

Beyond the Therapy Room: Evaluating Mobile Applications for PTSD through a Trauma-

Informed Lens

by

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Abstract

Post-Traumatic Stress Disorder (PTSD) affects millions of people worldwide. Despite this, a significant gap still exists between those who have been affected and those who receive treatment. After exploring possible barriers leading to this gap, this capstone explores the use of mobile phone applications as an alternative or an additional tool to help connect these individuals with treatment. While research suggests that these digital tools can moderately reduce symptoms, the literature is marked by inconsistent methodologies and measurement tools. In response to these inconsistencies, this project proposes a 23-criterion evaluation list, primarily based on the Substance Abuse and Mental Health Services Administration's (SAMHSA) principles of Trauma-Informed Care. These criteria help provide a consistent standard to ensure digital tools promote healing rather than harm and are trauma informed. Ultimately, this capstone seeks to advance social justice by expanding access to safe, evidence-based interventions for those whom traditional healthcare is less accessible.

Keywords: PTSD, Trauma-Informed Care, mHealth, Mobile Applications, SAMHSA

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Chapter One: Introduction

Overview

This capstone project aims to explore alternative methods to help alleviate symptoms of Post-Traumatic Stress Disorder (PTSD) in response to the barriers that exist in accessing evidence-based treatments. Specifically, given the ubiquity of mobile phones, and their accessibility at nearly all times (Owen et al., 2018), this project focuses on mobile phone applications designed to reduce symptoms of PTSD. The barriers that exist in accessing treatment have significant consequences for those with PTSD, including risk of further traumatization, developing Substance Use Disorder (SUD), and early death (Brocker et al., 2023). Therefore, it is reasonable to focus on alternative methods, especially those that have the potential to help fill the gap that exists between those who need treatment and those who receive treatment.

What is Trauma?

According to the Substance Abuse and Mental Health Services Administration (SAMHSA, 2023), *trauma* is defined as follows:

Trauma results from an event, series of events, or a set of circumstances that an individual experiences as physically or emotionally harmful or life threatening and that may have lasting adverse effects on the individual's functioning and mental, physical, social, emotional, or spiritual well-being. Trauma is associated with widespread health challenges across demographic groups and can have far-reaching implications across individuals, families, and communities. (p. VII)

Some of the examples of these events include being exposed to an unexpected death, sexual violence, and other serious injuries (American Psychiatric Association (APA), 2022).

Events that are potentially traumatic may lead to Post-Traumatic Stress Symptoms (PTSS) that dissolve over time or might lead to PTSS that continue to affect the individual long-term, leading to a diagnosis of PTSD (Corthesy-Blondin et al., 2023). Overall, symptoms of PTSD can be categorized into four different groups: experiencing intrusion, persistent avoiding behaviour, negative changes in mood and cognition, and lastly, reactivity symptoms (APA, 2022).

According to the diagnostic criteria, these symptoms must be present for at least one month and have a significant effect on the individual's functioning (APA). Additionally, these symptoms must not be due to the influence of substance use or caused by another condition (APA).

The related Acute Stress Disorder is also described in the DSM-5-TR as a disorder with similar diagnostic criteria but manifesting within 3 days to 1 month of exposure to the traumatic event (APA). It is important to note that the way PTSD is experienced and how it presents itself is not the same across the world (SAMHSA, 2023). Importantly, some of the symptoms are associated with taboos in some cultures, leading to less identifiable symptoms (SAMHSA). Therefore, it is important to maintain cultural humility in detecting and providing treatment for PTSD (SAMHSA).

Neuroimaging studies have shown that PTSD is often marked by hyperactivity of the amygdala, the brain's alarm system, as well as a smaller hippocampus, which is involved in memory (Briere & Scott, 2025). Therefore, these studies can help explain why individuals with a PTSD diagnosis often exhibit symptoms such as avoidance, vigilant behaviour and exhibit poor memory (Briere & Scott). Importantly, considering the scope of this essay, these findings have been significantly simplified.

To better understand PTSD from a physiological point of view, it is also helpful to briefly explore the body's response in stressful situations. The body's sympathetic nervous system is

responsible for preparing us to respond appropriately to stressful situations, to remain safe (Briere & Scott, 2015). For example, by facilitating the release of neurotransmitters and metabolites, our body becomes more prepared to show appropriate responses such as by fleeing the situation or by fighting the danger (Briere & Scott). Usually, when the stressor is no longer a threat to our safety, the body returns to its baseline and returns to a calmer state (Briere & Scott). In PTSD, the return to the baseline, even after removal of the danger, is disrupted (Briere & Scott). The body seems to remain on high alert, which can be demonstrated as hyper-vigilance, aggressive behaviour, or panic attacks (Briere & Scott).

According to SAMHSA in 2023, approximately 70% of the world's population has experienced at least one potentially traumatic event in their lives, and approximately 30% have experienced more than three. While not everyone exposed to a traumatic event will automatically suffer from PTSD or Acute Stress Disorder, some will experience long-lasting effects (Bryant, 2019). According to APA in 2025, the prevalence of PTSD is estimated to be 5.6% of people worldwide, which includes over 450 million individuals. This data shows that exploring and studying PTSD and its effects could help a significant number of people and their families all around the world.

Lastly, ICD-11 introduced the diagnosis of complex PTSD, which apart from the symptoms mentioned above, has the potential to also lead to struggling with self-identity, lack of regulation, and relationship difficulties (Bryant, 2019). Adverse events such as childhood abuse and torture can lead to complex PTSD (Bryant). Considering the scope of this essay and the available literature, the current paper focuses on PTSD, acknowledging that the reported studies do not address complex PTSD or Acute Stress Disorder. While Complex Trauma is not directly addressed in the research explored in this capstone, the findings could potentially be beneficial to

this diagnosis, as well. This is because of the overlap that exists in how the symptoms are presented in PTSD and in Complex Trauma.

Trauma increases the risk of mental health disorders that are serious such as schizophrenia, or other psychosis-related disorders, as well as self-harm and suicide (SAMHSA, 2023). This is specifically the case if trauma has taken place in early childhood (SAMHSA), which further emphasizes the importance of addressing trauma and accessing evidence-based treatment. Specifically, being able to address trauma early on, and to develop preventative measures could help decrease the incidents of serious mental health disorders, self-harm and suicide.

Purpose Statements

The purpose of this capstone is to review the available evidence regarding the effectiveness of use of mobile phone applications in alleviating the symptoms of PTSD and potentially be used as a stand-alone treatment, or in conjunction with therapy. This purpose is fueled by the desire to help reduce the barriers that exist in accessing effective and evidence-based treatment. To be able to achieve this purpose, the following questions have guided this project:

- What is the nature of trauma and how is it addressed through established therapy models? What are some of the barriers in receiving these treatments?
- What are the available alternative methods to help individuals who have experienced trauma, especially if they are not accessing treatment currently?
- How do alternative methods that address trauma, specifically mobile applications, help outside the clinical setting?

- What are some of the limitations and ethical considerations of using mobile applications that aim to track, manage or treat PTSD in individuals? How can the evaluation of these applications be more beneficial and consistent?

These questions are driven by a desire and commitment to promoting social justice and expanding access to therapeutic interventions through widely used digital tools. The audience for this project consists of counsellors and other mental health professionals who offer treatment for PTSD. By being aware of the available and evidence-based mobile applications, these groups can help connect treatment seekers with accessible interventions more effectively and in a timelier manner. Additionally, researchers and software developers who are active in the field of mental health can be informed as to what the strengths and limitations of current tools are to help develop applications more effectively. In addition, chapter three is aimed to help policy makers who monitor and evaluate mental health mobile applications, such as the Mental Health Commission of Canada (MHCC), to develop a clear and consistent evaluation method for these applications.

The above-mentioned purpose statements further aim to address a gap that exists in literature regarding use of mobile applications as an intervention for treating PTSD. While some studies have explored the role of these applications in tracking symptoms, fewer have addressed the clinical integration of these applications, or their alignment with trauma-informed principles, which are described below. Although this capstone may not close these gaps entirely, it seeks to shed light on how to begin to address this issue in a way that is more in line with trauma-informed practice, as described by SAMHSA (2023).

Theoretical and Conceptual Framework

In examining the implication of the studies explored, this project is based on the principles of Trauma-Informed Care provided by SAMHSA (2023). These principles help any intervention to provide responsible and effective care for those affected (SAMHSA). According to these principles, first and foremost, establishing safety is key, followed by creating a sense of trustworthiness and being transparent in working with the affected individual (SAMHSA, 2023). SAMHSA further guides that gaining peer support, creating a space for collaboration, encouraging empowerment, and addressing gender and cultural issues are the next key steps that need to take place in the order mentioned. While these principles are applicable to all parts of providing care, and not limited to direct therapy, they help with understanding trauma and preventing re-traumatization (SAMHSA, 2023). Considering that these principles are applicable to a variety of settings (SAMHSA), this capstone aims to use these principles in assessing and exploring mobile applications that target PTSD. Specifically, chapter three attempts to suggest a framework to ensure that mobile phone applications that aim to address PTSD are in fact trauma informed.

In exploring different interventions and mobile applications to address PTSD symptoms, various theoretical foundations are discussed in this capstone. These include Prolonged Exposure Therapy, Cognitive Processing, Trauma Focused Cognitive Behavioral Therapy, Acceptance and Commitment Therapy, and Mindfulness-based interventions. However, considering the scope, and the purpose statements, these frameworks are only described briefly.

