5	0
13	How often do you snap, yell, or act annoyed if someone bothers you while you are online?	1	2	3	4	5	0
14	How often does your online activity interfere with your sleep?	1	2	3	4	5	0
15	When offline, how often do you feel preoccupied with the online world, or fantasize about being online?	1	2	3	4	5	0
16	How often do you find yourself saying "just a few more minutes" when online?	1	2	3	4	5	0
17	How often do you try to cut down the amount of time you spend online and fail?	1	2	3	4	5	0
18	How often do you try to hide how long you've been online?	1	2	3	4	5	0
19	How often do you choose to spend more time online over going out with others?	1	2	3	4	5	0
20	How often do you feel depressed, moody or nervous when you are off-line, which goes away once you are back online?	1	2	3	4	5	0

5.2. Appendix B: Topic guide

Topic guide for qualitative interviews

Rapport building and medical school

1. What was it about this project that made you want to take part?

2. What does the online world mean to you?

Follow-up questions

- What do you mean by online?
- How do you access the online world?

3. Can you tell me how you came to be at medical school?

Possible prompts

- When did you decide you wanted to become a doctor?
- What academic route did you take to get here (e.g. A-Levels then medical school, medical sciences course, international student, mature student)?

4. How are you finding medical school?

Possible prompts

- How are you finding the course generally/workload/placements/peer relationships etc.?
- How are you feeling about medical school now you have started?
- How does your experience of being on the course compare to your expectations of the course?
- How would you describe your relationships with others (e.g. at medical school, friends, family) since attending medical school?

5. Do you think medical school affects your relationship with other people? If so, how?

Possible prompts

- Family, friends, partner, peers?
- What's it like when you visit your family and friends?

6. What kind of things help you cope with the demands of medical school?

Online use

7. What are your first memories of your Online use?

   Possible prompts

   - When did you become aware of the Online world?
   - How old were you when you first started using the Internet?
   - How did you feel when you first used the Internet? What did you use it for?
   - What are your memories of your first Online device?
   - What are your first memories of you choosing to go Online? What did you use it for?
   - How did you feel about your Online use back then?

8. Has the way you use the Online world changed over time? And if so, how?

   ### *Possible prompts*

   - How has the way you access the Online world changed over time? Reasons.
   - How has what you are accessing on the Online world changed over time? Reasons.
   - How have the reasons for you accessing the Online world changed over time?
   - What things contribute to/affect:
     - The way you access the Online world?
     - What you access on the Online world?
     - How often and how long you access the Online world?

9. Thinking about a typical day, can you describe how you interact with the Online world?

   ### *Possible prompts*

   - Can you tell me about a recent time you went Online? What were you doing Online? How long? What are your usual reasons for going Online ?
   - How were you feeling whilst Online?
   - Is it the same/different at weekends compared to weekdays? What makes it different? Reasons?

10. Has the current situation (Covid-19) made any difference to your experience or/relationship with the online world?

11. Are there any other activities that you do Online that's not part of what you just described?

12. Suppose you woke up tomorrow morning and there was no Internet. What would that be like?

Possible prompts

- What would you notice?
- How would you feel?
- How would you feel if you broke or lost your phone and were not able to access the Online world for a day?

13. Do you think medical school affects your relationship with the Online world? If so, how?

Possible prompts

- What changes have you noticed in your Online use since starting medical school?
- What are the changes in terms of:
    - The ways Online world is accessed?
    - What is accessed?
    - Reasons for access?

14. What do you think about your Online use?

Possible prompts

- What would a friend/family member say about your Online use?
- How do you think your Online use compares to others?

15. Is there anything else you think is important to tell me that you haven't already?

5.3. Appendix C: Smartphone Addiction Scale-Short Version (SAS-SV)

Smartphone Addiction Scale (SAS: Kwon et al., 2013)

Thinking about your smartphone, please select how much you agree or disagree that each of the statements reflects your own smartphone use.

