Increasing Engagement and Decreasing Attrition in eHealth Interventions
(Technical Paper)

Comparison of the Growth and Hindrance of the Opioid Epidemic in the US and the UK
(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.

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General Research Problem: Improving Treatment for Anxiety-Producing Mental Health Disorders

How can improving eHealth interventions and increasing awareness of the underlying issues of the opioid epidemic help bridge the mental health treatment gap?

Anxiety and mental health problems are a common experience shared by many, in fact, about 1 in 5 adults (roughly 47.6 million people) in the U.S. have been diagnosed with some form of mental illness, but less than half (43.3%) received treatment for their mental illness this past year (NAMI, 2019, p.1). This disparity between those who seek and actually complete treatment, known as the mental health treatment gap, is due to barriers created by societal stigmatization, lack of readily available resources, cost of service, unavailability of insurance coverage, lack of motivation, and mistrust of psychologists and other mental health professionals (Andrade et al., 2013, p.11). Although eHealth interventions, which are usually online modules, have implemented intervention therapy programs already, these programs fail to retain users throughout the course. To improve retention rate and user engagement in online interventions, further research and development is necessary to create the optimal treatment and engagement experience to keep target subjects participating in studies to completion.

Another major reason for this treatment disparity, which tends to go unnoticed, is the prevalence of drug addiction. Substance use disorder is a mental illness that has the potential to produce intense anxiety within those whom it directly affects. Herein lies the link between Technical and STS research topics: mental health disorders that produce anxiety and bridging the current mental health treatment gap. The STS research topic takes this overarching issue introduced by the Technical topic and shifts the focus to the specific illness of substance use disorder, and then focuses that down even further to a specific type of substance. A significant

portion of modern addiction is the addiction to opioids such as OxyContin and heroin. This "opioid crisis," as it is referred to in its current state, has been fueled by the excessive marketing of OxyContin and the lies spread by Purdue Pharma regarding the efficacy and addictive nature of OxyContin. Because of the excessive and unprecedented marketing of OxyContin in the drug's early days, doctors have overprescribed opioids to patients in pain, spinning the endless cycle that is the life of many addicts (Van Zee, 2009, p.223).

Increasing Engagement and Decreasing Attrition in eHealth Interventions

How can the implementation of personalization and improved automation techniques in a web application improve its overall engagement and ability to treat users suffering from anxiety?

The implementation of this technical topic has been through a web application called MindTrails. This application helps those diagnosed with anxiety-related mental illnesses to cope with their anxiety and trains them to think more positively. MindTrails is an online intervention tool that uses Cognitive Bias Modification (CBM) to alter negative interpretations of situations and stimuli by participants with anxiety. CBM interventions are designed to change attention and interpretation biases via repeated practice on cognitive tasks, namely those biases that confer vulnerability to anxiety (Beard, 2011, p.299). There are two types of tasks already implemented in the MindTrails application that participants complete. The first type of task requires individuals to read through an ambiguous scenario and fill in a letter of the last word to complete the sentence. The second type of task asks individuals to imagine themselves in a scenario, think about their emotional experience in that situation, and then rate their anxiety. The intervention goes through five levels of training sessions with a mandatory five-day break between each session. MindTrails is currently presenting the same scenarios to

every user and is facing high rates of attrition.

The ultimate goal of the MindTrails redesign is to improve the intervention scenarios shown to users and to customize the set of scenarios presented to specific users. The intervention scenarios will be modified to incorporate implementation intentions, or if-then scenarios, and to actively encourage goal-setting by users. Personalizing scenarios could reduce the rate of attrition by making the scenarios more relevant to the user and increasing the impact on the participant by centering the scenarios around situations in which they can more realistically imagine themselves. Using implementation intentions and goal-setting as the user completes the MindTrails program would allow participants to understand how to apply the MindTrails training to their daily lives.