Contribution to the Field

The current project and its implications could be a potential starting point for mental health professionals, specifically counsellors and policymakers in this field, to help offer

alternative and more available methods in lowering PTSD symptoms. This can eventually support treatment seekers who, for a variety of reasons, do not receive appropriate or timely care. Even though this capstone does not provide an alternative intervention to replace therapeutic work, it could provide an additional tool that could help mental health workers if needed. It is apparent that the evidence remains limited for PTSD interventions in low-income countries (Ng et al., 2025), among men (Brocker et al., 2023), and among youth (Schulte et al., 2024). Use of mobile phone applications, therefore, can expand reach across the world and different populations. More specifically, while in low-income countries evidence-based therapies and trained therapists might be less available, mobile phones and internet access are comparatively widespread (Ng et al.). Additionally, while males and youth are underrepresented in PTSD treatment research, use of mobile phones might help include all populations in the research in a more balanced way.

In addition, it is important to note that trauma negatively affects the level of trust in the healthcare system (SAMHSA, 2023). Increased levels of mistrust in individuals affected by trauma, coupled with non-consensual healthcare practices, and delays that might be construed as neglect, are some of the reasons why conventional therapy might not be the only choice for PTSD treatment. For this reason, increasing our understanding of alternative, safe, and anonymous methods might help increase the efficacy of trauma treatment overall.

Relevance in Canada

The results of a survey on mental health, as released by the Canadian Government in 2024, show that 8% of adults reported having severe or moderate PTSD symptoms (Statistics Canada, 2024). Additionally, the survey showed that over 60% of those living in Canada have been exposed to at least one traumatic event in their lives (Statistics Canada). In terms of having

received a diagnosis, the survey showed that 7.7% of the population have received a PTSD diagnosis at some point in their lives, while 6.1% have a current diagnosis (Statistics Canada and the Public Health Agency of Canada, 2024). In 2023, findings indicated that while informational and pharmacological needs related to mental disorders were generally addressed, access to counselling and psychotherapy continued to fall short for a significant portion of the population (Stephenson, 2023).

It is also important to explore certain populations that might benefit from trauma treatment more than others. Among all populations, first responders including paramedics, emergency dispatchers, firefighters, and police officers experience a significantly higher level of trauma and have been diagnosed with PTSD more than the general population (Canadian Institute for Public Safety Research and Treatment, 2024). Therefore, this project could specifically help address the urgent need of receiving treatment that could help those who are more at risk of developing PTSD, either as a stand-alone tool, or as a tool that can be used prior to receiving treatment, or with treatment.

Reflectivity and Positionality Statement

The choice to focus on this topic emerges from both my academic interest in the topic of trauma interventions, and from my experience of working at an organization that underwent a paradigm shift and became “trauma-informed” using SAMHSA’s (2023) guidelines and principles. This was a non-profit organization in Iran, with limited resources and staff, that aimed to provide psychological, social, educational and financial support for young women who had been or were exposed to severe traumatic events. Our clients were mostly adolescent girls and young women who were either institutionalized at a young age, were living with abusive or neglectful families, abandoned by families, or were not successfully included in any

governmental assisting programs. For many, this organization was their last and only hope. There were many limitations in providing one-to-one psychological support on an ongoing basis, leading to many clients dropping out of the program. It became a necessity to find alternative methods to address the needs of these clients in a more effective way, and training all departments in trauma-informed care principles proved to be that desired change.

During my work at this organization, I was able to witness, firsthand, that outside a therapy room, meaningful change can happen when working with trauma. It became clear to me that increasing “safety” and “connection” can help survivors of trauma be more engaged with the present moment and feel cared for. It was there that I saw learning about trauma in a class, having a safe community, learning about respect, and mindfulness practices significantly changed the level of engagement, perceived benefits of the program and overall results.

Since then, I am committed to promoting alternative or additional steps that need to be taken to help persons with PTSD or Complex Trauma. This is especially relevant when accessing treatment becomes more difficult, and it appears that all hope is gone. My hope for this project is to attract the attention of the reader to the potential significance of alternative methods, while also identifying areas that need more consistent research and evaluation in this area. This project addresses social justice by helping remove institutional barriers that might stand in the way of receiving treatment.

According to the ADDRESSING framework (Hays, 2001), it is important to note that as a cis-gender, upper middle-class and able-bodied woman I am in a position of power. At the same time, as an immigrant, non-native English speaker, and as a middle-easterner, I am also in a position of less power or marginalization. While my identity locates me in a unique position to be able to advocate for marginalized groups, it also means that I need to be aware of blind spots

that are inherent to positions of power. More specifically, this current project, by focusing on use of mobile phone applications, assumes a certain level of technological literacy and access to the internet that may not be the case for certain populations. While these are addressed in the literature review to some extent, it is important to acknowledge these assumptions.

Lastly, this project reflects my commitment towards helping actualize social justice. SAMHSA (2023) explains that trauma is an issue of social justice. This is because populations that experience minority stress or are under-resourced, experience trauma more frequently (SAMHSA). Often, trauma is caused by or exacerbated by racism, sexism, homophobia, poverty, ableism, and genderism (SAMHSA). Therefore, by exploring ways to improve trauma treatment, a step is taken towards social justice.

Definition of Terms

ADDRESSING Framework

A framework that facilitates finding a social location according to ten factors: Age, Developmental or other Disability, Religion, Ethnicity, Socioeconomic status, Sexual orientation, Indigenous heritage, National origin and Gender (Hays, 2001).

Amygdala

A structure located in the temporal lobe of the brain involved in emotional processing, specifically fear and responding to threats (Tranel et al., 2020).

Attrition Rate

Attrition rate is the proportion of users who discontinue participating in the project over time (Hallenbeck et al., 2022).

Cognitive Processing Therapy (CPT)

A treatment model that aims to target maladaptive forms of thinking about self, others, or the world that have resulted from trauma (Rothbaum & Watkins, 2025). CPT is one of the treatments that is strongly recommended for trauma treatment (APA, 2025).

Engagement Rate

Engagement rate is the rate at which users interact with the project (Hallenbeck et al., 2022).

Gamification

Designing games and introducing elements of games and play in contexts that are not primarily based on games (Corthésy-Blondin et al., 2023).

Hippocampus

A structure in the medial temporal lobe of the brain, involved in the retrieval and consolidation of memories, spatial navigation and processing incoming information (Tranel et al., 2020).

Mobile Health (mHealth) Applications

Tools available in smartphones that help provide psychoeducation, monitor or track symptoms, or offer exercises that support mental well-being (Lewis et al., 2016).

Neurotransmitter

A chemical messenger that helps transmit signals from one neuron to another and is involved in regulating mood, stress response, and arousal among other functions (Tranel et al., 2020). For example, serotonin is a neurotransmitter that is key in regulating mood. Therefore, dysregulation of serotonin can lead to disorders such as depression (Tranel et al.). Similarly, norepinephrine, a neurotransmitter involved in the body's arousal and attention, is important in the fight and flight response (Tranel et al.).

Post Traumatic Stress Disorder (PTSD)

PTSD is one of the Trauma- and Stressor-Related Disorders (APA, 2022) that may occur after exposure to potentially traumatic events, and is characterized by intrusion, avoidance behaviours, negative alterations in mood and cognition, and hyper-arousal (APA).

Post Traumatic Stress Symptoms (PTSS)

Symptoms that are related to trauma, such as flashbacks, nightmares, hyper-vigilance, and distress (Corthesy-Blondin et al., 2023).

Prolonged Exposure Therapy (PE)

PE is an intervention that is evidence-based and strongly recommend for treating trauma (APA, 2025). PE uses exposure to traumatic cues in a safe environment to help reduce avoidance and remove maladaptive associations that were formed by trauma, leading to reduced activation (McLean & Foa, 2024).

PTSD Coach

A mobile-phone application that is freely available to the public, designed for individuals who have been affected by trauma or have a diagnosis of PTSD (Owen et al., 2018). PTSD Coach is based on evidence, developed by the U.S. Department of Veterans Affairs, offering psychoeducation and tools to track and manage symptoms, and build support resources (Owen et al.).

Substance Use Disorder (SUD)

A disorder characterized by a pathological pattern that shows use of one or more substances despite problems that arise from it (APA, 2022). These ten classes of substances include hallucinogens, caffeine, alcohol, cannabis, inhalants, and opioids among others (APA).

Systematic Review and Meta-Analysis

Systematic Review is a research method that analyzes and critically evaluates results from multiple studies in a way that is not biased and is replicable (Efron & Ravid, 2019). A meta-analysis is a systematic review that uses statistical analysis to combine the data from multiple studies to find patterns in a larger sample size (Efron & Ravid).

Sympathetic Nervous System

A part of our body's autonomic nervous system, responsible for the "fight-flight" response by increasing heart rate, overall alertness, and breathing rate (Tranel et al., 2020). At the same time, when our body detects danger, this system lowers non-essential functions such as digestion (Tranel et al.). While the sympathetic nervous system is essential in responding to stress and danger effectively, its prolonged or repeated activation can be harmful (Tranel et al.).

Trauma

Defined as an event or series of events that are perceived to be threatening to life, physical or spiritual well-being, and can potentially have long-lasting effects on the individual's mental health and functionality (SAMHSA, 2023).

