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An Exploration of College Students with Diagnosed Mental Disorder's Use of Everyday Technology

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An Exploration of College Students with Diagnosed Mental Disorder's Use of Everyday Technology

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Master of Science

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by

Matthew Deveau

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CERTIFICATE OF APPROVAL

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This is to certify that the Thesis of

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Abstract

Mental illness affects roughly 1 in 5 college students in the United States and this number is growing according to the National Alliance on Mental Illness (NAMI, n.d.; NAMI, 2012). There is an increased need for ways for people with DMDs to receive help in carrying out their everyday responsibilities and occupations. The college environment can be overwhelming for someone with a diagnosed mental disorder. Smart phones, cell phones, and tablets are technologies that people aged 18-24 utilize on a daily basis, which may offer a suitable resource to help them to manage their diagnosed mental disorder. There currently exists little research in the area of smart phone, cell phone, and tablet technology and how it is used to support college-aged students with DMDs, despite the increasing prevalence of such technologies in our society.

Using an anonymous survey distributed to students on a college campus, the purpose of this study was to explore how college students with DMDs currently use and would like to be using everyday technology such as smartphones, cellphones and tablets to help them navigate their disorder and the cognitive disabilities that oftentimes accompany mental disorders.

The results indicate that college students utilize their smartphones, cellphones, and tablets heavily for functions such as email, social media, and text messaging, and that they would like to be using these technologies to: record voice notes, track medications, manage or track their symptoms, relieve stress, and for health and fitness goals.

Chapter 1
Introduction

According to the National Alliance on Mental Illness (NAMI), the incidence of college students with mental health diagnoses is growing (NAMI, 2012). College is, by definition of the experience, a place where every aspect of a student's life takes place (Hunt & Eisenberg, 2010). Students do not go home to their parents everyday and in some cases are far away from their previously established support system. All college students therefore need to adapt and utilize the new resources available to them in order to assist them with day-to-day activities. For college students with diagnosed mental disorders (DMDs), this process can be challenging, especially given the cognitive disabilities associated with having a DMD. Technology, specifically everyday technology (EDT) such as smartphones, cellphones, and tablets, is becoming an ever-increasing source for such assistance. College students as a whole use technology in the majority of the areas of their lives. An article by Black (2010) even highlights how college students are "dependent upon technology" (p. 94). However, while the heavy use of technology is widely seen as dependence, what about students with DMDs, such as major depressive disorder and anxiety disorders, who rely on technology to get them through the day? What EDT methods are they using to help them navigate their daily routines as well as academic responsibilities?

Mental illness affects roughly 1 in 5 college students in the United States and this number is growing according to the (NAMI, n.d.; NAMI, 2012). There is an increased need for ways that people with DMDs can receive help in carrying out their everyday responsibilities and occupations. The college environment can be overwhelming for someone with a DMD. Smart phones, cell phones, and tablets are technologies that people aged 18-24 utilize on a daily basis, which may offer resources to help them to manage their DMD. Currently little research exists in

the area of smart phone, cell phone, and tablet technology use and how these devices can be used to support college aged students with DMDs; however, the increasing prevalence of such technologies in our society cannot be disputed.

Background

Mental health and college students. According to the National Center for Education Statistics (NCES), as of the fall of 2014, the total number of young adults who will enroll in college in America stood at about 20.4 million (NCES, 2014). A series of papers compiled by the National Institute for Mental Health report that by the age of 14, half of all lifetime mental illnesses begin (National Institute of Mental Health, n.d.). Although an exact figure is not known, estimates by the NAMI report that 1 in 5 college students are currently experiencing a “mental health condition” (NAMI, n.d., p. 1).

Occupational therapy and mental health. Mental health is an ever-changing niche for occupational therapy. Although occupational therapy has long played an active role in the treatment of people with mental health conditions, the constantly changing nature of both mental health practice and the possibility of technology for use in intervention presents possible options for the delivery of occupational therapy services. The American Occupational Therapy Association (AOTA) states in a fact sheet that the purpose of occupational therapy in mental health settings matches with the “10 guiding principles of recovery” (SAMHSA, 2012, p. 1). These ten components include: “person-driven, holistic, peer-support, culture, and respect” (AOTA, 2011, p. 1; SAMHSA 2012, p.1). The fact sheet goes on to state that the field of occupational therapy is "inherently client centered, collaborative, and focused on supporting resiliency, full participation, health promotion, and a wellness lifestyle" (p. 1) which fits in with the 10 components of recovery which include treatment that is: “self-directed, individual and

person centered, holistic" (AOTA, 2011, p. 1). The field of occupational therapy is constantly researching the most effective evidence based methods to be effective in treating those with DMDs. Furthermore, the AOTA states that mental health services can be offered in wide variety of settings by an OTP including both the commonly thought of setting such as hospitals and community mental health facilities. The list also includes settings not commonly thought of where mental health services are provided such as prisons, schools, and the workplace (AOTA, 2013).

It is the responsibility of the OTP to ensure that services are client centered and are meaningful to the client (AOTA, 2011). The services rendered and the methods of those services must be beneficial and meaningful to the client.

For example, OTPs in a young adult mental health setting work with clients on multiple facets of their lives such as skills needed to live independently. These skills are called activities of daily living (ADLs) and instrumental activities of daily living (IADLs), which include, but are not limited to: self care tasks, medication management, cooking, social interactions, financial management, and personal relationships (Hardaker, Halcomb, Griffiths, Bolzan, & Arblaster, 2007; Christian-Edwards, 2004; Eklund, 2002). The cognitive disabilities associated with DMDs, such as issues with memory and attention, are what could most dramatically interfere with a college student's ability to perform and participate in ADLs and IADLs. The ultimate goal of occupational therapy in a mental health setting is to make clients as independent as possible. This being said, there is still little current research published on the effectiveness of occupational therapy's role in the mental health arena in general (Hardaker, et al., 2007).

With the advent of technological advancement across the board, EDT and assistive technology (AT) are becoming an increasing option for occupational therapy intervention for

those with cognitive disabilities as their functionalities increase and applications (apps) and functions are being developed that are increasingly user friendly and in some cases more discreet. As technology advances even further, user's devices have the potential to report on a variety of cognitive processes through different forms of self-report, such as a game like interface, that could then be used to predict and analyze a user's cognitive state (Areàn, Ly, & Andersson, 2016). For people with cognitive disabilities, the ability to more readily and efficiently self-report symptoms to their therapist is key to understanding the best methods to help them manage their cognitive dysfunction.

Research Problem

According to the NAMI, about 20% of adults aged 18-24 have a diagnosable mental illness and more adults who are not seeking services (NAMI. n.d.). Currently, the body of research pertaining to college students with mental health diagnoses is limited. In order to aid those with DMDs in furthering their education, it is crucial that investigators look into the rising concern of mental health crises on college campuses. EDT and AT have been shown to mitigate the cognitive disabilities associated with DMDs in a variety of user groups.

With the rise of mental health diagnoses among college students nationwide, researchers can begin to explore how this population utilizes the vast number of technologies present in their daily lives in order to tailor the use of EDT to provide the most effective, efficient, and accepted forms of intervention for college aged persons with mental health diagnoses.

Research supports the use of EDT and AT for those who have cognitive deficits including people with traumatic brain injury, intellectual disabilities, and autism to name a few (Gentry, Lau, Molinelli, Fallen, & Kriner, 2012; Gentry, Wallace, Kvarfordt, & Bodisch Lynch, 2008). However, the population of people with DMDs has been largely excluded from research in this

area, despite the fact that they may also experience cognitive disabilities as a symptom of their DMD (Gitlow, et al., in press). While research has begun to document specific technologies and techniques being implemented as a whole with those with mental health diagnoses, what technologies specifically are college students using to aid them in day-to-day occupations and how helpful are these technologies?

If specific technologies can be useful and instrumental to college students with mental health diagnoses, further programming and supports can be developed on college campuses to be more accommodating towards incoming students. Students can play an active role in the services supplied by identifying EDT apps and technology they will actually use and find beneficial. For occupational therapy specifically, the results allow for a greater understanding of what college students with DMDs expect out of therapy in terms of technology. The results are a source of education for OTPs as well as college administrators and offices for students with disabilities, regarding what college students value and how they desire to be assisted in regards to their serious mental illness.