		Strongly disagree	**Disagree**	**Weakly disagree**	**Weakly agree**	**Agree**	**Strongly agree**
1	Missing planned work due to smartphone use	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
2	Having a hard time concentrating in class, while doing assignments, or while working due to smartphone use	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
3	Feeling pain in the wrists or at the back of the neck while using a smartphone	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
4	Won't be able to stand not having a smartphone	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
5	Feeling impatient and fretful when I am not holding my smartphone	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
6	Having my smartphone in my mind even when I am not using it	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
7	I will never give up using my smartphone even when my daily life is already greatly affected by it.	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
8	Constantly checking my smartphone so as not to miss conversations between other people on Twitter or Facebook	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
9	Using my smartphone longer than I had intended	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree
10	The people around me tell me that I use my smartphone too much.	Strongly disagree	Disagree	Weakly disagree	Weakly agree	Agree	Strongly agree

5.4. Appendix D: Depression Anxiety and Stress Scale (21-items) (DASS-21)

DASS21

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you *over the past week*. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree, or a good part of time
3 Applied to me very much, or most of the time

1	I found it hard to wind down	0	1	2	3
2	I was aware of dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (e.g. in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

5.5. Appendix E: Demographics

Item	Responses
What degree are you currently studying for?	MBChB at University of Leeds Other
What year of study are you in on your current programme? (For example, imagine a three year full-time programme of study. You will answer 1st, 2nd or 3rd year regardless of whether you are enrolled as a full-time or part-time student. It is the year of the programme we are asking about NOT the number of years you have been studying).	1st 2nd 3rd 4th 5th 6th Other (please specify)
What best describes your fee status?	UK/Home student EU student International student
What best describes your student status:	I am a full-time student I am a part-time student
During term-time are you working in paid employment?	No, I am not working in paid employment during term time Yes, I am working in paid employment during term time
During term time, about how many hours a week do you usually spend working on a job for pay?	Less than an hour List 1 to 60 hours More than 60 hours
During term time, do you have regular caring responsibilities?	Yes No
Please select your age (in years):	Drop down listing 17 years or under, then individual years until 99 year or over.
Please select the option that best describes your gender:	Female Male Transgender female Transgender male Gender non-binary Prefer to self-describe/ other Prefer not to say
What best describes your ethnicity?	White - English/Welsh/Scottish/Northern Irish/British White - Irish White - Gypsy or Irish Traveller White - Any other White background, please describe below Mixed/Multiple ethnic groups - White and Black Caribbean Mixed/Multiple ethnic groups - White and Black African Mixed/Multiple ethnic groups - White and Asian Mixed/Multiple ethnic groups - Any other Mixed/Multiple ethnic background, please describe below Asian/Asian British - Indian

	Asian/Asian British - Pakistani Asian/Asian British - Bangladeshi Asian/Asian British - Chinese Asian/Asian British - Any other Asian background, please describe below Black/ African/Caribbean/Black British - African Black/ African/Caribbean/Black British - Caribbean Black/ African/Caribbean/Black British - Any other Black/African/Caribbean background, please describe below Other ethnic group - Arab Other ethnic group - Any other ethnic group, please describe below
How would you describe your sexuality?	Bisexual Heterosexual/ Straight Gay man Gay woman/ Lesbian Prefer to self-describe/ Other Prefer not to say
Do you have a disability?	Blind/partially sighted Deaf/hard of hearing Dyslexia Dyspraxia Dysgraphia Autism spectrum condition (e.g. Asperger syndrome) Mental health difficulties Personal care support Wheelchair user/mobility difficulties Long-term medical condition (e.g. chronic fatigue syndrome, diabetes, epilepsy, cancer, HIV) Other disability Prefer not to say
Did either of your parents graduate from university?	No Yes, both parents Yes, one parent only Don't know
Did you access your current programme of studies via widening participation, widening access, or the contextual admission scheme?	Yes/No
If yes… Which widening participation, widening access or contextual admissions scheme were you involved with?	Access to Leeds Realising opportunities Other (please specify)
Are you involved in the Plus Programme?	Yes Unsure No
What best describes what you were doing the year before starting your current degree?	A Levels BTecs

[although asks for 'best' kept as tick all that apply]	International Baccalaureate Access to Higher Education (HE) Other qualification or formal education Gap year Foundation course (UK) Foundation course (international) Full-time employment Other (please specify)
What best describes where you live during term-time?	University Halls of Residence Private Halls of Residence Private Landlord - flat or house share With parents in the family home Own property Other

5.6. Appendix F: The Warwick-Edinburgh Mental Well-being Scale

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS: Tennant et al., 2007)

Below are some statements about feelings and thoughts.