The primary goal is to help the MindTrails team integrate personalized scenarios and design ideas backed by literature and case studies. Current ideas for customizing scenarios include using information collected by demographic questions already included in signing up for the program, as well as potentially adding questions. For example, if the participant indicates that they are a student, scenarios regarding working in an office could be omitted. If the participant checks off that they have one or multiple particular disorders, information about specific symptoms of disorders they do not have and ways of battling those could be omitted as well. Or if the participant indicates that their boss is female, they could be presented a sentence such as, “You have a meeting with your boss in *her* office,” which adds personal relevance to the task. MindTrails could also allow users to specify what gives them anxiety, such as social situations or health. The current idea for implementation intentions and goal-setting include is producing a wireframe. A wireframe would show how the if-then statements that make up the implementation intentions will be presented to the user and how goal-setting features will be added to the current MindTrails interface.

Comparison of the Growth and Hindrance of the Opioid Epidemic in the US and the UK

What similarities and differences exist between the US and the UK's approach to battling the opioid epidemic, specifically with regards to the prescribing of the opioids themselves?

Introduction

The issue of the mental health treatment gap and how the opioid crisis has fueled the growth of that gap is one worth exploring. The question of this STS Prospectus is, how have recent opioid prescribing patterns fueled the opioid epidemics in both the US and the UK, and how have the authorities within each nation begun to battle back with regulation and policy? What we know right now is that over 130 people die in the US every day from opioid overdose, and that the CDC estimates the total economic burden of prescription opioid misuse in the US is about $78.5 billion per year (NIH, 2019, p.1). Internationally, opioids are currently the most frequently prescribed pharmaceuticals, and an astounding 80% of new heroin users previously abused prescription painkillers (Gostin et al., 2017, p.1539). What we don't know is how all of these individuals are gaining access to prescription opioids so easily. Uncovering this "how" may point to a problem in the doctors themselves, who are the ones that allow the public to legally gain access to opioids through signing prescriptions. And if the problem truly does exist, then what are governments doing about it? We must find out the true extent of this prescription problem, what new policies have been invoked, what new regulations have been passed, and who (if anyone) has been punished for negatively affecting peoples' lives and society as a whole.

Context

There are key groups shared by both the US and UK, such as pharmaceutical

companies that have dealt in opioids, prescribing physicians and pain management specialists, policy makers and whistleblowers at all levels who have invoked policy on issues relevant to this or are working to do so, advocates for pain treatment, those that are currently addicted to, are in recovery from addiction to, or have perished in the grip of addiction to opioids, and of course the families and peers of those involved in addiction. The agendas of each have varied over the years and/or continue to vary to this day. The pharmaceutical companies' agendas seem pretty similar across the board: optimize profits at all costs. The methods these companies use to optimize profits illuminate the companies' disregard for cost. When OxyContin hit the market in the 1990s, the marketing plan Purdue Pharma presented to physicians involved the misrepresentation of the drug's addictive nature and false claims about its efficacy. Many of the executives in charge of these marketing campaigns have been put on trial and are set to pay hundreds of millions of dollars in fines (Van Zee, 2009, p. 223). The agendas of the actual prescribing physicians and pain management specialists can be a bit blurred. Studies have shown that opioids are not effective for long term pain management and are highly addictive. The CDC even recommended using non-opioid pain therapy because the net risk of prescribing opioids is not worth the short term relief that they may give to the patient (Dowell et al., 2016, p. 1). In one anecdote, a woman had just had hip surgery, and seemingly without a second to spare her pain management specialist gave her a prescription for a pack of 10mg OxyContin. She became addicted, and when she no longer could afford the higher-priced over the counter fix, she turned to the cheaper opioid: heroine. Doing so resulted in a nine-year addiction (John Mclean Media, 2016, n.p.). The agenda of the addict is one of two storylines: finding the next fix, or finding a way out. The latter is the vast minority here. Those who have found a way out and are in recovery are taking their lives one day at a time trying to stay sober, as well as trying to help those currently struggling in addiction (usually). I

know this because I currently live in the world of an individual in recovery: myself. I have seen just about everything that comes with addiction firsthand, so I know how addicts and recovering addicts behave. The families of those in either situation want what's best for their kin, though they may not always vocalize or act on it because of the wrongs the family member(s) may have suffered from them. Shifting the focus from those directly involved on the ground level of addiction, we find individuals in healthcare and subsequent policymakers.