Rationale

This study serves to include those with DMDs in this area of research from which they are frequently excluded. People with DMDs can have cognitive disabilities that are symptoms of their mental disorder and since research has shown that EDT and AT can help those with cognitive deficits, it is vital to include them in research that seeks to discover how to provide meaningful interventions through EDT, interventions frequently used by this population.

Purpose of study. The purpose of this study was to gain an understanding about how college students with DMDs currently use and how they would like to use their EDT such as smartphones, cell phones, and tablets in order to successfully navigate and balance the wide

range of responsibilities and roles that college students hold. An anonymous survey design distributed to students on the Ithaca College campus was used to explore how college students with DMDs currently use and would like to be using EDT such as smartphones, cellphones and tablets to help them manage their DMD and the cognitive disabilities that oftentimes accompany them.

Definition of Terms

Activities of daily living (ADLs) and Instrumental activities of daily living (IADLs). College students are living alone or with others their own age so it is crucial for them to be able to effectively participate in the basic daily routines. The Occupational Therapy Practice Framework (OTPF) defines ADLs as those basic activities needed for survival and those activities that involve taking care of one's own body. The main ADLs are: bathing, eating, toileting, dressing, and being able to move effectively around one's home (AOTA, 2014). The OTPF defines IADLs as those that support living within the home. These include, but are not limited to: medication management, shopping, managing finances, meal preparation, home maintenance, and using transportation (AOTA, 2014). For the purposes of this paper, IADLs are going to be the major focus in relation to how technology can aid college students with DMDs.

Diagnosed mental disorder (DMD). No one singular definition exists to describe what a DMD is nor is there consensus regarding which diagnoses would fall under this definition. In general, according to the Mayo Clinic (2015), DMDs are considered to be "disorders that affect your mood, thinking and behavior" (p.1). For the purposes of this study, the focus is on the following DMDs: anorexia nervosa, anxiety disorders, bipolar disorder, borderline personality disorder, bulimia, major depressive disorder, posttraumatic stress disorder, and schizophrenia. It is important to note that while there are a multitude of factors that present barriers for people

with DMDs, the cognitive disabilities associated with being diagnosed with a mental disorder may be the most debilitating barrier. Trivedi (2006) details cognitive deficits as not being able to "pay attention, process information, remember and recall information, respond to information quickly, think critically, plan, organize, solve problems, and initiate speech" (p.10). The college experience frequently encompasses all of these cognitive abilities and not being able to perform them would present complications.

Everyday technology (EDT). Everyday technologies are technologies that are considered highly prevalent devices in society. Devices such as smartphones, cellphones, and tablets now fall under the category of EDT. In the past, the term EDT was reserved for items such as car key fobs, microwaves, telephones, and battery operated devices. In recent years, one only has to look around and observe people walking with their smartphones, cellphones or tablets to realize that these technologies have become prevalent in our society. The varying abilities of smartphones, cellphones, and tablets greatly expands the EDT umbrella, especially given the functions included by the manufacturer on the device such as calendars, alarms, and a way to access the Internet. These apps do not require any further purchase other than the device itself.

Assistive technology (AT). When a person with a disability uses an EDT, the definition can be referred to as AT. According to the Assistive Technology Industry Association (ATIA), "Assistive technology is any item, piece of equipment, software or product system that is used to increase, maintain, or improve the functional capabilities of individuals with disabilities" (ATIA, n.d., p. 1). For the purposes of this research, AT will be discussed in tandem with EDT in the form of smartphone, cellphone, and tablet apps and features that assist college students with DMDs in their everyday occupations. This includes apps that are not necessarily included on the

device when purchased such as relaxation apps, reminder apps for specific events, medication, or daily activities, apps that calm the user using sounds or music, apps that aid in the user's education, and apps that help a person sleep. While specific assistive apps that are approved to cater to specific mental health diagnoses may still be a few years away, there are apps that currently can help people to get through their days with more of a sense of control (AOTA, 2016).

Smartphones. According to the Federal Communications Commission (FCC), a smartphone is a mobile cell phone that features "an HTML browser that allows easy access to the full, open Internet; an operating system that provides a standardized interface and platform for application developers; ...a larger screen size than a traditional handset...and touch screens and/or a QWERTY keypad" (FCC, 2010, p. 79-80).

Applications. An application or app is defined as "a program or piece of software designed and written to fulfill a particular purpose of the user" (Oxford Dictionary, n.d., p. 1). There are apps that come preprogrammed on smartphones, cellphones, and tablets for free use. The majority of apps however are found on app stores with prices ranging from free to upwards of a hundred dollars. Some apps also feature what are called in-app purchases. Apps that feature these in-app purchases may be free to begin with, but give users the option to pay for additional features once the app is downloaded. These can consist of additional features to improve the functionality or to expand the parameters of what actions can be completed with the app or can be the purchasing additional content that does not further the app's function and only serves as increased entertainment factor for the user.

Chapter 2
Review of Literature

College Students and Mental Health

Across the country, the incidence of college students with DMDs is on the rise (Clay, 2013). As technology is emerging as a form of effective health related intervention, it is no surprise that college students, who have grown up in a technologically advanced world, want to use EDT as a "tool of empowerment" (Black, 2010, p. 9). to help them manage their mental disorder. Black (2010) also states that the colleges that succeed on behalf of students with DMDs are those that consider the implications of having students with DMDs and find ways to implement programs that benefit their ability to carry out their daily tasks.

Furthermore, Eisenberg, Golberstein, & Gollust (2007) researched how often college students sought mental health services and the extent to which they utilized and perceived having access to mental health treatment on a college campus. The researchers used a web-based survey entitled the Patient Health Questionnaire, which looks specifically at depression and anxiety. Results from the 2785 participants showed that 37% - 84% of them who had depression or anxiety did not receive services, anywhere. There were a wide variety of reasons why students did not receive treatment such as: a low sense of need for treatment, not being cognizant of options for treatment, being afraid their parents would find out, not being sure treatment will ultimately help them manage their condition, and having a "low socioeconomic background" (Eisenberg, Golberstein, & Gollust, 2007, p. 594, 599). The researchers concluded that even at a school with an abundance of resources, the majority of students who participated in the study and identified as having a mental disorder did not receive treatment for the reasons listed above.

Given that college students in this study stated a variety of reasons why they had not received treatment, can EDT or AT solutions be able to solve these issues? For example, the use of mental health apps could help to keep a student's DMD more confidential.

Gemmill & Peterson (2006) found that college students extensively use cell-phones and the Internet to obtain social support from stress. The researchers focused on the supportive aspect of cellphones and the amount of support students receive by communicating with family and friends through the phone. Is receiving consistent support beneficial in helping college students manage their stress or other mental health condition so that they are able to adequately complete their necessary and meaningful occupations?

A systematic review done by Griffiths, Calear, & Banfield (2009) revealed that the use of Internet support groups (ISGs) were effective in aiding college students who have depression to receive peer-to-peer support. Ultimately, it was found that there was no significant correlation supporting the ISGs ability to help those who have depression regulate their symptoms. Despite the lack of correlation, this systematic review poses important questions. Are there any types of peer-to-peer support systems available for college students that do help with regulation of symptoms and episodes? If so, what are they and how often are they used by current college students with mental health diagnoses?

Everyday Technology and Mental Health

Smartphones, cellphones, and tablets usage is increasing. According to a study by the Pew Research Center, in 2015, 68% of American adults currently use a smartphone and 79% of Americans aged 18-24 uses a smartphone (Anderson, 2015). These statistics coupled with the report by NAMI that roughly 20% of those aged 18-24 has a diagnosed mental health concern equates to a large population that could potentially benefit from smartphone intervention to help

manage their DMD (NAMI, n.d.). The inherent functionality and the apps that can be used on these devices makes their functionality extends to a variety of areas. Clinicians and medical professionals are eager to access these convenient and intuitive technologies for use with their clients and patients (Dennison, Morrison, Conway, & Yardley, 2013).

