Investigating the Efficacy of Virtual Experiences on Stress Reduction

(Technical Paper)

How Cultural Attitudes, Familial Dynamics, and Societal Expectations Affect Mental Health Outcomes and Resource Usage for Asian Americans

(STS Paper)

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

Introduction

There is an increasing emphasis on college campuses and workplaces about the impact of mental health on personal wellbeing and performance, specifically with anxiety, depression, and stress. Mental illness has profound effects on the community and economy through direct and indirect healthcare costs and lost workplace productivity. One in every five Americans experience mental illness every year. Therefore, it is essential to provide better mental health support in high stress environments like an academic or workplace setting (Lipari, 2018). The purpose of the technical research project is to investigate how virtual reality (VR) technology can be used to implement Attention Restoration Theory through a variety of 3 dimensional environments to mitigate stress and anxiety in the workplace.

However, poor mental health is not limited to the academic and workplace setting. Mental illness is multifaceted and can look and feel different for everyone. There is a diversity of experiences and perceptions surrounding mental illness, which is influenced by cultural upbringings, genetic history, and personal experiences. The STS topic proposed specifically explores how mental illness is perceived and experienced through the lenses of Asian Americans. In Asian American culture, the topic of mental illness is considered taboo and is often not discussed (Zhang & Ta, 2009). The stigmatization of mental illnesses has led to Asian Americans underusing mental health services, which further decreases the amount of culturally competent resources (Abe-Kim et al., 2007). The cultural attitude towards mental illness, familial dynamics, and level of access to mental health resources all shape how mental illnesses, particularly invisible mental illnesses such as depression, anxiety and stress are experienced by Asian Americans.

Technical Topic

Due to rising costs of medical and pharmaceutical treatments, employers are seeking innovative ways to manage healthcare expenses for employees and their dependents. Studies show that 42% of employees report feeling stressed at work and are linked to 15-30% greater healthcare costs. However, a much smaller portion of employees, around 22%, report being able to cope with stress very well (Colligan & Higgins, 2006). Many people in the workplace struggle to manage their stress on a regular basis, thus impeding productivity and overall workplace satisfaction. Given this current situation, many employees cannot depend on their own capabilities, and instead require some external aid to help reduce stress and increase productivity. Therefore, a solution that would reduce workplace stress and increase productivity would appeal to both employees and employers.

The technical project will explore the combination of Attention Restoration Theory (ART) and VR technology as a novel therapy for short- and long-term stress reduction and anxiety management. Previous evidence of biometric data support that VR environments are successful in reducing anxiety (Gorini & Riva, 2008). Traditional treatments for stress and anxiety include medications, therapy, or self-care techniques such as meditation. However, these treatments are expensive and time consuming, and are not quick outlets for everyday stressors such as those found in the workplace, such as running meetings and presentations. Readily accessible digital technologies, such as VR technology, are better suited for improving mental health in a workplace setting.

Study participants will undergo VR micro-vacations through a virtual reality program and private booth provided by Even Health that guides them through various settings in nature. The

VR therapy is designed to implement Attention Restoration Theory, or the theory that nature will restore the ability to concentrate, thus reducing stress and anxiety and promoting productivity (Ohly et al., 2016). This theory is a validated approach to reducing stress in clinical settings as well as improving productivity and mitigating stress and anxiety in the workplace. The goal of this project is to mitigate the rising cost of healthcare for both employers and employees through implementation of innovative technologies in the workplace that ultimately help individuals build emotional strength and better manage stress and anxiety.

First a literature review will be conducted to understand previous research and studies on this topic. The literature review will help the team to understand the metrics to be collected and the tests that should be performed to evaluate the efficacy of the virtual reality intervention. Once this information is gathered, an IRB protocol will be drafted detailing the procedure of the experiment. Pilot testing will then be performed during the months of November and December 2019. The study will be conducted in the basement of Olsson Hall at the University of Virginia during the months of January through February. After giving informed consent, study participants will complete a task prior to the experiment that induces minor stress or fatigue. Examples of such tasks might be a puzzle, math problem, or multi-tasking activity. The participants' biometric data will then be collected through heart rate variability sensors, blood pressure gauges, and the measuring of galvanic skin response. This preliminary test will serve as baseline data to ultimately measure the efficacy of the VR therapy on participants. The participants will then be immersed in the VR booth for 5-8 minutes, where they will select a restorative environment, or microvacation, of their choosing from 2-3 given options (i.e. beach, lake, mountaintop). Physiological changes in patients and biometric markers will be monitored throughout the therapy. Afterwards, the participants' biometric data will again be collected for

comparison of pre- and post-stress levels. This data will give insight on how Even Health can leverage VR technology to create a successful product that mitigates workplace stress and anxiety.

STS Topic

Although there are many efforts to improve mental health across the country, Asian Americans are still underrepresented and underserved. According to the US Department of Health and Human Services, suicide is the leading cause of death for Asian Americans between the ages of 15-24 in the United States. Additionally, the number of Asian American adults who received mental health services in 2018 is 30% of their white counterparts ("Mental Health—The Office of Minority Health," 2018). Low usage of mental health care or resources may be indicative of the dismissive cultural attitude towards mental illness, particularly invisible mental illnesses such as depression and anxiety, and inadequate support on an infrastructural level. The level of stigmatization may vary within the Asian American community since the perception of mental illness is also generation and age dependent due to distinctive cultural upbringings, as younger generations tend to be more receptive of mental health dialogue (Valles, 2019). In addition to these differences in perception, there are unique traumas and cultural attitudes specific to Asian Americans, such as the prevalence of PTSD in Southeast Asian refugees (CDC, 2018). Providing culturally sensitive support and resources for mental health is essential for treating traumas unique to Asian Americans in addition to continuing important dialogue about mental illness and reducing its stigma in Asian American communities (Zhang & Ta, 2009).