A key group that is different in the case of the US and the UK is those involved in healthcare. The UK has the universal National Health Service (NHS), while the US's healthcare system is private and varies per organization. The NHS has historically been underfunded and undersupplied, whether it be personnel or equipment. This has tended to result in some rundown hospitals, long waiting lists, and a shortage of specialists in just about every field. The NHS is a system that is designed for efficiency, but a shortage of funding sometimes can hold it back (Light, 2003, p.25). The fact that it is universal also creates some policy dilemmas for its overseers, such as reconciling the need for regional or national coordination while maintaining the ability to respond to needs locally, balancing public accountability with professional autonomy, and safeguarding national standards and a national system in lieu of individual principles of practice, to name a few (Light, 2003, p.25). In contrast, the US healthcare system is very well-funded, but its design seems to maximize inefficiency and inequity. The US relies on employers to offer health insurance coverage to employees and dependents, while government insurance programs are reserved for the elderly, disabled, and some of the poor (de Lew et al., 1992, p.151). There is almost no coordination between private and public programs, and all programs differ in terms of benefits, financial sources, and payments to medical care providers. Some people have both public and private coverage, while others have none. However, those who are uninsured may still receive health

care services through public clinics or hospitals, state and local programs, or even private providers who finance care through charity (de Lew et al., 1992, p.151). There is nothing universal when it comes to US healthcare, and this takes the same dilemmas that UK policymakers face and muddles them even further for US policymakers. Not only must one now find balance between individuals and state, but there must also be balance between individuals, state, and every healthcare provider that is relevant in said state.

Data Analysis

I will start by conducting a literature review on the background of the problem and how it began in each country. All sources gathered will be primary and secondary scholarly sources. These sources have consisted and will consist of peer-reviewed journal articles and studies that carry important statistical data and backed theories. I will then conduct a case comparison on the prescribing patterns of opioids in the U.S. and in the United Kingdom by finding studies that have surveyed the opiate prescribing methods of doctors in each country, and then analyzing these studies for possible wrongful prescribing (i.e. when the cost of addiction greatly outweighs the benefit of temporary pain relief). Finally, I will conduct a policy comparison between the US and the UK, attempting to find documents and testimony describing new policy and/or regulations put in place in order to hinder the wrongful prescribing of opioids. These may also include descriptions of lawsuits that have been won against particular individuals, setting precedent for possible punishments.

Conclusion

Once this project is complete, I would like to be able to show the cornerstones of the problem and/or solution in these situations. The pharmaceutical companies are the biggest culprits in causing this epidemic; however, it is the doctors who are the ones with the power

now because they can choose to either hand out these addictive drugs, or try and find an alternative for their patient(s). In a study done in 2005, no U.S. physician was disciplined by a state board solely for wrongly prescribing opioids. It was only after a complaint about something else was filed, such as prescribing to self or inadequate records, that a physician was actually disciplined (Richard & Reidenberg, 2005, p.209-211). Getting to the root of this issue is key, as we really have no idea how this is still going on, how or if these physicians are being disciplined at all today, or how whistleblowers are going about attacking these issues. From finding policies, regulations, and possible lawsuits regarding these issues, I hope to show just that. The pharmaceutical companies that started this have been dealt with or are being dealt with currently, and the one facet that governments can start changing is how these drugs are distributed to patients. Furthermore, this project will strive to enlighten readers to the fact that substance use disorder is one of the most prevalent anxiety-inducing mental illnesses in the world today, and that the improvement of mental health treatment goes hand in hand with the improvement of addiction treatment. Hopefully this research will also make it apparent that in order to help decrease attrition rates in regards to anxiety eHealth interventions, the inclusion of substance use disorder in the rhetoric will help reach a larger population of those struggling with such symptoms.

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