Multiple studies were conducted to determine the amount of health-oriented apps that exist (Donker, et al., 2013; Mosa, Yoo, & Sheets, 2012). Donker, et al., (2013) identified that, as of 2012, of the 13,600 health related apps on the Apple App store, about 6%, about 816, are geared towards mental health. In a systematic review of research articles on apps for healthcare, Mosa, et al. (2012) found that the majority of apps for mobile devices revolved around disease diagnosis, medication management, and educational healthcare apps. Mosa, et al. (2012) reviewed multiple studies on smartphone apps to discover their range of uses across three groups of people in the healthcare arena: "(1) health-care professionals, (2) medical or nursing students, and (3) patients" (p. 3). These authors found that, in general, smartphone and PDA technologies are being used more and more often across multiple levels of the healthcare field for functions such as literature searching, medical training for the healthcare professionals, and chronic disease management and telemedicine apps for patients. Donker, et al., (2013) and Mosa, et al. (2012) discuss the current limitations of the vast number of healthcare apps that exist currently. According to these researchers, the majority of healthcare apps have either not been proven to have statistically significant outcomes or have not been officially approved or endorsed by recognized agencies such as the United States Food and Drug Administration (FDA), American with Disabilities Act (ADA), or American Psychological Association (APA) to be effective and evidence based tools to help one with their disease, disability, or mental illness.

A study done in Australia by Proudfoot, et al., (2010) investigated how people felt about using mobile technologies for "mental health monitoring and management" (p. 2) specifically for depression, anxiety, and stress. The participants' responses were gathered through an online survey, focus groups, and in person interviews. The researchers found that 76% of participants polled through the online survey would be interested in utilizing their mobile device for mental health purposes such as to "monitor and manage their mood, anxiety, or health" (p. 6).

Similarly, Dennison, et al. (2013) researched the implications of smartphone apps for changing a health behavior in young adults. They report there being "little in depth research on users' (and potential users') experiences and views on a wide range of features and technologies that apps are, or will soon be, capable of" (Dennison, et al., 2013, p. 1). They used focus groups and the questions were geared towards the student and staff's perceptions on smartphone apps as they relate to changing health behaviors in young adults with only some interest in such apps being reported. However, the need to have access to health technology at any given time was regarded as important to the participants of the study. Ultimately, this study showed that young adults are interested in using apps to help them with their behavior changes such as being able to "record and track behavior and goals and the ability to acquire advice and information on-the-go" (Dennison, et al, 2013, p.1).

Research has begun to explore mobile technology as a means to deliver psychological treatment outside of a traditional clinical setting and allow patients to utilize technology as they need it throughout the day to maximize their treatment options instead of being limited to receiving treatment during office visits. Some treatment options include communicating with psychological service providers via text message or through the sending of tailored text messages

by the counseling center to students with mental illness (Heron & Smyth, 2010; Fjeldsoe, Marshall, & Miller, 2009; Nolan, Quinn, & MacCobb, 2011).

Research has also begun to delve into specific functionality of smartphones. A randomized control trial conducted by Hammonds, et al. (2015) investigated whether a smartphone reminder app would help college students with mental health diagnoses remember to take their medication. Fifty-seven students who were currently prescribed medication and who used smartphones on a consistent basis participated in the study. The research study measures monitored medication adherence, health benefits, as well as depression, loneliness, and perceived stress levels throughout the study. The investigators concluded that the reminder app for Android or iPhone was ultimately helpful in reminding the participants to take their medication.

Occupational Therapy and Mental Health

Australian researchers Hardaker, et al. (2007) wrote about the role of occupational therapy with young adults in the mental health setting. Citing two other articles by Christian-Edwards, (2004) and Eklund, (2002), the authors delineate how OTPs can work with adolescents and young adults who experience mental illness. They begin by stating that OTPs in a young adult mental health setting work on multiple areas of the person's life such as ADLs and IADLs. Furthermore they state that the ultimate goal of occupational therapy in a mental health setting is to make the client as independent as they can be. However, the researchers acknowledge that there is little research published on occupational therapy's role in the mental health arena in general. Occupational therapists, according to their findings, are sometimes unsure of their role on the care team when it comes to mental health.

Arbesman & Logsdon (2011) performed a systematic review of articles pertaining to mental health treatment approaches in relation to education and work for adults with serious

mental illness. They specifically wanted to know which approaches for this population had the most positive results and worked well. The authors reference a study by Iannelli & Wilding (2007) that found that those aged 18-24 who are employed increased engagement “in productive occupation strengthened a sense of responsibility, identity, and self-worth” (p. 2). The researchers go on to state the importance of establishing education and work environments for those with mental disorders such as schizophrenia, major depressive disorder, and bipolar disorder in order to increase a person’s sense of self-worth and personal empowerment.

Barrows, (1996) recounts her experience helping young adults who have experienced their first episode of a mental illness. She describes the role of occupational therapy in mental health as helping those with mental health diagnoses when there is an “occupational and social dysfunction” (p. 183).

Oftentimes the reason that OTPs work with those who experience mental illness is because of the cognitive problems that those with mental illness experience. For example, people with mental health issues have the highest incidence of cognitive disabilities in the U.S. (Braddock, 2012). Some examples of cognitive disabilities include: memory problems, attention problems, and difficulty with attention (WebAIM, 2013). Cognitive disabilities also include problems with executive functions such as "meeting novel, unanticipated challenges…staying focused…inhibition, working memory, and cognitive flexibility" (Diamond, 2013, p.1). Experiencing one or more cognitive disabilities can interfere with all aspects of a person's life including but not limited to: self care tasks, social interaction, caregiving for others, as well as employment or education. One of the interventions that OTPs may use with clients who have cognitive disabilities is AT or EDT. For example a study published by Gentry, et al. (2012) reported the use of iPods with adults who have autism as a cognitive-behavioral aid in support of

vocational goals. For the three participants, the vocational goals included: (1) prompting for basic tasks, (2) use of the Clock and Contacts, and Music apps to remind user of job duties and to help to moderate anxiety, and (3) use of a speaking calendar app and speaking story for a non-reading person to help them navigate their daily job requirements.

Everyday Technology and Occupational Therapy

Despite the presence of OTPs in the mental health arena, little research regarding the use of technology was found specifically for the mental health population. Studies that tested specific apps that might be useful for those who have specific diagnoses such as the Personalized Real-Time Intervention for Stabilizing Mood (PRISM) for stabilizing mood through real-time user inputted symptoms, the Mobile Assessment and Therapy for Schizophrenia (MATS) for schizophrenia by utilizing user inputted "psychotic symptom severity, social interactions, and medication adherence" (Depp, et al., 2011, p. 6), the Skills Training and Empowerment Program (STEP) for skills training and empowerment through therapist intervention, and the FOCUS, which is a smartphone system for self-management of schizophrenia (Depp, et al., 2011; Ben-Zeev, et al., 2013) come from the fields of psychiatry and nervous and mental disease study.

In an article titled "Evidence Considerations for Mobile Devices in the Occupational Therapy Process", Erikson (2015) sought to look at the current research regarding the use of mobile devices such as smartphones and tablets in treatment as well as the appropriateness and effectiveness of these devices. This author highlights the need to choose the correct device for the client as well as recognizing a specific need for the client that would constitute the use of a mobile device. She cites the study by Mosa et al. (2012) stating that out of the thousands of health apps available for mobile devices, only 57 have been included in scholarly literature.

Research turned up few studies on the use of smartphones and tablets specifically as treatment alternatives for people with DMD's.

While there is evidence in the literature that mobile health apps have value for those who have mental illness, there is little written in the occupational therapy literature about the use of this technology in mental health settings as well as literature asking clients what they would like to do with EDT to help them manage their mental health issues. In a previous study completed by occupational therapy students in 2015 (Gitlow et. al., in press), the group investigated what people with Serious Mental Illness (SMI) want to do with technology. Overall the study revealed that the majority of respondents have and use EDT. They use EDT primarily for text messaging, voicemail, and email. Moreover the study reports that participants would like to use EDT for voice calling, to monitor their health, for voice notes, and for medication reminders. The age range of respondents in that exploratory study was 24-59 years.