Trauma-Focused Cognitive Behavioral Therapy (TF-CBT)

A therapeutic model that combines Cognitive Behavioral Therapy with elements of attachment theory, trauma-sensitive factors, and family-based approaches (Cohen et al., 2017). TF-CBT is a phased-approach in which the individual goes through phases of treatment in an order that helps them feel safe and stabilized before processing their trauma and learning to integrate the skills in their lives (Cohen et al.).

Trauma-Focused Therapy

Psychotherapeutic models, such as Prolonged Exposure Therapy and Trauma-Focused Cognitive Behaviour Therapy, that are evidence-based and are recommended for targeting the symptoms of PTSD to help reduce the impact of trauma (Rothbaum & Watkins, 2025).

Outline of the Capstone Project Chapters

While the first chapter provided an overall introduction to the project, the research questions, and my personal reflections on this subject, chapter two and three review the available research and explore the implications for practice and future research. Chapter two is dedicated to a literature review and a synthesis of what the current research shows regarding the use of mobile phone applications in PTSD treatment. By briefly outlining the three recommended treatments for PTSD, this chapter then explores the barriers that individuals or groups of people face in accessing those treatments. Moreover, some barriers that are a result of structural limitations are also named, such as lack of trained specialists. Considering that these barriers lead to negative consequences such as re-traumatization in affected individuals, the chapter explores how use of mobile phone applications can be relied on as an alternative method to fill this gap. The available research includes a variety of studies that have examined use of mobile phone applications differently; as a stand-alone intervention or with the help of health-care professionals. As a result, this chapter will review these studies in two different categories: mobile phone applications as a stand-alone tool and used in conjunction with conventional care. Lastly, this chapter explores the limitations of using mobile phone applications as a tool in providing mental health care and reviews some of the relevant cultural and ethical considerations.

Chapter three aims to build on the literature review and translate the findings into real-world practice. The implications of the studies and their limitations, along with suggestions for

future research are explored. Additionally, based on these implications and findings, several suggestions are made for mobile phone applications that aim to support treatment of PTSD in different individuals. In chapter three a list of criteria is suggested that help evaluate mobile phone applications based on trauma-informed principles (SAMHSA, 2023). Specifically, these criteria can be used to ensure that these applications are in fact in line with what has already been found to be helpful in reducing symptoms of trauma.

Chapter Two: Literature Review

Overview

Since 1980, when Post-Traumatic Stress Disorder (PTSD) was first included in the Diagnostic and Statistical Manual of Mental Disorders III (DSM-III) as a diagnosis, the field of trauma and traumatic stress began attracting more research and attention from both the public and health professionals (McFarlane & Kilpatrick, 2021). Research began to identify different types of traumas, and steps were taken to systematically assess and treat individuals affected by it (McFarlane & Kilpatrick). Throughout the years, several evidence-based treatments were developed and used in dealing with PTSD that showed significant progress (Linardon et al., 2019). However, despite this progress, not all affected individuals are able to access these treatments, and therefore a gap exists between the population that is affected by PTSD and those who receive effective and timely treatment (Linardon et al.).

This chapter aims to briefly explore some of the treatment options for PTSD, followed by some of the potential barriers that exist in accessing them. Having these barriers in mind, some of the available alternative methods are explored. More specifically, studies that have analyzed the use of mobile phone applications that help monitor, manage, and treat symptoms of trauma are discussed. Lastly, existing limitations and gaps that are apparent in the available literature are briefly mentioned.

The Importance of Addressing Trauma

There are several reasons why trauma needs to be addressed, including its rising prevalence, and risks that follow unaddressed trauma. Since the COVID-19 pandemic, the prevalence of PTSD has shown a significant increase (Zhao et al., 2023), suggesting the need for more attention to this disorder. When exposed to a potentially traumatic event or series of events,

a timely intervention can help prevent clinical symptoms of PTSD, or at times, alleviate the symptoms (Brocker et al., 2023). Nevertheless, studies show that between a traumatic experience and receiving appropriate treatment, there is a gap that varies significantly between groups of people, some remaining untreated for several years (Lewis et al., 2016). This, unfortunately, may lead to development of clinical symptoms of PTSD (Brocker et al.). Additionally, traumatic experiences in childhood might increase the risk of further traumatization in the future, negatively affect development, and lead to other disorders such as Substance Use Disorder (SUD) (Briere & Scott, 2015). This is because the significant stress of the initial trauma might motivate the individual to reduce their tension by using drugs or alcohol (Briere & Scott). With these risks, the risk of suicidality and self-harm also increases (Curran et al., 2021).

Overview of Treatment Options

Although many survivors of trauma will not need to receive treatment and will recover over time, some develop long-lasting PTSD, which necessitates receiving treatment (Rothbaum & Watkins, 2025). At the time of writing this paper, Sertraline and Paroxetine are the only medications approved for treating PTSD, while some are being reviewed for approval by the US Food and Drug Administration (FDA) (Rothbaum & Watkins). However, medication or use of medication in conjunction with psychotherapy is not recommended as the first choice of treatment (Rothbaum & Watkins). The recommended options are trauma-focused therapy interventions, which will be briefly discussed. For this paper, the three interventions that have been strongly recommended by the American Psychological Association (2025) for treating PTSD are included. These three treatments, Prolonged Exposure (PE), Cognitive Processing Therapy (CPT), and Trauma-Focused Cognitive Behavioural Therapy (TF-CBT) have all been studied many times in large samples, and show moderate to high effectiveness (APA, 2025).

Prolonged Exposure Therapy

Prolonged Exposure Therapy (PE) is considered to be the first-line treatment for PTSD (McLean & Foa, 2024). PE is based on the understanding that a fear response is a conditioned response towards the traumatic event (Rothbaum & Watkins, 2025) and leads to associations that are not accurate (e.g: loud noise means threat) (McLean & Foa). Therefore, in this therapeutic model, the individual is encouraged not to avoid the fearful situation and instead attempts to actively re-structure this inaccurate association by exposing themselves to it (McLean & Foa). Specifically, the individual is exposed to the fear stimulus while being in a safe space (*in vivo* exposure) and is asked to imagine the feared situation in detail (imaginal exposure) (McLean & Foa). Lastly, the trauma survivor is invited to openly discuss their experience after the exposures (McLean & Foa). Studies show that PE can significantly help reduce symptoms of PTSD and eventually lead to recovery (McLean & Foa).

Cognitive Processing Therapy

Cognitive Processing Therapy (CPT), another recommended treatment for PTSD (Rothbaum & Watkins, 2025), aims to address distortions that form as a result of trauma, and which affect the individual's view of themselves, the outer world, and other people (Rothbaum & Watkins). By identifying and subsequently challenging these distortions, recovery from trauma is facilitated (Rothbaum & Watkins). These distortions could be attempts at meaning making (e.g. "I should have been more alert to avoid this situation") or overgeneralization (e.g. "all people have bad intentions") (Rothbaum & Watkins). CPT uses Socratic questioning and skills to challenge beliefs to overcome these distorted ways of thinking (Rothbaum & Watkins). Having corrected these distorted thoughts, the symptoms of PTSD are reduced, allowing the individual to function more effectively in the society (Rothbaum & Watkins).

Trauma-Focused Cognitive Behavioural Therapy

Trauma-Focused Cognitive Behavioural Therapy (TF-CBT) is an integrative treatment that combines trauma-sensitive strategies with CBT, attachment-based and family interventions, developmental neurobiology, humanistic models, and empowerment models (Cohen et al., 2017). TF-CBT is delivered in three phases: (1) stabilization: psychoeducation about trauma, skills for regulation, and safety planning; (2) trauma processing: gradual work with traumatic memories; and (3) integration: consolidating learning and strengthening communication, safety, and relationship skills (Cohen et al.).

Barriers in Receiving Treatment

There are a number of reasons why individuals may not seek treatments if they have been affected by PTSD and persisting PTSS (Corthesy-Blondin et al., 2023). It is not uncommon for those affected by PTSD to self-medicate and start using substances such as alcohol to help reduce their symptoms, instead of seeking therapy (Curran et al., 2021). Factors such as being concerned about stigma around mental disorders, avoiding potentially activating memories, lack of knowledge about mental health and related services, as well as financial difficulties, can all become significant barriers in accessing treatment (Corthesy-Blondin et al.). Moreover, since PTSD might lead to hypervigilance, especially when faced with trauma-related events, it is understandable that affected persons might be apprehensive in seeking help (Huo et al., 2023). Additionally, although treatments may be readily available, those treatments might not be culturally and socially in line with, or understanding towards, the individual's background (Ng et al., 2025). These barriers might stop a person from seeking treatment on an individual level, however, some other structural barriers are also important to discuss.

From a structural point of view, many barriers exist in providing treatment. For example, insufficient number of facilities and therapists that are trained in providing PTSD treatment (Van Ameringen et al., 2017), especially in primary health care (Possemato et al., 2016) is a major barrier. Moreover, unfortunately, many cases of PTSD are misdiagnosed, or even overlooked by healthcare professionals, which prevents treatment seekers from accessing the right treatment (Schellong et al., 2019). Additionally, insufficient funding in the relevant healthcare sector, and long waitlists are some other structural issues that limit providing appropriate and timely treatment (Owen et al., 2018). Lastly, some barriers stem from limitations that therapists may have, such as receiving specialized trainings that are costly and time consuming (Finch et al., 2020; Siddaway et al., 2022). Providing treatment for PTSD can be emotionally heavy for therapists, leading many therapists to avoid receiving training in or offering this type of treatment (Shakespear-Finch et al., 2020).