However, there are obstacles to adequate mental health care for Asian Americans, such as lack of access, underrepresentation in research, or fear of stigma from family or the community (Chin, 2002). Some studies estimate that 1 in 2 Asian Americans have difficulty locating mental

health resources because of language barriers, indicating that the mental health infrastructure is only supporting half of the Asian-American population (Ruiz & Primm, 2012). The quality of care Asian Americans receive are often of poorer quality than those received by their white counterparts (Wu et al., 2018). All these factors contribute to the underdiagnosis and underrepresentation of mental illness in Asian Americans.

Mental health is a large and complex topic, encompassing many key stakeholders and artifacts. Stakeholders include Asian Americans with mental illness (diagnosed or undiagnosed), healthcare professional, and community leaders. Although the term Asian American may be monolithic, and may not fully represent particular ethnicities, there are shared cultural attitudes among Asian Americans, particularly towards mental illness (Tummala-Narra & Yang, 2019). In Korean culture, for example, mental illness is viewed as shameful and embarrassing and is treated as taboo in everyday conversation (Jang, Chiriboga, & Okazaki, 2009). Fortunately, this cultural attitude is shifting with the younger generation, as more and more Korean-Americans recognize mental illness as a serious medical condition. Although there are many nuanced differences in cultural attitudes among the many ethnicities in Asia, mental illness is typically viewed as a weakness or as shameful across all Asian cultures, whether it be East, Southeast, or South Asia (Takeuchi, Hong, Gile, & Alegría, 2007). This common experience with mental illness across most Asian Americans makes their needs unique, but also unifies them as a key stakeholder.

Healthcare professionals, on the other hand, act as gatekeepers to mental health resources and services and as care providers. They determine what type of care the patient receives, whether they receive treatment or not, and their physical proximity determines the level of access a patient has to resources and services. Access to healthcare professionals is particularly relevant

in low-income communities where mental health resources and services are underfunded and underserved. Community leaders are important in changing the perception of mental health within Asian American communities. For example, community leaders, such as spiritual or religious advisors, acting as psychiatrists, can increase mental health services usage among Asian Americans because religion and spirituality are integrated in aspects of Asian American culture (John & Williams, 2013). Community leaders can also serve as an educational resource and cultural outreach agent that, along with educational programming, can promote mental health in underserved communities (Wong, Collins, Cerully, Yu, & Seelam, 2018). Artifacts in this system include the technology that is used to diagnose and treat mental illness, such as lab tests and MRI machines, policies and laws that influence mental illness funding and healthcare, and programming that educates and serves the mental health needs of the community.

These stakeholders and artifacts will be analyzed under the technological momentum framework to identify unique mental health needs within the Asian American community and potential organizational and educational interventions to provide more culturally competent resources and care and reduce disparities in the access. Technological momentum is defined by historian Thomas Hughes as: “A more complex concept than determinism and social construction, technological momentum infers that social development shapes and is shaped by technology.” (Hughes, 1994). Under this framework, the sociocultural and technical components of the system interact and influence each other, although often it is not an equal relationship. Although the term mental health was coined in 1908, the mental health system in the US is still developing (Bertolote, 2008). A developing system is influenced more by sociocultural factors than technological factors (Hughes, 1994). In this analysis, the sociocultural components of the system are the cultural attitude towards mental health, familial dynamics, and patient-healthcare

professional relationship which shapes how the technology, or treatment of mental health, is used. On the other hand, the technologies are also shaping the social components of the system. For example, there has been a recent explosion in mobile mental health technologies, which has dramatically increased accessibility to mental health resources while preserving privacy (NIMH, 2019). The major advantages of these mobile technologies are that they are cheap or free, and patients are able to circumvent stigmatization from others because patients can seek treatment without involving others. Additionally, the increasing popularity of these mobile technologies has normalized and increased visibility to mental health issues, which has profound impacts on the cultural conversation and attitudes surrounding mental health. Although technological momentum is a generally accepted STS framework, some critics of this framework argue that technological momentum places the technological component at the core of the system and relates everything else to the system to it. Therefore, it remains an essentially deterministic system where only the technology is driving sociocultural changes (Hughes, 1994). However, in this analysis, there is no individual technology or sociocultural factor that is driving the system, but rather some combination of those technologies and factors.

Research Question and Methods

The STS question is "How can cultural attitudes, familial dynamics, and level of access be taken into consideration to improve mental health usage and outcomes in Asian Americans?" This paper will use the STS framework of technological momentum to identify and analyze the relationships between the aforementioned stakeholders and artifacts. The analysis will be accomplished through documentary research methods, surveys, and historical case studies. A literature review will be conducted to synthesize documentary research such as clinical studies and academic papers to characterize the relationship between the stakeholders and artifacts.

Additionally, a survey will be conducted to gauge stakeholder's perception of mental illness and care. After these relationships are established, the gaps in patient needs and treatment will be identified through historical case analysis and clinical studies. Historical case analysis will also give insight into current practices and treatments and can be used to create an organizational mental health infrastructure that supports needs specific to Asian Americans can be created.

Conclusion

The technical deliverable will provide evidence through data analysis and simulations that VR technology can be used successfully to reduce workplace stress and anxiety and provide a better work environment. This information will be used to market a mental health booth equipped with VR technology for the client, Even Health. The STS deliverable will elucidate contributing factors to Asian American mental health and identify culturally competent interventions and resources that promotes good mental health practices and increases usage of mental health resources such as therapy and medications for those that need it. This information establishes organizational mental health infrastructure for Asian American communities, and provides best practices for educational programming that can reach the community and change the perception of mental health to improve care.

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