Chapter 3
Methods & Procedures

Research Design

The research design was exploratory and non-experimental (Portney & Watkins, 2015). No control or intervention groups were used and data were collected using anonymous surveys. A convenience sample of college students enrolled at the Ithaca College was used. The target population was students aged 18-24 who have been diagnosed with one of the following mental disorders: anorexia nervosa, anxiety disorders, bipolar disorder, borderline personality disorder, bulimia, major depressive disorder, post-traumatic stress disorder, or schizophrenia. The Everyday Technology Survey was used to collect the results. The Everyday Technology Survey was adapted from The Survey of User Needs (Morris, 2015) with permission from John Morris of the Rehabilitation Engineering Research Center for Wireless Technologies. Ithaca College's Institutional Review Board approved this study, prior to implementation (See Appendix A and B).

Research Questions

What EDT functions are college students with DMDs currently utilizing to help them complete their daily activities?

What EDT functions would college students with DMDs like to be using to help them complete their daily activities?

For which day-to-day activities are college students with DMDs using EDT?

What is the extent to which college students with DMDs are implementing EDT into their lives?

Participants and Selection Method

A convenience sample of students currently enrolled at Ithaca College were recruited to participate in the study. Inclusion criteria were: students aged 18-24 who have been diagnosed with one of the following mental disorders: anorexia nervosa, anxiety disorders, bipolar disorder, borderline personality disorder, bulimia, major depressive disorder, post-traumatic stress disorder, or schizophrenia (See Appendix C).

Measurement tool. The Everyday Technology Survey (See Appendix D) focused on the following: non-identifying demographic information, participant's current usage of EDT, the participant's perceived experience using their current EDT, and the participant's wants for functionality of currently owned EDT. The survey consisted of questions asking about participant's present and desired use of EDT as it pertains to helping them compensate for their DMD. The survey consisted of 22 items.

Procedures. An anonymous survey was distributed to students on the Ithaca College campus. An incentive for participation was offered; the chance to win one of three $50 Amazon.com gift cards. This incentive was optional and the email addresses collected were not affiliated in any way to the responses of the Everyday Technology Survey. The Everyday Technology Survey was distributed through one of two methods: Intercom announcements on two separate occasions as well as through a link to the survey on the Student Accessibility Services (SAS) homepage with the permission of the manager of SAS, Leslie Reid.

Analysis of data. Descriptive statistics were used to analyze the data to determine the gender demographics and the demographics of the identified DMDs of the participants. Further descriptive analysis reported a collection of responses to the question; what are college students

with DMDs using EDT for; and a collection of responses to the question; for what do college students with DMDs want to use EDT?

Study Limitations and Assumptions

One challenging aspect of setting up this study was deciding on the language and diagnoses used to describe the population. Ideally, more diagnoses would have been included and would be clearly defined as part of a smaller category under the larger umbrella of DMDs. There are no uniform definitions across the healthcare fields that encompass the smaller list of conditions that were included in this study. Furthermore, everyone with a DMD uses their own term for their specific condition, as evidenced by the varying write in responses we received for the question asking participants to select their identified mental disorder. These factors may have caused some to not feel comfortable participating, as their specific term they use was not included.

A small sample size hindered some of the survey items, especially those asking participants to write in about their current and desired EDT and EDT functionality. Some of the responses were not applicable or relevant to the question posed, forcing them to be disregarded. The small sample size also limits the generalizability of the results to only those who participated.

The survey questions themselves also posed a limitation. The questions were adapted from The Survey of User Needs. While the demographic, basic EDT usage, and write-in questions provided valuable data relevant to this research thesis, the majority of the others provided little value or information vital to this research project. Future research studies should seek to formulate more write-in type items that directly involve content that will provide maximum input on the topic. Another limitation with the survey items was having participants'

responses to each question be voluntary. Although this approach was used to lower stress levels in the participants and to potentially increase responses, it forced each survey item to be looked at separately and made comparisons between questions difficult.

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Manuscript

Abstract

Mental illness affects roughly 1 in 5 college students in the United States and this number is growing according to the National Alliance on Mental Illness (NAMI, n.d.; NAMI, 2012). There is an increased need for ways for people with DMDs to receive help in carrying out their everyday responsibilities and occupations. The college environment can be overwhelming for someone with a diagnosed mental disorder. Smart phones, cell phones, and tablets are technologies that people aged 18-24 utilize on a daily basis, which may offer a suitable resource to help them to manage their diagnosed mental disorder. There currently exists little research in the area of smart phone, cell phone, and tablet technology and how it is used to support college-aged students with DMDs, despite the increasing prevalence of such technologies in our society.

Using an anonymous survey distributed to students on a college campus, the purpose of this study was to explore how college students with DMDs currently use and would like to be using everyday technology such as smartphones, cellphones and tablets to help them navigate their disorder and the cognitive disabilities that oftentimes accompany mental disorders.

The results indicate that college students utilize their smartphones, cellphones, and tablets heavily for functions such as email, social media, and text messaging, and that they would like to be using these technologies to: record voice notes, track medications, manage or track their symptoms, relieve stress, and for health and fitness goals.

Introduction

According to the National Alliance on Mental Illness (NAMI), the incidence of college students with mental health diagnoses is growing (NAMI, 2012). College is, by definition of the experience, a place where every aspect of a student's life takes place (Hunt & Eisenberg, 2010). Students do not go home to their parents everyday and in some cases are far away from their previously established support system. All college students therefore need to adapt and utilize the new resources available to them in order to assist them with day-to-day activities. For college students with diagnosed mental disorders (DMDs), this process can be challenging, especially given the cognitive disabilities associated with having a DMD. Technology, specifically everyday technology (EDT) such as smartphones, cellphones, and tablets, is becoming an ever-increasing source for such assistance. College students as a whole use technology in the majority of the areas of their lives. An article by Black (2010) even highlights how college students are "dependent upon technology" (p. 94). However, while the heavy use of technology is widely seen as dependence, what about students with DMDs, such as major depressive disorder and anxiety disorders, who rely on technology to get them through the day? What EDT methods are they using to help them navigate their daily routines as well as academic responsibilities?

Students with DMD's on College Campuses: Problems with Navigating the College Experience

Mental illness affects roughly 1 in 5 college students in the United States and this number is growing according to the NAMI (NAMI, n.d.; NAMI, 2012). There is an increased need for ways that people with DMDs can receive help in carrying out their everyday responsibilities and occupations. The college environment can be overwhelming for someone with a DMD. Smart phones, cell phones, and tablets are technologies that people aged 18-24 utilize on a daily basis,

which may offer resources to help them to manage their DMD. There is little research in the area of smart phone, cell phone, and tablet technology use and how it can be used to support college aged students with DMDs, however, research and observation can not dispute the increasing prevalence of such technologies in our society.

A previous study at Ithaca College investigated what people with SMI want to do with technology (Gitlow, et al., in press). Overall the study revealed that the majority of respondents have and use EDT. They use EDT primarily for text messaging, voicemail, and email. Moreover the study reported that participants would like to use EDT for voice calling, to monitor their health, for voice notes, and for medication reminders. The age range of respondents in that exploratory survey was 24-59 years.

Lack of Research

Research supports the use of EDT and AT for those who have cognitive deficits including people with traumatic brain injury, intellectual disabilities, and autism to name a few (Gentry, Lau, Molinelli, Fallen, & Kriner, 2012; Gentry, Wallace, Kvarfordt, & Bodisch Lynch, 2008). However, the population of people with DMDs has been largely excluded from research in this area, despite the fact that they also experience cognitive disabilities as a symptom of their DMD. Furthermore, the ultimate goal of occupational therapy in a mental health setting is to make the client as independent as they can be. This being said, there is still little current research published on the effectiveness of occupational therapy's role in the mental health arena in general (Hardaker, et al., 2007).

Methodology

Ithaca College's Institutional Review Board approved this study, prior to implementation (See Appendix A and B).

Research Design

The research design was exploratory and non-experimental (Portney & Watkins 2015). No control or intervention groups were used and data were collected using anonymous surveys. The Everyday Technology Survey adapted from The Survey of User Needs (Morris, 2015) with permission from John Morris of the Rehabilitation Engineering Research Center for Wireless Technologies. Ithaca College's Institutional Review Board approved this study, prior to implementation.

Research Questions

What EDT functions are college students with DMDs currently utilizing to help them complete their daily activities?

What EDT functions would college students with DMDs like to be using to help them complete their daily activities?

For which day-to-day activities are college students with DMDs using EDT?

What is the extent to which college students with DMDs are implementing EDT into their lives?