When an individual who suffers from PTSD is faced with barriers in receiving the right treatment, they can potentially be re-traumatized, especially when lack of choice, autonomy and having a sense of control is a part of their traumatic memory (Huo et al., 2023). Considering that these barriers exist, and that the need for receiving treatment continues to grow, alternative options have also been introduced that include self-help methods, with or without support from professionals (Siddaway et al., 2022).

Alternative Ways of Addressing Trauma

Given these persistent barriers, researchers have explored alternative approaches. In the year 2000, the first evaluated and formal digital tool to help alleviate PTSD symptoms was developed in the Netherlands, called “Interplay” (Lewis et al., 2016). While this new tool showed promise in treating symptoms that are sub-threshold in diagnosing PTSD, it was not

evaluated in the clinical population who had a confirmed diagnosis (Lewis et al.). Ng and colleagues (2025) conducted a systematic review of digital tools used as mental health interventions. Their findings show that since 2015, when online platforms became more widely used as a self-help approach for PTSD, additional digital resources, such as mobile applications, audio files, online storytelling, and virtual reality, have been introduced to support mental health difficulties. These tools offer to overcome the barriers that exist for in-person and conventional therapy, hence making access to therapy less problematic (Siddaway et al., 2022). For example, Lewis et al. (2016) found that use of an internet-based intervention, with the help of up to only three hours from a therapist, helped reduce PTSD symptoms significantly, even after one-month follow-up.

Based on these tools, it is expected that delivery of therapeutic intervention will undergo significant changes in the coming years (Linardon et al., 2019). Therapy would not be limited by the users' geographical location, availability of therapists, and they can possibly better ensure anonymity and confidentiality (Linardon et al.). While there are number of different digital tools available for PTSD, such as internet-delivered CBT (Andersson et al., 2019; Lewis et al., 2019), Trauma-Informed Self Help Guide (TF-SHG) (Siddaway et al., 2022), and digital story-telling (Ng et al., 2015), this essay aims to explore mobile phone applications, in part due to their wide use in the society.

Mobile Applications for PTSD

The available research about use of mobile applications in treating or managing the symptoms of PTSD vary significantly in their methods and evaluation criteria. For example, while some studies have evaluated use of these applications as a stand-alone intervention (e.g. Cernvall et al., 2018; Hallenbeck et al., 2022; Linardon et al., 2019; Weisel et al., 2019), others

have evaluated these apps as an additional tool used in conjunction with conventional therapy (e.g. Ng et al., 2025; Possemato et al., 2023; Reger et al., 2017; Strodl et al., 2020). Additionally, some studies evaluated these applications both as a stand-alone method, as well as a tool used in therapy (e.g. Davis et al., 2024; Owen et al. 2018; Reyes et al., 2025). In general, smartphone applications can be very helpful in delivering treatment for several reasons, including their ubiquity, availability at nearly all times, and their desirability (Owen et al., 2018). These applications can be also used as a tool to monitor and track symptoms in real time, as well as a means to complete tasks in-between therapy sessions (Owen et al.)

A specific mobile application that has attracted a lot of attention from researchers and mental health professionals is the PTSD Coach application, developed by the US Department of Veterans Affairs National Centre for PTSD (Hallenbeck et al., 2022). PTSD Coach was first designed in 2009 by a group of psychologists who aimed to create a web-based product to deliver psychoeducation and skills for managing symptoms, specifically for veterans who were diagnosed with PTSD (Owen et al., 2018). This initiative was in response to the feedback provided by the veterans, and by 2011, this application was released to the public via mobile app stores (Owen et al.). This application is freely available to the public and has published evidence in alleviating symptoms of PTSD (Van Ameringen et al., 2017).

Since the release of the PTSD Coach application, it has been studied many times (e.g. Hallenbeck et al., 2022; Hensler et al., 2023; Hensler et al., 2022; Owen et al., 2018), and different countries developed their own version of this application, including Sweden (Cernvall et al., 2018) and Australia (Strodl et al., 2020). A recent study showed that over 64% of users are introduced to this application by their healthcare provider, and more than 90% find it helpful (Reyes et al., 2025). Apart from PTSD Coach, several other applications have also been studied,

which will be explored below. For a clearer image of the current literature, this essay will review these studies separated by how they evaluated these applications: stand-alone and in conjunction with therapy.

Mobile Applications as a Stand-alone Intervention

Two different meta-analysis studies showed limited effectiveness for applications that offer to treat PTSD. A systematic review and a meta-analysis by Weisel et al. (2019) reviewed use of applications designed for mental health. Their review shows that while these applications can have a number of positive aspects such as being accessible, they do not have significant effects (Weisel et al.). Specifically, their systemic review included two randomized control trials (RCT) that evaluated the effectiveness of treating PTSD, both of which showed no significant improvement. Another meta-analysis, analyzing 66 RCT studies, showed that while these applications showed promise in lowering the level of anxiety and depressive symptoms, they had limited effects on PTSD symptoms (Linardon et al., 2019).

While these two meta-analyses found limited effects, both papers included their analysis of potential reasons for this finding. In the first study, Weisel et al. (2019) found that technical issues, the size of the mobile screen, software updates, and low battery life could negatively affect the usage of these applications. Moreover, in the second study, it was speculated that this limited effect could be due to the application's low quality of content (Linardon et al.). Similar to these, another meta-analysis that reviewed the effectiveness of mobile applications in treating PTSD in children and adolescents showed no significant benefit in using these applications (Schulte et al., 2024). However, the authors note that none of the included studies used applications that were based on trauma-informed practices, which could have affected the results (Schulte et al.).

Hallenbeck et al. (2022) conducted a study in which they evaluated the PTSD Coach application's use and impact, in both iOS and Android users, making up a total of 128,691 users. The researchers monitored their use of different parts of the application (including Self Management, Learn, Safety Plan, and Get Support), and included two PTSD in-app assessments for the users to complete. In their study, the part of the application that was used most by users was "Manage Symptoms", where coping skills are introduced (Hallenbeck et al.). The study further showed that those who used this application to manage their symptoms reported lower distress scores after use, initially showing an average score of 6.03 on a scale of 0-10, which decreased by 1.38 points (Hallenbeck et al.). Overall, 15% of those users who completed the two assessments experienced improvements that were found to be clinically significant according to the DSM-5-TR PTSD checklist (Hallenbeck et al.). It is important to note that over the one year study, 13.67% completed at least one assessment while only 3.88% of users completed two assessments (Hallenbeck et al.). Therefore, not all users completed both assessments, and the results are limited to those who remained engaged with the application throughout the study.

Similarly, the Swedish version of this application was evaluated, noting that it was developed based on the English version's source code (Cernvall et al., 2018). In this study, the authors assessed the user's perception of the application in terms of its usefulness and measured the difference of the user's PTSS before and after using the application for the period of four weeks. To be included in the study, all participants had to have experienced a traumatic event in the five-year period prior to the study (Cernvall et al.). Among the eleven participants, nine met the diagnosis for PTSD, and the results showed no significant improvement of PTSD symptoms (Cernvall et al.). Nevertheless, in the interviews conducted, the participants found the application to be moderately helpful (Cernvall et al.). Importantly, the authors note that the study was limited

due to the participants' lack of active engagement with the application and highlighted the need for a controlled study for more accurate and reliable results (Cernvall et al.).

Considering the need for a controlled study, Hensler et al. (2023) conducted a longitudinal RCT in which they compared participants who used the PTSD Coach application, with a control group who remained on the waitlist. They found that the application reduced PTSD symptoms after three months of consistent use (Hensler et al., 2023). Additionally, in their 9-month follow-up, PTSD symptoms continued to decrease (Hensler et al., 2023). Importantly, another similar study had shown that while the PTSD symptoms showed a reduction after using PTSD Coach, the somatic symptoms of PTSD remained the same (Hensler et al., 2022).

Other mobile applications have also been studied to find their effectiveness in recovery from PTSD. For example, Grant et al. (2025) explored the effectiveness of four different applications, all based on EMDR, and told their participants to use any of the four applications on an "as-needed" basis for three months. The four applications together were called the Healing Trauma App Series, and each one focused on one of these factors: anxiety, problems with sleep, identity struggles, and somatic symptoms (Grant et al.) Participants who used the applications based on their need showed a moderate decrease in PTSS (Grant et al.). The authors noted that a high rate of drop-out was the limitation of their study (Grant et al.).

Some mobile applications have been designed based on theoretical foundations other than EMDR. For example, a study of 221 participants compared the effects of using an application based on Acceptance and Commitment Therapy (ACT) with another application based on providing mindfulness practices, and with a group that received no treatment (Zhao et al., 2023). Based on their pre- and post-use assessments, both groups that used the applications (ACT or mindfulness) showed significant improvement compared to the control group with no treatment

(Zhao et al.). Importantly, groups that were assigned to the ACT application had a lower drop-out rate compared to the mindfulness group, as well as slightly better improvements (Zhao et al.).