Please tick the box that best describes your experience of each over the last 2 weeks

STATEMENTS	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling optimistic about the future	1	2	3	4	5
I've been feeling useful	1	2	3	4	5
I've been feeling relaxed	1	2	3	4	5
I've been feeling interested in other people	1	2	3	4	5
I've had energy to spare	1	2	3	4	5
I've been dealing with problems well	1	2	3	4	5
I've been thinking clearly	1	2	3	4	5
I've been feeling good about myself	1	2	3	4	5
I've been feeling close to other people	1	2	3	4	5
I've been feeling confident	1	2	3	4	5
I've been able to make up my own mind about things	1	2	3	4	5
I've been feeling loved	1	2	3	4	5
I've been interested in new things	1	2	3	4	5
I've been feeling cheerful	1	2	3	4	5

"Warwick Edinburgh Mental Well-Being Scale (WEMWBS)
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University of Edinburgh, 2006, all rights reserved."

5.7. Appendix G: Participant information sheet

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MBChB students' use of the online world

Participant Information Sheet

You are being invited to take part in a one-to-one interview being conducted for a University of Leeds postgraduate doctoral research project. Before you decide whether or not you would like to take part, it is important for you to understand why this is being done and what it will involve.

Feel free to ask if there is anything that is not clear or if you would like more information. Thank you for reading this.

What is the purpose of the study?
The aim of this study is to better understand MBChB students' online use. We are interested in the how MBChB students make sense of their use of the online world whilst at medical school. This study aims to learn more about this to enhance knowledge in this area. This knowledge could be used to better support MBChB students in the future.

Why have I been contacted about this study?
You have been contacted because you are a University of Leeds MBChB student who took part in an online survey and consented to be approached about this research.

Do I have to take part?
Participation is voluntary, it is up to you to decide if you want to take part in the study. If you do decide to take part in the interview, you will be asked to give verbal consent before you participate. This verbal consent will be audio recorded. You will be asked to read each statement included in the consent form, and you will indicate your consent by verbalising 'I agree' after each statement. This part of the recording will be stored separately to other study files. Your decision to take part (or not) will not affect your studies on the MBChB.

What will happen to me if I take part?
You will have the opportunity to ask any questions you may have about the study. If you do agree to take part, you will be asked to participate in an interview online (e.g. via Microsoft Teams, Zoom, Skype, telephone). The interviewer will ask questions about your online use. It is estimated that the interview will last around 60 to 90 minutes. The interview will be audio recorded and transcribed for analysis.

What are the possible disadvantages and risks of taking part?
We do not anticipate that there will be any disadvantages or risks of taking part in this study. You do not have to talk about anything that you do not want to and if you feel uncomfortable answering any questions then you do not have to.

What are the possible benefits of taking part?
We hope that meeting up with the researcher and talking about your experience of using the online world will be a positive experience. The information you share will help us to provide students with

better support in the future. You can choose to receive a **£10** Amazon voucher for taking part in the interview.

What will happen if I do not want to carry on with the study?
If you decide to take part in the interview, you are still free to withdraw at any time during the interview and without giving a reason by requesting the interview is stopped. You can choose whether or not you are happy for the researcher to keep any interview data already obtained up to the point of stopping the interview. If after completing the interview you later decide that you would like to withdraw your interview data, you have up to two-weeks after the date you completed the interview to do this by emailing Measha Nickson at ummsb@leeds.ac.uk. You will not be able to withdraw your data if more than two-weeks have passed since you participated in the interview. Your decision to take part (or not) will not affect your studies on the MBChB.

Will my taking part in this study be kept confidential?
All information collected as part of this research including questionnaires and interview recordings will be kept on secure IT systems. Any information from or about you will have any identifying features removed so that you cannot be recognised from it. Any personal identifiable data (e.g. name, email address) will be stored separately from your anonymised data (e.g. interview transcript), and a pseudonymised key will be used to link survey data with interview data. All identifying features will be anonymised after the interview is transcribed. If quotations are used in publications/dissemination activities all quotes will be anonymised (e.g. a pseudonym will be used rather than using your real name). This means that your anonymity will be preserved at all times during and after the study period.