Participants and Selection Method

A convenience sample of students currently enrolled at Ithaca College were recruited to participate in the study. Inclusion criteria were: students aged 18-24 who have been diagnosed with one of the following mental disorders: anorexia nervosa, anxiety disorders, bipolar disorder,

borderline personality disorder, bulimia, major depressive disorder, post-traumatic stress disorder, or schizophrenia (See Appendix C).

Measurement tool. The Everyday Technology Survey (See Appendix D) focused on the following: non-identifying demographic information, participant's current usage of EDT, the participant's perceived experience using their current EDT, and the participant's wants for functionality of currently owned EDT. The survey consisted of questions asking about participant's present and desired use of EDT as it pertains to helping them compensate for their DMD. The survey consisted of 22 items.

Procedures. An anonymous survey was distributed to students on the Ithaca College campus. An incentive for participation was offered; the chance to win one of three $50 Amazon.com gift cards. This incentive was optional and the email addresses collected were not affiliated in any way to the responses of the Everyday Technology Survey. The Everyday Technology Survey was distributed through one of two methods: Intercom announcements on two separate occasions as well as through a link to the survey on the Student Accessibility Services (SAS) homepage with the permission of the manager of SAS, Leslie Reid.

Analysis of data. Descriptive statistics were used to analyze the data to determine the gender demographics and the demographics of the identified DMDs of the participants. Further descriptive analysis reported a collection of responses to the question; what are college students with DMDs using EDT for; and a collection of responses to the question; for what do college students with DMDs want to use EDT?

Results

A total of 84 surveys were begun, with 67 being completed. Each question on the survey was optional so the data set for each question varied slightly. In addition, the survey items that allowed participants to choose which questions they answered had a different number of responses based on how participants answered. The results for each survey item varied based on the number of participants that responded to each question.

Participant Demographics

Information regarding demographics, diagnoses, and EDT ownership of the participants can be found in Tables 1, 2, and 3.

Table 1

Demographics

Gender	Participants	%	Age	Participants	%
Female	57	79	18-21	60	88
Male	14	19	22-25	6	4
Other	1	1	25+	3	2
Total (n=72)	72	100	Total (n=69)	69	100

Table 2

Demographics: Diagnosed Mental Disorders

DMD	Participants	%
Anorexia nervosa	4	7
Anxiety disorder	35	64
Bipolar disorder	9	16
Borderline personality disorder	4	7
Bulimia	0	0
Major depressive disorder	20	36
Posttraumatic stress disorder	4	7
Schizophrenia	0	0

Table 3

Everyday Technology Ownership

EDT	Participants	%
Smartphone	63	94
Cellphone	3	4
Tablet	22	3
No device	2	3
Others	1	1
Totals (n=67)	67	100

Note: Each item does not account for participants choosing more than one device. Participants can have combination of 2 or more EDT devices.

Survey item 20 asked participants to mark all functions of EDT they use and would like to be using. Data for the multiple-choice responses for this survey item are displayed in Table 4.

Table 4

Features College Students with DMDs Use and Would Like to Be Using

Feature	I am using this feature	I would like to be using this feature	Participants
Voice calling	63	2	65
Video calling	48	9	57
Text messaging	65	1	66
Email	59	5	64
Web browsing	61	3	64
Navigation	58	5	63
Sending photos and/or videos	62	2	64
Social networking (Facebook, Twitter, Instagram, LinkedIn, etc.)	62	1	63
Watching videos	59	4	63
Listening to music	60	3	63
Playing games	49	6	55
Using voicemail	54	5	59
Recording voice notes or reminders	26	15	41
Calendars/notepad	56	4	60
Contact book	60	2	62

Shopping	40	10	50
Monitoring health and Fitness	29	17	46
Downloading applications (apps)	60	2	62
Remembering to take medication	25	16	41
Helping to relieve stress	35	16	51
Relaxation	39	15	54
Monitoring my symptoms	11	31	42

The final two items on the survey were write-in (See Appendix D). Survey item 21 asked: “What would you like your device(s) to do that it currently cannot do?” A total of 18 participants responded and the responses varied from "better pictures", be able to accommodate their visual needs, "block me from certain internet material", to an app where they could plug in symptoms and side effects and it could give them recommendations for medication that they could ask their doctor about.

Survey item 22 asked, "what device(s) would you like to have and why do you not have this device currently?" Eleven participants answered that they would like a tablet, five answered that they would like a smartphone, and two answered that they would like an updated version of their current device. Out of 24 participants for the item, eleven indicated that money or a lack of funds were the primary reasons for not being able to get the device they wanted. Five participants indicated that their current device still works, but is outdated or not ideal for their situation. One participant answered: "It's a few years old and isn't working too well anymore."

Participants were asked about a handful of specific features of EDT they currently use and which they would like to use. They identified social networking, texting, web browsing, and

email as the features they used the most and voice notes, medication management, health and fitness, relieve stress, and track symptoms as the features they would like to use.

Discussion

Occupational therapy has shifted its focus in the mental health field over time. The current focus is more on recovery and treating the person as a whole rather than providing treatment for the diagnosis (AOTA, 2013). Furthermore, Arbesman & Logsdon (2011) state that the role "of occupational therapy in mental health is to help people develop the skills and obtain the supports necessary for independent, interdependent, productive living" (p. 243).

Although the current research on utilizing EDT such as smartphones, cellphones, and tablets in occupational therapy practice is limited, research has shown that usage of smartphone, cellphone, and tablet functionality has been useful in helping those with DMDs with a variety of tasks and that both medical professionals and potential clients are open to using EDT for the management of mental health related issues (Nolan, Quinn, & MacCobb, 2011; Dennison, et al., 2013; Proudfoot, et al., 2010).

Demographically, a larger number of women than men participated in the study. While there may be a multitude of reasons for these results, the concept of stigma amongst men with DMDs can point to a reason as to why more men did not participate. Much of this may stem from gender roles which set expectations for men to be tougher and more resistant to feeling depressed or having a mental disorder (Psychology of men, n.d.).

This study set out to explore how college students with DMDs use EDT such as smartphones, cellphones, and tablets in their daily lives and to discover what features they currently use and which they would like to be using. For the question asking about current technology use, as expected, all of the participants owned a smartphone, cellphone, or tablet

given technologies proliferation into society. The responses to survey item 22 offered more insight into what the participants wanted specifically in terms of technology. That a fair number of participants wrote in wanting a tablet raises questions: Do they want a tablet for a specific reason? What are those reasons? Are there functions of a tablet that are more attractive to this population? It was to be expected that the majority cited a shortage of money as the primary reason for why they do not have their desired device or cannot upgrade their current one.

Responses to the question asking about what participants would like their device to do revealed participants would like an app to list out medications that they could recommend to their doctor based on their symptoms raised further questions: Do such apps already exist and would college students with DMDs find them useful? Would psychologists and doctors endorse these apps? Furthermore, when considering the cognitive disabilities that can accompany mental illness, would the cognitive load of some of these apps be overwhelming for someone with a DMD? Are there functions that come for free on the device itself such as the Calendar and Reminder apps that would fill participant's needs that are not as complex as other apps that can be purchased?

Survey item 20 asked participants to identify which features of EDT they currently use and which they would like to use. It was found that the most commonly used features were: social networking, texting, web browsing, and email, all known features to this generation of college students who tend to like to be connected to one another. Participants identified: voice notes, medication management, health and fitness, relieve stress, and manage or track symptoms as the features that they would like to use. Many of the smartphones and tablets that exist today come with these features already integrated and if not, there are apps that exist specifically for these features. Does this population not know about these features on their devices? Does their

DMD or other disability prevent them from accessing them as to use as supports for their DMD? How can these already available and familiar features be used therapeutically?

Study Limitations

One challenging aspect of setting up this study was deciding on the language and diagnoses used to describe the population. Ideally, more diagnoses would have been included and would be clearly defined as part of a smaller category under the larger umbrella of DMDs. There are no uniform definitions across the healthcare fields that encompass the smaller list of conditions that were included in this study. Furthermore, everyone with a DMD uses their own term for their specific condition, as evidenced by the varying write in responses we received for the question asking participants to select their identified mental disorder. These factors may have caused some to not feel comfortable participating, as their specific term they use was not included.