Seeking Safety is another application that focuses on skill building to help recovery from PTSD, especially for individuals who have resorted to substance use to alleviate symptoms of PTSD (Najavits et al., 2024). This application is based on Cognitive Behavioural Therapy (CBT) and includes a platform for connection between users to share their experience, psychoeducational content, tracking level of safety and visual exercises in regard to safety (Najavits et al.). Their study compared the levels of PTSD symptoms between two groups; one group that used the Seeking Safety application (SS group), and a group that used a control app that included the text of the psychoeducational content only and lacked all other engaging elements of the application (control group) (Najavits et al.). The SS group showed lower levels of PTSD symptoms compared to the control group (Najavits et al.). This further supports the efficacy of using evidence-based applications that successfully engage the users to manage symptoms of PTSD. Similarly, Davis et al. (2024) showed that increasing the user engagement increases the effectiveness of the application. In this study, the researchers evaluated an application that included games based on “exposure therapy” and found that higher engagement with these games was correlated with further reduction in PTSD symptoms (Davis et al., 2024).

Overall, Hensler and colleagues (2023) argue that while use of mobile phone applications, without any guidance, does not replace therapy, having access to them and using them is more beneficial to no intervention at all. This can be specifically helpful if access to help is not available, such as in pandemics or other similar circumstances (Hensler et al.).

Mobile Applications in Conjunction with Therapy

In addition to the studies mentioned above, some research evaluated the effectiveness of mobile applications when used in conjunction with therapy, or when paired with a therapist's support in general. For example, a study compared the effectiveness of the PTSD Coach application when used with a clinician's support and guidance, to treatment as usual in primary care (Possemato et al., 2023). The authors found that even though the first two groups did not differ in how the clinicians rated subjects' PTSD symptoms, the group that used the application showed more satisfaction with their therapy (Possemato et al.). Moreover, their self-report measurements showed lower severity of symptoms compared to treatment as usual (Possemato et al.). In line with this finding, higher engagement with therapy was reported in a study that examined the effectiveness of PTSD Coach when used in conjunction with therapy (Strodl et al., 2020). Overall, it appears that using PTSD Coach supported the tasks of ongoing therapy and improved clients' engagements (Strodl et al.). Consistent with this finding, when users of PTSD Coach were interviewed, many suggested that this application is best described as an additional tool in therapy, compared to a stand-alone therapeutic intervention (Shakespeare-Finch et al., 2020). In another study, the effectiveness of the PTSD Coach application was compared when used independently versus with a clinician's support (Possemato et al., 2016). It was found that both groups showed significantly lower PTSD symptoms, while the group that also had a clinician's support showed greater benefits and lower symptoms (Possemato et al.).

PTSD Coach could also be used as the primary focus of therapeutic sessions, as opposed to functioning as a supplementary material in-between sessions (Brocker et al., 2024). In their study, Brocker and colleagues (2024) helped the participants install the PTSD Coach application and completed four weekly sessions centered around its modules. The application was used to create session agendas, guide skills practice, facilitate use of the application, and inform

homework assignments (Brocker et al.). By comparing pre- and post-treatment PTSD severity, they found this approach to be beneficial in lowering PTSD symptoms, particularly in the 3-month follow-up (Brocker et al.).

Apart from the effectiveness of the mobile applications in treating PTSD, Reger et al. (2017) found that when these applications are used in conjunction with therapy, it helps adherence to the therapeutic protocol. Therefore, these applications could help boost the therapists' competence in delivering therapy (Reger et al.).

Limitations of Mobile Applications in Delivering Treatment

Similar to any other intervention, it is not surprising that use of mobile applications have some limitations in providing therapeutic interventions. For example, when users of PTSD Coach application were interviewed by Shakespeare-Finch et al. (2020), many stated that in the state of high emotional arousal it is not reasonable to expect users to read texts or be expected to fully understand them. During this state, the content may appear as black and white words, with no meaning (Shakespeare-Finch et al.). In addition, in the same study, some users reported that the assessment could intensify their distress and might lead them to label their symptoms as PTSD without a professional evaluation. Some other limitations included the requirement for high technology literacy, and that it added to the stigma due to its name being "PTSD Coach" (Shakespeare-Finch et al.). Moreover, some of the clinicians who used mobile applications in their work with clients reported that application bugs, necessary updates, and technical problems in general can be barriers (Reger et al., 2017), especially for older adults (Strodl et al., 2020).

Another limitation that many studies noted was high rates of attrition and low engagement (Corthesy-Blondin et al., 2023; Grant et al., 2025; Hallenbeck et al., 2022; Zhao et al., 2023). In a systematic review of studies that examined the subjective experience of users,

Corthesy-Blondin and colleagues found that the main limitations from the users' perspectives are low levels of perceived benefits, application design, technical problems, not being familiar with the technology, and being concerned about stigma and privacy. In addition, some reported having their symptoms increased and experienced acute anxiety while reading the text (Corthesy-Blondin et al.).

While mobile applications might lower the threshold to accessing evidence-based treatment, they just as easily open the way to access harmful content (Linardon et al., 2019).

While there are numerous mobile applications that claim to help assess and treat symptoms, not all of them are evidence-based, or even if they are, they have not been adequately evaluated (Van Ameringen et al., 2017). In their study, Van Ameringen et al. found applications such as the T2 Mood Tracker that is not based on evidence, nor has it been evaluated; nonetheless, it is publicly available. Even though it is common for Mental Health Applications (mMHealth) to undergo RCT's, many mobile applications are published without any research, potentially causing harm (Schellong et al., 2019).

In addition, even though a mental health application might be based on published evidence, regular updates to the application might change the content, hence the need for new evaluations (Hallenbeck et al., 2022). This suggests that with every update to the software, it might be necessary to complete evaluations to ensure their effectiveness (Hallenbeck et al.). Furthermore, while many applications are based on an evidence-based modality such as CBT, translating the foundations of CBT into an application might change the properties of the intervention (Van Ameringen et al., 2017). For example, the texts might become summarized, affecting its content and psychometric properties (Van Ameringen et al., 2017).

Collectively, several patterns seem to emerge from the limitations outlined above. Namely, while the mobile applications seem to facilitate the initiation of receiving treatment, they often fail to successfully maintain engagement (Grant et al., 2025; Hallenbeck et al., 2022). This, according to above studies, could be due to various reasons, such as the difficulty of connecting with words or lack of a clinical judgment, that point to a missing human connection. As a result, it is reasonable to assume that absence of a therapeutic alliance is a limitation of mobile applications aiming to address PTSD symptoms.

Ethical and Cultural Considerations

Confidentiality

The first principle of the Code of Ethical Conduct (British Columbia Association of Clinical Counsellors (BCACC), 2023) is Respect for the Dignity of all Persons. A factor in this principle is maintaining client confidentiality and respecting their privacy (BCACC). Data security, especially in online platforms where clients exchange messages with others, and track their progress, becomes a sensitive and relevant concern (Andersson et al., 2019). Breach of data has been mentioned as one of the concerns mentioned by users (Corthesy-Blondin et al., 2023). While the legal requirements for health data are ever evolving, these data sets are legally required to meet high standards, the same as those required for online banking (Andersson et al., 2019). Nevertheless, this remains a concern that users might share. It is important to address confidentiality issues when developing applications related to mental health, which will be discussed more in chapter three.

Managing Risks

In line with the Code of Ethical Conduct (BCACC, 2023), responsible caring entails risk management in order to prevent any harmful or incompetent practice that might affect

individuals or their relationships in a negative way. Considering that some of these mobile applications have limited or no evidence (Van Ameringen et al., 2017), it becomes necessary to consider and weigh the risks before integrating their use in practice (Linardon et al., 2019). Moreover, to ensure responsible caring, risk management must also account for the possibility of re-traumatization as a result of using these applications. Studies report that this can occur even with evidence-based applications (Corthesy-Blondin et al., 2023). Therefore, mental health professionals who aim to use these applications in their practice, or policy makers who monitor and evaluate these applications are to be cautious in choosing the specific application with minimum risks.

Cultural Considerations

Importantly, systematic reviews such as the study by Lewis et al. (2019) show that most studies are completed in the United States or Western Europe and underrepresent other cultural backgrounds. Moreover, in their review, most participants were employed and had high levels of education, potentially limiting the generalizability of findings in how effective PTSD Coach can be (Lewis et al.). It becomes necessary to replicate these studies in other samples, with other levels of education, socio-economic status, and cultural backgrounds in order to have a clearer image of these applications' benefits. For example, the PTSD Coach application in Australia was modified to include metaphors and vocabularies that are specific to Australia, with the audio recordings being recorded with an Australian accent (Shakespeare-Finch et al., 2020). Therefore, it is important to note that while an application might show effectiveness in one population, it may be less effective in another.

While mental health applications such as PTSD Coach and AnxietyCoach are based on evidence-based interventions (Alderson, 2020), it is important to note that those interventions

might themselves require cultural adaptations (Benjamin et al., 2025). For example, even though PE, CPT, and TF-CBT are treatments of choice for PTSD, they might still need to be evaluated for minority groups (Benjamin et al.). In their systematic review, Benjamin et al. found that using culturally sensitive metaphors, values and meanings improves the effectiveness of these interventions with cultural minority groups. Importantly, they also found that while some adaptations to interventions have been implemented for these groups, little or no changes have been made to the assessments (Benjamin et al.). Therefore, while these mobile applications might be accessible to nearly all, their assessments might not be applicable to everyone.

