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A MOBILE APPLICATION FOR MENTAL HEALTH PROFESSIONALS TO SUPPORT THEIR WELL-BEING, BASED ON POLYVAGAL THEORY

SELEN ATAÇ
119507047

Prof. Dr. Ahmet Tamer AKER

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A Mobile Application for Mental Health Professionals to Support Their Well-Being, based on Polyvagal Theory

Polivagal Teoriye Dayalı, Ruh Sağlık Çalışanlarının İyilik Hallerini Destekleyecek Mobil Uygulama

Selen Ataç
119507047

Tez Danışmanı Prof. Dr. A. Tamer AKER (İMZA) .....
İstanbul Bilgi Üniversitesi

Jüri Üyesi: Dr. Öğr. Üye. Ersin UYGUN (İMZA) .....
İstanbul Bilgi Üniversitesi

Jüri Üyesi: Dr. Öğr. Üye. Alişan Burak YAŞAR (İMZA) .....
İstanbul Gelişim Üniversitesi

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FOREWORD

Do not stand
By my grave, and weep.
I am not there,
I do not sleep—
I am a thousand winds that blow
I am the diamond glints in snow
I am the sunlight on ripened grain,
I am the gentle, autumn rain.
As you awake with morning's hush,
I am the swift, up-flinging rush
Of quiet birds in circling flight,
I am the day transcending night.
Do not stand
By my grave, and cry—
I am not there,
I did not die.
By Mary Elizabeth Frye.

Till we reunite again, I dedicate this journey to you; my dearest friend Güçlü.

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ABBREVIATIONS

ANS	Autonomic Nervous System
MHP	Mental Health Professionals
mPFC	Medial Prefrontal Cortex
STS	Secondary Traumatic Stress

IMAGE LIST

ABSTRACT

Mental health professionals bear the burden of immense stress in their practice. Professionals working in this field experience increased levels of burnout, secondary traumatic stress, depression, compassion fatigue, and anxiety, especially due to the workload of the 2020 Covid-19 Pandemic. For professionals to cope with stress and gain psychological resilience, they need self-care, self-awareness, and support in their field. Mental healthcare professionals need to make sense of their responses and become aware of their reactions to people and events.

The use of mobile applications and digital platforms has increased during the pandemic period. Polyvagal Theory, an intervention introduced by Dr. Stephen Porges, can be used to support the symptoms of mental healthcare professionals. This thesis aims to develop a mobile application for mental health professionals to monitor their self-care and make sense of their autonomic nervous system responses using Polyvagal Theory. This method of mobile support allows mental health professionals to engage at their own pace and need.

In this study; 10 mental health professionals were surveyed and their responses were assessed for face validity. There is no other similar mobile application in Turkey that uses the Polyvagal Theory and has been developed for the benefit of mental health professionals, and this is the first study to do so.

Keywords: Polyvagal Theory, Mobile Applications, Burnout, Secondary Traumatic Stress, Mental Health Professionals.

ÖZET

Ruh Sağlığı Uzmanları; çalışma alanlarında öz bakım, öz farkındalık ve desteğe yoğun ihtiyaç duymaktadırlar. 2020 Covid-19 Pandemisi ile beraber, özellikle sağlık çalışanları ve ruh sağlığı çalışanlarında oluşan iş yükünden ötürü, bu alanda çalışan kişiler tükenmişlik, ikincil travmatik stres, depresyon belirtileri, merhamet yorgunluğu ve yoğun kaygı gösterebilmektedir. İnsanın stresle başa çıkması ve psikolojik sağlamlık kazanması için olaylara, kişilere verdiği tepkileri anlamlandırması, takip etmesi, bunun farkındalığına varması gerekmektedir.

Mobil uygulamalar ve dijital platformların önemi, yaygınlığı ve kullanımı özellikle Pandemi dönemi ile artmıştır. Bu tezin amacı; yeni müdahalelerin değiştirebilme gücünden yola çıkarak ruh sağlığı çalışanları için öz bakımlarını takip edebilecekleri, tükenmişlik sendromu ve yoğun kaygı belirtilerine neden olan sinir sistemi tepkilerini anlamlandırabilecekleri ve bu süreçlerine destek olacak bir mobil uygulama prototpi geliştirmektir. Böylece birebir görüşmenin zor olduğu kişilere ve daha da geniş bir kitleye ulaşabilmek hedeflenmiştir.