A small sample size hindered some of the survey items, especially those asking participants to write in about their current and desired EDT and EDT functionality. Some of the responses were not applicable or relevant to the question posed, forcing them to be disregarded. The small sample size also limits the generalizability of the results to only those who participated.

The survey questions themselves also posed a limitation. The questions were adapted from The Survey of User Needs. While the demographic, basic EDT usage, and write-in questions provided valuable data relevant to this research thesis, the majority of the others provided little value or information vital to this research project. Future research studies should seek to formulate more write-in type items that directly involve content that will provide maximum input on the topic. Another limitation with the survey items was having participants'

responses to each question be voluntary. Although this approach was used to lower stress levels in the participants and to potentially increase responses, it forced each survey item to be looked at separately and made comparisons between questions difficult.

Implications for Practice

The features that come preprogrammed onto devices may be used as interventions, which can be used by occupational therapy practitioners supporting occupational therapy's role in mental health recovery through “self-directed, individual and person centered, holistic” treatment as stated in the fact sheet by the AOTA (AOTA, 2011, p. 1). The implications of the results of this study for occupational therapy practice are abundant. The population of college students with DMDs is not one that is researched heavily in occupational therapy. This situation may be because this population oftentimes may not see an occupational therapist for their DMD. The results of this study point to multiple areas where EDT can be implemented more frequently to benefit college students with DMDs. Education about current EDT features as well as increased incorporation of EDT into both occupational therapy and psychological sessions can serve to increase educational based mental functioning for those with DMDs. Education on EDT can also serve to improve a student’s ability to complete their daily routines and be more academically successful. Allowing students to utilize EDT on a trial basis, potentially through a renting program, can serve as a less expensive option for students who, based on the results of this study, indicate cost of EDT devices as being a barrier to accessing the features they would find beneficial. OTPs can assist students with DMDs in researching and providing options for funding for their EDT in addition to finding alternative low-tech solutions.

Future Research Recommendations

Given the results of this study addressing EDT college students are using, which devices they would like to use, and which specific functions they would like to use, future research could focus on why this population desires certain EDT over others. As the study by Proudfoot and colleagues (2010) asked, what are college student's opinions of using their current EDT to help them with their DMD? What does the finding that there are a a multitude of reasons why college students will not seek conventional treatment mean with regard to their use of EDT for DMDs? (Eisenberg, Golberstein, & Gollust, 2007; Eisenberg, Downs, Golberstein, & Zivin, 2009). Similarly, as Nolan, Quinn, & MacCobb (2011) studied, how would the Ithaca College Counseling & Psychological Services (CAPS) employees feel about the implementation of more EDT based treatments? Would a program allowing students and counselors to have correspondence over secure text message be viable at Ithaca College? Such a program would bring with it inherent privacy and monetary implications. A future study could focus on gathering opinions of students and staff about the implementation of such a program.

Conclusion

Occupational therapy as a profession strives to be client-centered and focused on the whole individual. Technology is becoming more and more prevalent in today's society and clients are wanting more and more to have lower-profile ways of helping them cope with their disability, whether physical or mental. EDT such as smartphones, tablets, and cellphones provide numerous ways for clients to thrive in their environments through the use of features on a device they currently own. As with all other settings, the role of an occupational therapist in mental health is to work to provide meaningful interventions to their clients and patients that will allow them to modify their environment or routine so that they may return to their everyday

occupations. Occupational therapists and other professions who treat individuals with DMDs are going to be challenged with the therapeutic use of smartphone and tablet apps to help their clients and patient more easily manipulate the technology they already have, and that they already frequently use. Education on both sides may be necessary to fully understand all that the technology that we consider everyday can do for those looking for technology supports that will make navigating their lives easier.

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Tables

Table 1

Demographics

Gender	Participants	%	Age	Participants	%
Female	57	79	18-21	60	88
Male	14	19	22-25	6	4
Other	1	1	25+	3	2
Total (n=72)	72	100	Total (n=69)	69	100

Table 2

Demographics: Diagnosed Mental Disorders

DMD	Participants	%
Anorexia nervosa	4	7
Anxiety disorder	35	64
Bipolar disorder	9	16
Borderline personality disorder	4	7
Bulimia	0	0
Major depressive disorder	20	36
Posttraumatic stress disorder	4	7
Schizophrenia	0	0

Note:

Table 3

Everyday Technology Ownership

EDT	Participants	%
Smartphone	63	94
Cellphone	3	4
Tablet	22	3
No device	2	3
Others	1	1
Totals (n=67)	67	100

Note: Each item does not account for participants choosing more than one device. Participants can have combination of 2 or more EDT devices.

Table 4

Features College Students with DMDs Use and Would Like to Be Using

Feature	I am using this feature	I would like to be using this feature	Participants
Voice calling	63	2	65
Video calling	48	9	57
Text messaging	65	1	66
Email	59	5	64
Web browsing	61	3	64
Navigation	58	5	63
Sending photos and/or videos	62	2	64
Social networking (Facebook, Twitter, Instagram, LinkedIn, etc.)	62	1	63
Watching videos	59	4	63
Listening to music	60	3	63
Playing games	49	6	55
Using voicemail	54	5	59
Recording voice notes or reminders	26	15	41
Calendars/notepad	56	4	60
Contact book	60	2	62
Shopping	40	10	50
Monitoring health and Fitness	29	17	46
Downloading applications (apps)	60	2	62
Remembering to take medication	25	16	41
Helping to relieve stress	35	16	51
Relaxation	39	15	54
Monitoring my symptoms	11	31	42

Appendices

Appendix A: Institutional Review Board Proposal

ALL-COLLEGE INSTITUTIONAL REVIEW BOARD COVER PAGE

Primary Investigator: Matthew Deveau
Position: Occupational Therapy Graduate Student
Faculty Advisor: Dr. Lynn Gitlow, Ph.D., OTR/L, ATP, FAOTA
Faculty Advisor email: lgitlow@ithaca.edu
Additional Investigator(s)/Committee Members: James Conklin, Associate Professor in Department of Mathematics
Department: Occupational Therapy
School: Health Sciences and Human Performance
Telephone: 781-879-2834
E-Mail: mdeveau1@ithaca.edu
Project Title: Exploration of college students with diagnosed mental disorder's use of everyday technology
Abstract:

Mental illness affects roughly 1 in 5 college students in the United States and this number is growing according to the National Alliance on Mental Health. There is an increased need for ways for people with diagnosed mental disorders to receive help in carrying out their everyday responsibilities and occupations. The college environment can be overwhelming for someone with a diagnosed mental disorder. Smart phones, cell phones, and tablets are technologies that people aged 18-24 utilize on a daily basis, which may offer a suitable resource to help them to manage their diagnosed mental disorder. There currently exists little research in the area of smart phone, cell phone, and tablet technology and how it used to support college aged students with diagnosed mental disorders, however, research and observation can not dispute the increasing prevalence of such technologies in our society. Using an anonymous Qualtrics survey design being distributed to students on the Ithaca College campus, the purpose of this study is to explore the following questions: What technologies related to smart phones, cell phones, and tablets do college students diagnosed mental disorders find the most helpful? What day-to-day responsibilities, activities, and occupations are college students with diagnosed mental disorders using smart phone, cell phone, and tablet technology for? What is the extent to which college students with diagnosed mental disorders are implementing smart phone, cell phone, and tablet technology into their daily lives? It is hoped that this study will both expand the current research in this area of mental health as well as provide valuable insight for further research to be done regarding mental health and the use of technology.

1. ____ x_____ General Information
2. _____x____ Related Experience of Investigators
3. _____x____ Benefits of the Study
4. _____x____ Description of Subjects

5. ____x____ Description of Subject Participation

6. ____x____ Description of Ethical Issues/Risks of Participation

7. ____x____ Description of Recruitment of Subjects

8. ____x____ Description of how Anonymity/Confidentiality will be maintained

9. ___N/A___ Debriefing Statement

10. __N/A__ Compensatory follow-up

11. ____x___ Appendix A – Recruitment Statement or Tear-off Cover Sheet

12. ____x___ Appendix B – Informed Consent Form(s)

13. ____x___ Additional Appendices – Survey Instruments

ALL-COLLEGE REVIEW BOARD PROPOSAL

1. General Information:

a. Funding: $150 will be acquired from the Graduate Occupational Therapy department at Ithaca College in the form of three $50 Amazon gift cards for incentives for partaking in a separate, optional survey that will collect the participant's email address and will not be connected in any way to the original survey through a Qualtrics protocol laid out in the item 7b: Inducement to participate/extra credit. Three emails will be selected at random by Qualtrics.
b. Location: Ithaca College
c. Time Period: Mid to late November for survey implementation and November to February for evaluation and completion of study. Presentation of final research will be done at the Occupation Therapy Graduate Research Colloquium on March 21st 2016.
d. Expected Outcomes: I hope to publish this research.