Gaps in the Literature

Several gaps can be identified in the research, including lack of a consistent methodology. In their systematic review of digital interventions, Ng et al. (2025) reviewed studies, some of which were included in this chapter. It was found that each study used a different method for evaluation, leading to an inconsistency across methodology (Ng et al.). While some used questionnaires based on DSM-5-TR (Hallenbeck et al., 2022; Lewis et al., 2016), others relied on other self-report questionnaires (Cernvall et al., 2018; Grant et al., 2025; Zhao et al., 2023), and some included clinicians' ratings (Davis et al., 2024; Owen et al., 2018; Possemato et al., 2023). One of the studies that compared self-reported effects and clinician's reported effects of using the PTSD Coach application, found that while clinicians reported no significant difference, the users did find an effect (Possemato et al., 2023). Therefore, even though the studies might be similar, they might be measuring different factors, limiting their validity and reliability.

Another inconsistency between studies that used the applications with some guidance from a clinician, is the varying degrees of input from the clinicians (Siddaway et al., 2022). For example, while in a study by Lewis et al. (2016) users received only up to three hours of

guidance, in another study, the application was used in-between full sessions with a therapist (Strodl et al., 2020). The varying amount of input from a clinician might affect the effectiveness of the application.

Another difference found between various studies, is how they have characterized the applications; as a treatment method (e.g. Lewish et al., 2016), or as an assessment tool (e.g. Strodl et al., 2020). Depending on how these applications are characterized, their effectiveness would be defined and measured differently.

Another gap that becomes apparent in reading the studies is the over-representation of certain populations and underrepresentation of others (Siddaway et al., 2022). For example, studies mainly include female adults, and focus less on males, youth, and older adults (Brocker et al., 2023; Siddaway et al.). Therefore, it remains unknown as to how generalizable these findings are to the general public. It has also been noted that studies were conducted in countries with higher-income populations (Brocker et al.), likely further limiting the findings.

Overall, the gaps in literature show significant inconsistencies in how these applications are evaluated. A lack of a standardized evaluation tool has led to studies measuring potentially different factors, making it more difficult to conclude whether the applications are beneficial. Therefore, it would be beneficial to have a consistent evaluation tool to facilitate exploring the extent of these applications' adherence to trauma-informed principles. This would be a step forward towards addressing the inconsistencies of the studies outlined above. Consequently, the following chapter attempts to use the trauma-informed principles by SAMHSA (2023) to develop a list of criteria to be used for an evaluation tool.

Summary and Synthesis

Overall, this chapter briefly explored recommended treatments for PTSD, including PE, CPT, and TF-CBT (Rothbaum & Watkins, 2025). While these treatments have shown promise in providing treatment (Rothbaum & Watkins), there seems to be a gap between those who have been diagnosed with PTSD and those who receive PTSD treatment (Corthesy-Blondin et al., 2023). The gap that exists between suffering from PTSD to receiving evidence-based treatment not only has risks of worsening the individual's functioning and wellbeing but also increases their loneliness in their experience (Briere & Scott, 2015). The barriers that have caused this gap to exist in different levels; some affect the individual affected by PTSD, some are structural, and others affect therapists providing treatment (Corthesy-Blondin et al., 2023; Schellong et al., 2019; Van Ameringen et al., 2017).

One way to overcome the barriers in accessing treatments for PTSD is designing mobile phone applications that help treatment for PTSD, since they are widely used and available mostly at all times (Owen et al., 2018). This capstone focuses on exploring the usage and effectiveness of such mobile phone applications, and reviews some of their limitations and possible implications for the future.

One of the most studied applications for PTSD is PTSD Coach, which has been designed by the US Department of Veterans Affairs and has been modified for use in Australia and in Sweden (Cernvall et al., 2018; Strodl et al., 2020). While some studies showed no significant difference in PTSD symptoms (Weisel et al., 2019), others found that using this application increased users' satisfaction and lowered PTSD symptoms (Cernvall et al., 2018; Hallenbeck et al., 2022). The different findings seemed to be rooted in different methodologies and measuring factors, underscoring the need for better controlled and more consistent research in the future.

Other mobile phone applications were also studied, and have shown moderate effectiveness in treating PTSD symptoms (Najavits et al., 2024; Zhao et al., 2023), especially when these applications show higher rates of user engagement and desirability (Davis et al., 2024). Even though some clinicians did not find any difference in PTSD symptoms before and after using these applications, users themselves perceived benefits and found them to be helpful (Possemato et al., 2023). Importantly, while many other applications exist, not all of them have been scientifically examined, or have not been based on evidence (Van Ameringen et al., 2017).

Another important factor in studying mental health mobile applications is their use as either a stand-alone intervention or in conjunction with conventional therapy. It appears that both ways show benefits for users; while some believe that these applications are to be used as an additional tool in therapy (Shakespeare-Finch et al. 2020), others have found them beneficial when used as a stand-alone tool (Najavits et al., 2024; Zhao et al., 2023).

Overall, the available literature shows both benefits and limitations in using mobile applications in treating PTSD. This highlights the need for further research that is more methodologically consistent, culturally inclusive and better controlled. Addressing these gaps can help ensure safety and effective use of mobile applications in helping individuals affected by trauma. Having reviewed the literature on barriers to accessing PTSD treatment and the use of mobile applications to address them, it is important to examine the implications of using these alternative approaches. The next chapter aims to explore possible implications of using mobile phone applications, along with suggestions for future research and practice. Specifically, the next chapter suggests a framework to assess applications based on trauma-informed principles (SAMHSA, 2023), with the aim of promoting consistency and efficiency.

Chapter Three: Implications in Practice and Research

The worst part of holding the memories is not the pain. It's the loneliness of it.

— Lois Lowry, *The Giver*

While moderate benefits have been shown for mobile phone applications in addressing PTSD symptoms, the evidence base is limited by substantial heterogeneity in study designs, outcome measures, samples, and conclusions. It is therefore reasonable to remain cautious when making a conclusion about the overall efficacy of PTSD applications.

Throughout the first and the second chapters it became apparent that the studies and applications lack a consistent structural backbone. Applications are built differently, are based on different modalities and have been evaluated differently. While PTSD Coach appears to be based on skills, knowledge, and connection (Hallenbeck et al., 2022), Seeking Safety strictly uses CBT (Najavits et al., 2024), and the Trauma App Series are all based on EMDR and Exposure Therapy (Grant et al., 2025). In this set of circumstances, it becomes more difficult to draw conclusions or understand the overall pattern of use of mobile phone applications. Lack of consistency has been noted in systematic studies such as Ng et al. (2025). More importantly, how these applications were evaluated differed in each research making it more difficult to draw conclusions from the literature review. For example, while some used interviews, others used the application's user engagement, or quantitative measurements (Owen et al., 2018; Possemato et al., 2023). In this chapter, after exploring the implications of the reviewed literature, a list of criteria for a consistent trauma-informed evaluation method for mobile phone applications that target PTSD is presented.

Target Population and Appropriate Use

While mobile phone applications may not be the best choice for all populations, they might be beneficial for certain populations. Studies show that young women are specifically prone to adopting unhelpful coping mechanisms and self-soothing behaviours such as alcohol and drug use (Curran et al., 2021). Therefore, a trauma-informed application may specifically be helpful for this population in order to prevent seeking help through maladaptive coping mechanisms. Moreover, another population that might benefit from these applications are those who have less severe PTSD and who may not meet the threshold for receiving mental health care as much as those with more severe symptoms. Lewis and colleagues (2019) found that internet-based interventions are more useful for this population, as it has a less significant effect compared to face-to-face therapy. In line with this, it is suggested that the PTSD application be used more in primary-care (Possemato et al., 2022). Even though mobile applications do not meet the efficacy level of face-to-face therapy for PTSD, they are superior to no intervention at all (Hensler et al., 2022). For this reason, they can be beneficial at times where the health-care resources are unavailable or overwhelmed, such as pandemics or other types of disasters (Hensler et al.).

Considering the above, clinicians and mental health professionals could recommend appropriate applications to provide care to individuals with low-intensity symptoms, or those who do not meet the threshold for a diagnosis. In individuals with more severe symptoms, these applications may be used as a “companion tool” rather than a stand-alone intervention. This is because of the studies that suggest high drop-out rates in using them (Hallenbeck et al., 2022). Lastly, it may also be appropriate for these applications to be suggested as a maintenance tool to

be used after completing a therapeutic intervention, as a way to remember and to continue practicing skills.

Limitations in Applying the Findings

Research shows that psychological interventions are built on a foundation of a strong relationship between the client and the therapist (Cuijpers et al., 2019). When a safe and trusting relationship has been established between them, specific techniques are used to bring about change and acceptance (Cuijpers et al.). Mobile applications, by nature, do not provide the same opportunity for human connection. This can be specifically problematic for those whose relationships are suboptimal (Cuijpers et al.). Therefore, this further suggests that while mobile phone applications can be helpful in some aspects of recovery from PTSD, they may not be helpful as a stand-alone intervention.

Another limitation found in using these applications are their low user engagement levels (Corthésy-Blondin et al., 2023). Users of mobile phone applications that attempt to address post-traumatic stress have reported that they are not easy to use, and therefore they perceive the benefits to be low (Corthésy-Blondin et al.). Based on the received feedback, customization and gamification are two things that could potentially help boost user engagement (Corthésy-Blondin et al.). Therefore, developing applications that have the option to be customized by users according to their needs and preferences as well as including gaming elements in the applications could help improve user engagement. For example, contents could be presented through puzzles with rewards, or through other games that encourage user engagement by scores.