Önerilen bu çalışma prototipinin altyapısı için destekleyen kuramlarda Polivagal Teori'den yararlanılmıştır. Bu çalışma; alanında yetkin olan 10 ruh sağlığı uzmanına danışılmış ve yüz geçerliliğine bakılmış ve önerilen revizyonlar bulgular kısmında sıralanmıştır. Yapılan literatür ve alan araştırması çerçevesinde Türkiye'de Polivagal Teori kuramının kullanıldığı ve ruh sağlığı çalışanları yararına geliştirilmiş başka bir uygulamaya rastlanmamıştır.

Anahtar Kelimeler: Polivagal Teori, Mobil Uygulama, Tükenmişlik, İkincil Travmatik Stres, Ruh Sağlığı Çalışanları.

CHAPTER 1
INTRODUCTION

In their line of work, mental health professionals (MHP) are exposed to a great deal of stress. Burnout, secondary traumatic stress, depression, compassion fatigue, and anxiety are common among professionals in this field, particularly given the workload of the 2020 Covid-19 Pandemic. MHP are going through an overwhelming workload and physical exhaustion, and exposure to multiple forms of disaster. MHP report high levels of stress, insomnia, anxiety, depression, and burnout. Depending on the level of risk they are exposed to, there is also a risk to develop secondary traumatic stress. Professionals require self-care, self-awareness, and support in their field to cope with stress and build psychological resilience. Well-being is fundamental to our survival and involves all aspects of our lives: physical, mental, emotional, social, and spiritual. Happiness and fulfillment are associated with well-being, though what those words mean to each of us is, of course, subjective. Self-improvement, resilience, mindfulness, and well-being have been linked in research.

In this thesis, a mobile application is proposed to help professionals to track and support their mental health, well-being, and self-care. The mobile application prototype will be based on Stephen Porges' Polyvagal Theory with examples from Deb Dana's clinical polyvagal exercises (Dana, 2018). There is no other similar study that supports the well-being of MHP and is also based on Polyvagal Theory. Mobile applications and online platforms have been a necessity, especially during the 2020 worldwide pandemic. This study aims to provide a support that can reach a wider audience. Evidence-based mobile applications on mental health are few on the market. The results of the prototype indicate this unique application, has a multi-modal support system and has accessibility to professionals, and can expand to wider audiences.

1.1. COMMON CHALLENGES FOR MENTAL HEALTH PROFESSIONALS

Compassion and empathy are key qualities in the art of human service; these traits help mental healthcare professionals to gain insight into their clients' worlds and serve as an instrument for their needs (Figley, 2002). The high work demands, such as long hours, short staff, and inadequate resources, make mental health work a stressful career. Other issues they face include a demanding atmosphere in mental health services, poorly defined roles, a shortage of spare time, and patient violence. According to a qualitative study of mental health professionals, the listed top five sources of distress include administrative demands, work overload, responsibility for patients and relapsing patients, and lack of resources (Kumar S., 2007). In therapeutic work, they must employ their skill sets as instruments; keeping their emotions distinct from their profession, while dealing with a wide spectrum of overwhelming emotions. They need to balance their personal and professional lives. They also may experience a 'hero complex'; the need to rescue the patient or a sense of failure if the patient's progress is not going well. Thus; all of these factors might evoke feelings of powerlessness - or feelings of inadequacy (Kumar S., 2007).

Mental health professionals are exposed to high levels of stress and trauma in the course of work; these exposures have been found to influence their general psychosocial and physical health, as well as their overall well-being (Sabo, 2011). The aftermath of challenges in their line of work might surface as compassion fatigue, professional burnout, or secondary traumatic stress.

1.1.1. Compassion Fatigue, Burnout, and Secondary Traumatic Stress

Mental health professionals (MHP) who experience prolonged exposure to suffering may experience emotional exhaustion and a reduction in their ability to

express compassion and bear the suffering of others (Figley, 2012). This is called compassion fatigue, which is a syndrome that affects healthcare personnel

and is related to psychological distress, emotional exhaustion, decreased interpersonal functioning, and physiological issues (Sabo, 2011). Admitting feelings of exhaustion may be more challenging for MHP since they have a moral and legal obligation to their clients and uphold high standards of professional competence. This is because they may be blind to their symptoms or fear appearing incompetent to their peers. (Negash, & Sahin 2011).