2. Related Experience of Researchers:

Lynn Gitlow, Ph.D., OTR/L, ATP, FAOTA is an associate professor of occupational therapy at Ithaca College. Dr. Gitlow has been an Occupational Therapist (OT) for over 25 years specializing in the areas of mental health and assistive technology. She is also certified by RESNA as an assistive technology practitioner (ATP). Her research has focused on barriers to assistive technology and everyday use in various groups including health care practitioners and persons with mental health diagnoses. Dr. Gitlow has published her research in peer-reviewed journal. Additionally she has presented at local and international conferences on the topic of assistive technology and everyday technology use as an occupational therapy intervention

Student researcher has completed course work in the following courses: General Psychology, Abnormal Psychology, Clinical Psychiatry, Research Methods, and Quantitative Concepts for Professional Reasoning.

3. Benefits of the Study: The benefits of the research for the researcher are completion of a graduate level thesis as well as the potential for a scholarly publication. The participants may benefit by contributing to research that can potentially improve technologies available for students who have mental health challenges. The participants will also gain insight into their own technology use. The greater scientific community will gain an insight into college students with diagnosed mental disorder's use of technology in their everyday lives, an area where current research is sparse.

4. Description of Participants

a. **Number of Participants:** As of 2012, according to the National Alliance on Mental Illness (NAMI), about 25% of college students have been diagnosed and treated for a mental disorder in the past year. Based on these statistics, it can be estimated that the maximum amount of participants for this survey is 1,640, abiding by the last available undergraduate and graduate populations stated on the Ithaca College website.
b. **Salient Characteristics:** Subjects must be between the ages of 18-24 and have been diagnosed with a mental disorder, which for the purposes of this study includes the following: anorexia nervosa, anxiety disorders, bipolar disorder, borderline personality disorder, bulimia, major depressive disorder, post-traumatic stress disorder, and schizophrenia.

5. Description of Participation: The link to the Everyday Technology Survey will open up to the recruitment statement included in Additional Appendices. The Everyday Technology Survey should not take more than 20 minutes to complete. After completion of the Everyday Technology Survey, participants will be automatically directed to a second, optional survey asking them to provide an email address to enter a random drawing for a chance to win one of three $50 Amazon gift cards. A description will be included on this second survey stating that, if provided, the participant's email address will not in any way be affiliated with or kept on the same Microsoft Excel charts as their responses to the first survey. There is no deception or face-to-face interviews involved in this study**.**

6. Ethical Issues:

a) **Risks of Participation:** The risks of this study are time commitment and emotional stress from answering of sensitive and personal questions. The study should take 20 minutes or less to complete.
b) **Have you attached an Informed Consent Form or Tear-Off Cover Sheet for anonymous surveys?** Yes.

7. Recruitment:

a) **Procedures:** Advertisement of this survey will take place through the Internet. Intercom announcements will be posted containing a description of the study as well as a link to the Everyday Technology Survey. The researchers are currently in the process of getting

permission from Counseling and Psychological Services, Student Accessibility Services, and the student mental health organization Active Minds to allow the link to the Everyday Technology Survey to be posted on public pages affiliated with each of these organizations or departments. These organizations or departments will not send emails out to specific individuals. The link to the Everyday Technology Survey will be posted on Facebook pages and/or bulletins created by these organizations or departments with a brief description of participation and confidentiality. Additionally, The Qualtrics survey will always open to the recruitment statement no matter how the participant accesses the survey link.

b) **Inducement to Participate/Extra Credit:** Three $50 Amazon gift cards will be provided at random for participants who choose to enter a random drawing. A separate, optional survey will be created that will collect the participant's email address and will not be connected in any way to the original survey. Subjects will not receive extra-credit in any course for their participation in this study.

8. Confidentiality/Anonymity: Surveys will be distributed anonymously via a Qualtrics design and survey items do not ask participants to any disclose personal identifiers. There will be two surveys, the Everyday Technology Survey and a random drawing for one of 3 $50 Amazon gift cards. Both surveys are included in the Additional Appendices section. According to the Qualtrics instructional guide found on the Qualtrics website, the separation of the two surveys occurs as follows: When participants finish the first survey containing the primary survey questions, they will be automatically directed to the second survey, which will collect contact information. Since it is in a separate survey, contact information will be stored in a separate data set. The data collected from the first survey will not be affiliated with nor will appear on the same Microsoft Excel charts and data sets of the emails collected from the second survey and thus uphold the anonymity of responses from the first survey. The primary researcher has been in contact with a staff member of the Office of Institutional Research to ensure the Qualtrics survey is set up according to these parameters. Survey items in the Everyday Technology Survey will not ask any questions that reveal any identifying information. The results of both surveys will be downloaded onto two separate Microsoft Excel spreadsheets, one for each of the two surveys. These spreadsheets containing the results will be kept for a minimum of 5 years and the data will be stored on a password-protected computer and on a flash drive that will be stored in a locked cabinet in a faculty member's locked office at all times.

9. Debriefing: N/A

10. Compensatory Follow-up: N/A

Proposed Date of Implementation: Early-Mid November 2015

Signature of Principal Investigator:

_____

Electronically submitted protocols must be sent from an Ithaca College e-mail account. Original signatures are not required. Ithaca College e-mail IDs have been deemed by the College to constitute a legal signature.

Appendix B: Letter of Approval from the Ithaca College Institutional Review Board

ITHACA COLLEGE
Sponsored Research

November 10, 2015

Matthew Deveau, Graduate Student
Department of Occupational Therapy
School of Health Sciences and Human Performance

Re: IRB 1015-03, Exploration of College Students with Diagnosed Mental Disorder's Use of Everyday Technology

Thank you for responding to the stipulations made on October 15, 2015 by the Institutional Review Board for Human Subjects Research (IRB). You are authorized to begin your project. This approval is issued under the Ithaca College's OHRP Federal-wide Assurance #00004870 and will remain in effect for a period of one year from the date of authorization.

Please add the IRB approval number (IRB 1015-03) to all recruitment and consent materials.

After you have finished the project (when data collection is complete and there is no further risk to human subjects), please complete the *Notice-of-Completion Form* found on the Sponsored Research website. Please note that review/approval of future proposals is contingent upon submission of this form.

Should you wish to continue the approved project beyond the expiration date, you may request an extension by sending an email to irb@ithaca.edu before November 9, 2016. *If the project expires, you must complete a new application for expedited review.*

Please note that if there are any adverse events resulting from this research, they must be reported to the IRB at irb@ithaca.edu.

Sincerely,

Wade Pickren, PhD
Director, Sponsored Research
Institutional Review Board for Human Subjects Research

/mat

c: Lynn Gitlow, Professor

953 Danby Road • Ithaca, NY 14850 • (607) 274-1206 • (607) 274-3064 fax
www.ithaca.edu/sponsored-research

Appendix C: Recruitment Materials

For my Master's research thesis for the Ithaca College Occupational Therapy department, I am looking at how college students with diagnosed mental disorders use and would like to use everyday technology such as smartphones, cell phones, and tablets. I am asking you to fill out the attached anonymous survey ONLY IF YOU ARE AT LEAST 18 YEARS OLD AND ONLY IF YOU HAVE A DIAGNOSED MENTAL DISORDER. For the purposes of this study, diagnosed mental disorders include the following: anorexia nervosa, anxiety disorders, bipolar disorder, borderline personality disorder, bulimia, major depressive disorder, posttraumatic stress disorder, and schizophrenia. The Everyday Technology Survey asks you to respond to questions about what type of technology you own (smartphones, cell phones, or tablets), what you currently use it for, and what you would like to use it for. Additionally, at the conclusion of this survey, you be asked if you wish to enter an OPTIONAL drawing for one of three $50.00 Amazon.com gift cards by providing your email address. If provided, your email address will not in any way be affiliated with your responses to the Everyday Technology Survey. All parts of the Everyday Technology Survey and random drawing are completely voluntary and are not required. You can skip any questions you do not want to answer and may withdraw from this study at any time. If you find the material disturbing, please contact Counseling & Psychological Services (CAPS) at 274-3136 or your therapist to discuss your feelings.