Criteria for Trauma-Informed Evaluation of Mobile Applications

To address the inconsistency across the evaluative measures for PTSD mobile apps, this capstone proposes a set of criteria that preserves existing mobile mental-health standards while

explicitly aligning them with SAMHSA's (2023) trauma-informed care principles. Schulte and colleagues (2024) note that for PTSD applications to be effective it is important for them to be trauma informed. The reason for choosing the SAMHSA principles of trauma-informed care is the evidence supporting their efficiency when working with trauma (Goldstein et al., 2024). In their systematic review of 16 studies, Goldstein and colleagues evaluated whether using SAMHSA's Trauma-Informed Care principles increased the level of safety and helped prevent re-traumatization. They found that in the field of healthcare in general, SAMHSA's guidelines help actualize and operationalize trauma-informed care in an effective way (Goldstein et al.). Therefore, it is reasonable to use SAMHSA as a guiding reference to help increase the consistency of application of mobile applications that aim to effectively help PTSD. Should these applications follow these principles, it is more likely for them to effectively help prevent re-traumatization, promote safety, and therefore be more efficient.

It is important to acknowledge that the Mental Health Commission of Canada's Assessment Framework (MHCC) (2023) provides comprehensive evaluation criteria for Mental Health Apps in general. Therefore, the current framework, informed by trauma-informed principles (e.g., Safety, Trustworthiness & Transparency), can be an addendum to be used for applications that specifically target PTSD. If successful, this will help promote consistency in different PTSD applications and facilitate their evaluation and increase their effectiveness accordingly. MHCC (2023) assesses seven overarching subjects in an application, which are: Data, Clinical Evidence, Clinical Safety, Usability and Accessibility, Security and Technical Stability, Cultural Safety - Social Responsibility and Equity, and Enhanced Data Sovereignty (MHCC). Within each of these seven subjects, this framework has listed questions that must be

considered when evaluating an application. For example, under “Data”, one of the questions is: “what type of data is collected by the app?” (MHCC, p. 10).

While these criteria are comprehensive and useful, they are not specifically designed to assess the applications’ adherence to trauma-informed principles. The suggested list below could help complete these criteria to include specific questions for PTSD applications. Each question could be answered on a scale of 1 (not addressed), 2 (addressed to some extent), 3 (sufficiently addressed). Based on this method of scoring, higher scores show greater adherence to trauma-informed care.

New Criteria for PTSD and Trauma Applications

In the first chapter, the six principles of trauma-informed care were introduced: Safety, Trustworthiness and Transparency, Peer Support, Collaboration and Mutuality, Empowerment, and Cultural, Historical and Gender Issues (SAMHSA, 2023). In addition to these six principles identified by SAMHSA (2023), based on the literature review and its findings in chapter two, two extra criteria are suggested in this chapter that could improve engagement with PTSD-focused mobile applications.

Safety

Safety is the most important and fundamental aspect that needs to be established in a trauma-informed service (SAMHSA, 2023). One of the indications of safety is predictability (SAMHSA). Based on this, it is important to avoid unnecessary sudden updates, or updates that change the application’s appearance entirely. Other indications of safety include showing respect, inclusivity, and boundaries (SAMHSA). Safety in this context also means minimizing the risks and giving control to the individual (Parker & Johnson-Lawrence, 2022). Based on these indications, safety criteria could be as follows:

- Does the application give sufficient notice about upcoming updates? This question will help avoid unpredictable changes that could lower safety.
- Is it ensured that updates are limited to necessary changes? In order to minimize lack of predictability, this question aims to address unnecessary updates.
- Does the application address minority stress and use an inclusive language? Applications that aim to provide safety need to be aware of and sensitive to minority stress, and avoid re-traumatizing clients who have already experienced oppression and isolation.
- Does the application provide the user with a choice as to what it can have access to on their device? If applications get access to users' devices and data without their consent, this would be construed as disrespectful towards the users' boundaries. As mentioned above, respecting boundaries is an indication of safety (SAMHSA, 2023).
- Does the application provide the user with control over the settings as much as possible? Giving the option to control settings avoids unpredictable changes that might take place.
- Are the applications available to download from well-known and safe platforms? This question helps avoid opening pathways for applications that might include viruses.

Trustworthiness and Transparency

The second principle of trauma-informed care ensures that individuals are clear about the services being provided to them, and that their trust will not be violated (SAMHSA, 2023).

Parker and Johnson-Lawrence (2022) explain that to actualize trustworthiness and transparency,

decisions and strategies need to be thoroughly and clearly explained to the individuals.

Considering the importance of transparency and avoiding any hidden factors, the following criteria may be used:

- Are the terms and conditions of the application easily accessible and understandable? This question ensures transparency of the application's agenda and conditions that the users agree to.
- Are the terms and conditions comprehensive? To ensure that no hidden terms and conditions exist, trauma-informed applications must avoid lack of transparency in their terms and conditions.
- Do the marketing strategies represent the application truthfully? This question helps promote trustworthiness, specifically about the content, agenda, and usage of the application. Should users find the applications to be different compared to the information they were given beforehand, broken trust is to be expected.
- Does the application ensure not to collect, store and share data without the user's consent? Sharing data without consent is another factor that would negatively affect users' trust and lower the level of trauma-informed practice.
- Does the application provide clear instructions on how to use it? Transparent instructions could be another indicator of trauma-informed practice, avoiding elements in the application that could be difficult to follow or understand.

Peer Support

The third principle of trauma-informed care addresses the importance of peer support (SAMHSA, 2023). Based on this, when providing care for PTSD and other forms of trauma, individuals benefit from building safe and mutual relationships that are created voluntarily and

based on trust (Parker & Johnson-Lawrence, 2022). For an application to be trauma-informed, the availability of peer support could be measured by using the following criteria:

- Does the application include the option to connect to other users, or create an option for community building? This question helps promote community building and peer support, which have been proved beneficial in working with trauma (SAMHSA, 2023).
- Does the user have a clear choice whether to be connected with others? Can this choice be easily changed? This question helps avoid harmful and non-consensual relationships, which would negatively affect the users' experience (Parker & Johnson-Lawrence, 2022).
- Does the application provide information about the user's available community support in their area? This question ensures that the users are aware of the option for community support.
- Are all users' identity verified in order to avoid fake users, which can lead to misleading relationships? Community support and peer relationships are only effective if they are genuine (Parker & Johnson-Lawrence, 2022). Therefore, this question helps avoid harmful relationships.

Collaboration and Mutuality

Addressing power imbalances and attempting to balance those are important parts of providing trauma-informed care (SAMHSA, 2023). Parker and Johnson-Lawrence (2022) note that this aspect is specifically important in decision making. Therefore, a trauma-informed application should also ensure to address any power imbalances that may present themselves. Criteria in this section could potentially be:

- Does the application allow the user to customize certain aspects of the application? For example, can the appearance or the order of different sections be chosen by the user? By ensuring the users' collaboration in how the application appears and functions, the user might experience greater mutuality.
- Can the user easily change the application's settings as much as possible? Beyond the application's appearance, the settings could include the users' input in order to increase the level of collaboration. Moreover, having the power to change settings reduces the power imbalance that might exist otherwise.
- Can the user add their own thoughts and notes? Providing a space in which the user can directly provide their input is another way to ensure collaboration.
- Does the application allow the user to remove their data or the application whenever they choose to? Not being able to undo settings, or remove data, may contribute to a power imbalance. Specifically, should the user be unable to remove their input, notes, data, and information from the application they may feel powerless, leading to even more power imbalance and therefore lack of safety.

Empowerment, Voice, and Choice

To promote empowerment, strengths need to be acknowledged and given space (Parker & Johnson-Lawrence, 2022). Therefore, for applications to be trauma-informed, there needs to be space for the users' strengths and abilities to also play a role. For example, the application should help the user identify their strengths and provide explicit feedback to them. For example, if there are tasks and homework involved, the user could report how they completed the task, which could help identify their strengths over time. This could inform the following tasks and content, especially tailored to make use of the users' strength. It is reasonable to assume that with use of

Artificial Intelligence (AI) this customization may be possible. Based on these considerations the criteria for this principle could be:

- Does the application have the option to customize the user's experience? With having the option to customize tasks and content, the application has the opportunity to shape those in a way that promotes the users' strengths. For example, should the user be comfortable and skillful in mindfulness, it might include this skill at the beginning of more difficult tasks.
- Does the application have a dedicated space for providing feedback to the user? After ensuring that the application can be customized, the developers need to program the application to detect and utilize the user's strengths.
- Does the application have a strength-based approach? The other parts of the application, such as psychoeducation and real-life examples can also promote a strength-based view.

Recognizing Issues Related to Culture, History, and Gender

The last principle in trauma-informed care according to SAMHSA (2023), is attending to issues that arise from cultural, historical and gender identities. Importantly, addressing historical trauma and avoiding stereotypes are key in understanding the individual's experience and adhering to this principle (Parker & Johnson-Lawrence, 2022). This is in line with how the DSM-5-TR views issues related to culture when working with PTSD (APA, 2022). The DSM-5-TR notes that cultural, occupational, and demographic factors not only shape an individual's level of exposure to trauma but also influences their risk of developing PTSD when faced with similar traumatic events. Therefore, being attentive to these factors is crucial when developing an application that targets PTSD.