For further information about the University's use of personal data, please see: https://dataprotection.leeds.ac.uk/wp-content/uploads/sites/48/2019/02/Research-Privacy-Notice.pdf.

The only time information about you would be disclosed outside the study is where identified risk is at such a level that it presents a danger to yourself or others. This information will be shared with the most appropriate service(s) (e.g. GP, Police), and we will let you know before we share information in this way.

Where and how long will records be stored?
Electronic data will be stored on a secure University of Leeds drive and will only be accessible to the researchers involved in this project. The paper-based consent form you complete prior to your participation in this semi-structured interview will be scanned and stored on a secure University of Leeds drive. The paper copy will then be destroyed using University of Leeds disposal of confidential waste procedure. Personal identifiable data will be destroyed once primary data analysis has been completed. All anonymised data will be kept for secondary analysis.

What will happen to the results of the research study?
The results of the study will be written up for publication in health professional journals and may be presented at conferences in the UK and abroad.

Who has reviewed the study?
The research has been considered and approved by the School of Medicine Research Ethics Committee (SOMREC ref: MREC 19-068).

Support
If you feel you require support for your mental health, you can contact your GP to book an appointment. You can also contact:

Leeds Services

Leeds University Student Counselling and Well-being service: Complete an online referral form at: https://leeds.onlinesurveys.ac.uk/student-counselling-well-being-service-self-referral-form-2018-19.

Leeds University Nightline: 0113 380 1285 (available 8pm- 8am every night of term including weekends).

Leeds Improving Access to Psychological Therapies: email: leedsiapt@nhs.net, phone: 0113 843 4388.

National Services

NHS Direct: 111 (Free phone).

Samaritans: 116 123 (Free phone and available 24 hours a day, 365 days a year), website: www.samaritans.org.

If you feel you are in crisis and are concerned for the immediate safety of you or those around you, please call 999.

Thank you for reading this. If you would like further information, please contact the Lead Investigator Dr Measha Nickson at ummsb@leeds.ac.uk.

Researchers involved in this project:

Dr Measha Nickson (Postgraduate Doctoral Student)
Tel: 07952 570 667
Email: ummsb@leeds.ac.uk

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Dr Gary Latchford (Supervisor)
Tel: 0113 343 2736
Email: G.Latchford@leeds.ac.uk

Dr Jonathan Darling (Supervisor)
Tel: 0113 343 1926/1922
Email: J.C.Darling@leeds.ac.uk

5.8. Appendix H: Consent form

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Understanding how medical students make sense of their relationship with the Online world

Clinical Psychology Training Programme,
University of Leeds,
School of Medicine,
Level 10, Worsley Building,
Clarendon Way,
Leeds,
LS2 9NL

Consent Form

Please **initial** boxes

1. I confirm that I have read and understand the participant information sheet dated 18/11/2020 (Version 3) for the *'Understanding how MBChB students make sense of their relationship with the Online world'* study and have had the opportunity to have my questions answered. ☐

2. I understand that if I decide to take part in the interview, I am still free to withdraw at any time during the interview and without giving a reason by requesting the interview is stopped. I understand that I can choose whether or not the researcher can keep any interview data already obtained up to the point of stopping the interview. I also understand that if after completing the interview I later decide that I would like to withdraw my interview data, that I can only do this within two-weeks of completing the interview by emailing Measha Nickson at ummsb@leeds.ac.uk. I understand that my decision to take part (or not) will not affect my studies on the MBChB. ☐

3. I give my consent for audio recordings of the semi-structured interview to be made. I understand that this is for the purposes of analysing information I provide in the semi-structured interview and for supervision purposes, that any person hearing the tape will keep the information confidential, and that recordings will be stored under secure conditions. ☐

4. I agree to my anonymous quotations being used for the project thesis and publications. ☐

5. I give consent for my anonymised data to be stored and used in the analysis of this and future research. ☐

6. I agree to take part in this study. ☐

If you understand the information provided and consent to taking part in the study, please sign below.

_____	_____	_____
Name of Participant	Date	Signature
_____	_____	_____
Name of Researcher	Date	Signature

When completed: 1 copy for participant; 1 copy for researcher.