This study has minimal risk. The risks associated with this survey are the emotional stress from answering sensitive and personal questions and time commitment. It should take about 20 minutes or less to complete. DO NOT TYPE OR OTHERWISE IDENTIFY YOURSELF BY NAME ANYWHERE ON THIS SURVEY.

Thank you for your help with this important research. If you have any questions please contact Lynn Gitlow, lgitlow@ithaca.edu (607) 274-1532

Matthew Deveau
Ithaca College, OT Student, OT Department

Appendix D: Survey Instrument

Survey A - Everyday Technology Survey

The purpose of this survey is to gain understanding about how you currently use, and how you would like to use your everyday technology such as smartphones, cell phones, and tablets.

1. What is your gender?
   - Male
   - Female
   - Other

2. What is your age?
   _____

3. What is your ethnic background?
   - Asian/Pacific Islander
   - Black/African American
   - Hispanic/Latino
   - Native American
   - White/Caucasian
   - Other (please specify)
     _____

4. Where do you live?
   - Apartment
   - Private house
   - Dorm
   - Other
     Please specify _____

5. Do you live with anyone else?
   - Yes
     With whom? _____
   - No

6. Are you employed?
   - Full-time
   - Part-time
   - I am not currently employed

7. Please identify which diagnosed mental disorder you identify with. Check all that apply:
   - Anorexia nervosa
   - Anxiety disorders
   - Bipolar disorder

Borderline personality disorder
Bulimia
Major depressive disorder
Posttraumatic stress disorder
Schizophrenia
Other/Not listed (please specify)
_____

8. Do you use any of the following aids? (Check all that apply)
Screen reader
Screen magnifier
Hearing aid
Cochlear implant
Teletypewriter device for the deaf (TTY)
Telephone relay service or video relay service (including captioned telephone (CapTel) services)
Sign language interpreter
Augmentative and alternative communication (AAC) device or software
Text-to-speech technology
Speech-to-text technology
Wheelchair
Crutches, cane or walker
None of the above
Other (please specify other aids)
_____

9. Do you own or use a wireless device such as a smartphone, cell phone, or tablet?
Yes
No

10. If you own or use a smartphone, cell phone or tablet, what kind do you use? (Check all that apply)
I do not own or use a smartphone, cell phone, or tablet
Cell phone/basic phone (Examples: Motorola Razr, Pantech Breeze, Nokia 6350, Owasys)
Smartphone (Examples: iPhone, Android phone, BlackBerry, Windows phone)
Tablet (Examples: iPad, Kindle Fire, Galaxy Tab, Google Nexus 7, BlackBerry PlayBook)
Other (please specify)
_____

11. If you own or use a SMARTPHONE, what kind do you have? (Check all that apply)
I do not own or use a smartphone
Android-powered smartphone (Examples: Motorola Droid, Samsung Galaxy S)

Apple iOS smartphone (Example: Apple iPhone)
BlackBerry smartphone (Example: BlackBerry Bold 9700)
Windows-powered smartphone (Examples: Nokia Lumia, HTC Tilt, LG Quantum, Samsung Focus)
WebOS-powered smartphone (Example: Palm Pre or Pixi)
Don't know
Other (please specify)

_____

12. If you own or use a TABLET, what kind do you have? (Check all that apply)
I do not own or use a tablet
Android-powered tablet (Examples: Samsung Galaxy Tab, Amazon Kindle Fire)
Apple iOS tablet (Example: Apple iPad)
BlackBerry tablet (Example: BlackBerry Playbook)
Windows-powered tablet (Example: Microsoft Surface)
WebOS-powered tablet (Example: Hewlett-Packard (HP) Touchpad)
Don't know
Other (please specify)

_____

13. What do you PRIMARILY use your smartphone, cell phone, or tablet for?
Professional use (work or school)
Personal use
Both professional and personal use
Emergencies only
Other (please specify)

_____

14. How satisfied are you with your smartphone, cell phone, or tablet?
Very dissatisfied
Dissatisfied
Somewhat dissatisfied
Neutral
Somewhat satisfied
Satisfied
Very satisfied

15. How easy is your smartphone, cell phone, or tablet to use?
Very easy to use
Easy to use
Somewhat hard to use
Hard to use
Can't use it without help

16. In the past MONTH, have you had any of the following experiences with your smartphone, cell phone, or tablet? (Check all that apply)

Was frustrated because my smartphone, cell phone, or tablet was taking too long to download something

Had difficulty entering a lot of text on my smartphone, cell phone, or tablet

Had difficulty reading something on my smartphone, cell phone, or tablet because the screen or the text was too small, or because my screen reader couldn't read it out loud

Used my smartphone, cell phone, or tablet for entertainment or when I was bored

Pretended to be using my smartphone, cell phone, or tablet to avoid interacting with people around me

Was in an emergency situation where having my smartphone, cell phone, or tablet really helped

Used my smartphone, cell phone, or tablet to get information that I needed right away

Used my smartphone, cell phone, or tablet to get directions while I was outside of my home

Used my smartphone, cell phone, or tablet to make plans with others

Turned off my smartphone, cell phone, or tablet for a period of time just to get a break from using it

Was in a situation where I had trouble doing something because I didn't have my smartphone, cell phone, or tablet with me

17. Have you added or changed anything to your PRIMARY smartphone, cell phone, or tablet to make it easier to use? If so, what kind of things have you added? (Check all that apply)

No changes or additions

Physical accessories – (protective skin or case, headset, other)

Bluetooth device, screen overlay, lanyard, stylus, etc.

Assistive Devices – (head-switch, electromyographic (EMG) switch, augmentative and alternative communication (AAC) device, neck loop, teletypewriter (TTY), etc.)

Software (3rd-party text-to-speech software, screen reader, screen magnifier, app store downloads, etc.)

Improvised solutions (hand strap, Velcro, wheelchair mount, etc.)

Other (please specify)

_____

18. About how many different apps do you use on your smartphone, cell phone, or tablet on a typical day?

My cell phone, or tablet cannot download apps

0

1 or 2

3 to 5

6 to 10

More than 10

19. If you have ever paid for an app, HOW MUCH is the most you have paid?

My wireless device CANNOT download apps

My wireless device CAN download apps, but I don't download apps
I have never paid for an app; I download only apps that are free
$1.00 or less
$1.01 to $2.00
$2.01 to $5.00
$5.01 to $10.00
$10.00 to $20.00
More than $20.00
Don't know

20. Please mark all that apply. If you are not using any feature or would not like to be using any feature, then leave the respective row that the feature is in blank.

Features:	I am using this feature:	I would like to be using this feature:
Example:	X	
Voice calling		
Video calling		
Text messaging		
Email		
Web browsing		
Navigation		
Sending photos and/or videos		
Social networking (Facebook, Twitter, Instagram, LinkedIn, etc.)		
Watching videos		
Listening to music		
Playing games		
Using voicemail		
Recording voice notes or reminders		
Calendars/notepad		
Contact book		
Shopping		
Monitoring health and Fitness		
Downloading applications (apps)		
Remembering to take medication		
Helping to relieve stress		

Relaxation		
Monitoring my symptoms		

21. What would you like your device(s) to do that it currently cannot do?

_____

I don't know or prefer not to answer

22. What device(s) would you like to have and why do you not have this device currently?

_____

I don't know or prefer not to answer

Survey B - Random Drawing for One of Three $50 Amazon Gift Cards

Thank you for participating in this important research! We would like to thank you by giving you the chance enter a random drawing to win one of three $50.00 Amazon.com gift cards. This is OPTIONAL and you may skip if you do not wish to enter the drawing. If you do wish to enter, all we would need from you is your email address, please type it in the box below. If you choose to provide your email address, it will not in any way be affiliated with your responses to the Everyday Technology Survey you just took. Thank you again for your time!

Please enter your email address below:

_____