- Does the application avoid stereotypical inferences when providing real-life examples, metaphors, and generally in their content? SAMSHA (2023) states that historical and systematic trauma can make a person more vulnerable to re-traumatization. Therefore, by being aware of examples, tasks, and metaphors that could lead to re-traumatization, they could be avoided more effectively.
- Does the application provide psychoeducation about the effects of historical trauma and systematic oppression? Similar to above, it is important to be sensitive towards these issues, and help users to be mindful about them.
- Does the application recognize the user's gender identity beyond binary gender identities? Gender issues are specifically mentioned as an important factor in traumatization by SAMHSA (2023). This ensures that the application does not further harm the user.
- Does the application get updated with the most recent world incidents that might affect users? By being aware of ongoing issues that could lead to re-traumatization, the application could avoid harm more effectively. This criterion does not require news delivery but rather sensitivity to global crises such as wars and natural disasters.
- Does the application include land acknowledgment? Land acknowledgment is specifically crucial in communicating sensitivity towards systematic and ongoing trauma that might affect users who identify as indigenous.

Overall, the twenty-three questions that were suggested above could be used in conjunction with MHCC's (2023) guidelines as criteria that ensure a mobile phone application is trauma-informed based on SAMHSA (2023) principles. While not enforcing a specific

intervention to be used, these criteria help establish applications of principles that promote trauma-informed practice.

Additional Criteria: User Engagement and Consistent Evaluation

User Engagement

Based on studies such as Cernvall et al. (2018), Davis et al. (2024), and Linardon et al. (2019), lack of engagement is one of the factors that negatively affects the benefits of these applications. Based on feedback from users, gamification helps increase user engagement and therefore helps increase the efficacy of these applications (Corthésy-Blondin et al., 2023). The authors suggest that use of task-based games which provide feedback and awards points can specifically be beneficial (Corthésy-Blondin et al.). Therefore, two additional questions to evaluate applications for PTSD could be the following:

- Does the application include gamification? This question aims to ensure that the application attempts to increase engagement.
- Does the application allow the user to track, receive feedback and collect rewards in completing their tasks? By checking these factors, the question aims to address specific elements that have been shown to increase user engagement.

On-going Evaluation

Another factor mentioned in the literature is the necessity of ongoing evaluation of these mental health applications. Specifically, it was noted that applications undergo updates regularly, which might change their effectiveness (Hallenbeck et al., 2022). Therefore, it is important to ensure that every update to the content of the application is followed by an evaluation. As a result, further questions to be asked could be:

- Does the application have ongoing feedback options by which the user can provide their input regarding new updates? By gathering user feedback regularly, the developers can monitor the application's effectiveness and gather data for further research. In line with the trauma-informed principles of SAMHSA (2023), data collection needs the user's consent as well as transparent information about the aims and their use.
- Are the application developers committed to scientific research after meaningful and significant changes to the content? Should the application undergo significant changes, it is important to carry out scientific research to explore their effectiveness.

In order to help the consistency of how mobile applications are evaluated based on their effectiveness to address PTSD, several evaluative criteria were introduced. Mainly, these criteria are based on SAMHSA's (2023) principles of trauma-informed care, as well as two other factors that research showed to be important. It is suggested that best practice would be for these applications to promote and show "safety, trustworthiness and transparency, peer support, collaboration and mutuality, empowerment, cultural, historical, and gender issues" (SAMHSA, p.10), techniques to increase user engagement, and ongoing evaluation. These criteria ensure that the applications meet what has been found to be helpful to address trauma and avoid issues that do the opposite. These criteria could be potentially added to MHCC's (2023) already existing evaluation guidelines that ensure an application is in line with values important in mental health. While MHCC's criteria are based on research, they are not specifically for applications that aim to address PTSD. Therefore, these questions could be "additional criteria for applications that address trauma".

Implications for Counselling Practice

Considering the findings discussed in this capstone, counsellors can make use of mobile applications in various stages of providing therapeutic care, such as prior to the first session, in between sessions, or for maintenance after sessions have been concluded. However, since studies found limitations in using these applications (Shakespeare-Finch et al., 2020), it is important that counsellors evaluate their clients' level of comfort with using technology and weigh the risks against its potential benefits. For example, should a client find these applications more distressing than helpful (see examples in Shakespeare-Finch et al.), it may be best to avoid using them. Additionally, research shows that different applications use different theoretical foundations in order to help address symptoms of trauma. For example, while some applications use EMDR, such as the Healing Trauma App Series (Grant et al., 2025), others use ACT (Zhao et al., 2023) or exposure therapy (Davis et al., 2024). Counsellors, therefore, can explore and choose applications that are in line with their theoretical approach and with what the client finds to be beneficial. It might be useful for counsellors to use the list of evaluative questions suggested by this capstone to select an application that is trauma-informed and therefore better suited to help with the symptoms of PTSD.

Lastly, counsellors need to be mindful of the fact that mobile phone applications do not replace the therapeutic relationship and the human connection between the therapist and the user (Cuijpers et al., 2019). Therefore, while the available research on these applications is still at a preliminary stage, it is important not to position them as a replacement for therapy and over-rely on them as stand-alone tools. In other words, counsellors might best avoid "referral" to these applications but use them as a tool.

Implications for Policy Makers

Beyond individual practice described above, this capstone could also have implications at the higher policy level. Specifically, using the questions suggested in this capstone could help develop lists of recommended PTSD-focused applications that meet minimum standards for safety, evidence, cultural responsiveness, and data protection. Adhering to trauma-informed principles by following the suggested criteria would also support more transparent communication with users. Requiring developers to clearly state the theoretical model behind an application, the nature and quality of the evidence supporting it, and data management (e.g. data security, storage, and access) would show trustworthiness and transparency. This could help address some of the mistrust trauma survivors already experience toward healthcare systems and digital platforms.

Limitations of This Capstone Project

This capstone focused on the diagnosis of PTSD as provided by the DSM-5-TR (APA, 2022), with minimal attention to other types of trauma-related disorders. The DSM-5-TR states that differential diagnosis of PTSD could include adjustment disorder, acute stress disorder, anxiety disorders, major depressive disorder, attention-deficit/hyperactivity disorder, personality disorders and dissociative disorders amongst several others (APA, 2022). Therefore, it is important to note that the findings of this explorative project may not apply to all individuals who have symptoms that appear to be similar to the symptoms of PTSD. In addition, it is important to acknowledge that mobile applications, by nature, constantly change and undergo updates and get equipped with newer technologies. Therefore, the conclusions and implications discussed in this capstone might be limited to this specific period of time and be less applicable in the future.

Reflections on Personal Learning

In writing this capstone project, I have learned valuable lessons about providing treatment for PTSD, especially when barriers are high in accessing evidence-based treatment. My goal in choosing this subject was to help expand our understanding of trauma treatment beyond the conventional therapies because they can be very difficult to access for many populations. I believe that when counsellors want to promote social justice, this also needs to go beyond the therapy room for it to be meaningful. Even though use of mobile phone applications may not entirely close the gap that exists in providing treatment, it might be a starting place to connect users with healthcare professionals in a more effective and timely manner. For example, if a user is exposed to psychoeducation and validation through these applications, they might be more accepting and willing to seek treatment.

What I have learned is that even though mobile phones and technology are widely used, they still need to undergo research and evaluation to be used effectively for mental health, specifically for PTSD. Even though the content of these applications may be based on evidence-based treatments, their results are not guaranteed. Applications are different in that they do not provide a therapeutic relationship, and they require a person to have technology literacy, a willingness to be independently using tools, and trust in these technologies. Therefore, simply having an application available for PTSD does not make it a tool that can be used.

Summary and Conclusion

In summary, this capstone project explored a specific way to address the gaps that exist between experiencing PTSD and receiving appropriate treatment. Use of technology, in particular mobile phone applications, could provide a new path to connect individuals who experience symptoms of PTSD with psychoeducation and evidence-based interventions

(Linardon et al., 2019; Owen et al., 2018). The available literature shows moderate benefits in using these applications, specifically in alleviating symptoms and helping the individuals' perception of how beneficial treatment can be (Owen et al.; Possemato et al., 2016). The studies, however, showed inconsistent findings, using various methodology and measurement tools (Linardon et al.; Owen et al.). Therefore, it is difficult to draw definite conclusions as to the extent and the specific way these applications might be useful or how they could be improved.

Based on these inconsistencies, this project draws on the trauma-informed principles outlined by SAMHSA (2023) along with other key factors identified in the literature to propose criteria that may help increase the consistency of what users can expect from these applications. These criteria can then form the basis of how they are evaluated and therefore make them easier to study. While these questions do not limit the theoretical foundation of the application, they promote factors such as safety, trustworthiness, empowerment, collaboration, and user engagement which are best practices in working with trauma (SAMHSA). For example, an application can be based on Prolonged Exposure Therapy or on Trauma Focused-CBT and still adhere to the same principles and evaluative factors mentioned in this chapter.

This capstone was presented with the hope to shed light on the available literature and the current landscape on use of mobile phone applications that aim to address PTSD. It appears that providing mental health supports through smart devices is a phenomenon that shows promise but needs to undergo more scientific research and evaluation in controlled settings.

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