Burnout is a state of fatigue caused by long-term, high-stress work environments. Psychoanalyst Herbert J. Freudenberger, coined the term "burnout" as emotional exhaustion, feeling unable to contribute to others, somatic symptoms, depersonalization, and feelings of inadequacy are the most generally used definitions for the syndrome today. Burnout is more common in professions that need close interpersonal relationships. Burnout is common in the healthcare profession, as workers are expected to be humane, strong, and compassionate, as well as "saving lives" (Hoşgör, et al., 2021). Psychotherapists in private practice reported less burnout than those in the public sector, while Vredenburgh et al. (1999) found similar results for psychiatrists in hospitals versus those in private practice. (Galek, et al., 2011). The harsh environment and long hours may cause one to experience cynical attitudes and impersonal feelings towards their clients, treating them as objects. Even though burnout and compassion fatigue are two separate phenomena, burnout is one of the aspects of compassion fatigue, and the two are thus mutually reinforcing notions. Burnout, on the other hand, often has a slow beginning, whereas compassion fatigue has a sudden onset of unpleasant symptoms (Patel R., 2018). Burnout has been related to decreased productivity and lower patient care quality, according to research.

For mental health professionals, mindfulness-based therapies are useful in reducing burnout (Askey-Jones R. 2018). Mindfulness and group skills are beneficial and protective characteristics in the fight against burnout. Several authors emphasize the relevance of employee engagement, wellness, and resiliency in combating burnout, as well as the importance of employers instilling these abilities

in their workers (Henne, 2020). Academic work has also been linked to depersonalization, emotional fatigue, and overall stress, suggesting that people with academic pursuits may have personality qualities that protect them from burnout. While adding teaching to clinical responsibilities may increase the burden, it may also reduce work-related stress and promote a sense of professional success (Kumar, 2007).

Secondary traumatic stress (STS) is a natural reaction that many psychotherapists who work with trauma survivors experience, seen as an ‘occupational hazard’ in direct patient care of traumatized people. STS is a subjective reaction of the mental (and health care) in response to trauma exposure. STS is believed to be a quick onset acute reaction with symptoms that are nearly identical to those of clients suffering from posttraumatic stress disorder (Sodeke-Gregson, 2013). Whereas compassion fatigue and burnout can occur even when providers are not working directly with traumatized patients.

1.2. THE NEUROBIOLOGY OF FEELING SAFE; POLYVAGAL THEORY

Dr. Stephen Porges proposed the polyvagal theory in 1994, based on a neuropsychological evolutionary view of the vagus nerve's role in emotion regulation, social interaction, and fear response. Since then, the idea has ushered in a new understanding of trauma and recovery, providing a physiological explanation for trauma survivors' experiences for the first time. Founded and originated by Dr. Porges, Polyvagal Theory tracks our evolutionary history to becoming a social mammal (Porges, 1995). We were all familiar with the two defense mechanisms triggered by two parts of the nervous system before polyvagal theory: sympathetic fight-or-flight and parasympathetic shutdown, also known as freeze-or-faint (Porges, 2017). Dr. Porges refers to the social engagement system as a third form of nervous system response identified by the polyvagal theory, which is a playful combination of activation and calming that operates through unique nerve

influence. On the other side, using our social engagement system necessitates a sense of security (Porges, 2017).

Dr. Stephen Porges was a clarinet player before he was an academician. This skill made him aware of his physiological states and how he uses his breath. This knowledge has been the base of his Polyvagal Theory, extended exhale of breath activates the ventral vagal system, a system of feeling safe and secure. By defining an evolutionary hierarchy in the functioning of the autonomic nervous system to difficulties, the Polyvagal Theory offers a map of the status of the autonomic nervous system throughout every challenge. Knowing a person's autonomic state provides us with information about their emergent behavioral, emotional, and physiological reactions to threats or good events. (Porges S. W., 2020).

Think of a dog park, for example, you will notice that some dogs are terrified. They behave in a fight-or-flight manner. The other ones will express an interest in playing. When a dog delivers this signal, it indicates a high level of excitement. This lighthearted energy, on the other hand, is considerably different from the intensity of fight-or-flight reactions. The social engagement system is defined by its lively nature. We function from our social engagement system when we see our environment as safe. We can traverse relationships with the help of the social engagement system.

Polyvagal Theory, also known as the "science of safety," assists therapists in understanding the role of the autonomic nervous system in trauma therapy. Because trauma is stored in the body, particularly the neurological system, you must first create a safe environment in which your clients may begin to self-regulate, open up, and get to the root of their challenges. Supporting MHP and their clients in utilizing their social engagement system allows them to become more adaptable in their coping techniques.

Deb Dana is the coordinator of the Traumatic Stress Research Consortium at the Kinsey Institute. She is a clinical social worker, and therapist who saw the need for a practical application of polyvagal theory and adapted it for clinical and therapeutic use. In the manifestation of this goal; Dana is the author of three books: The Polyvagal Theory in Therapy (Dana, 2018b), Clinical Applications of the Polyvagal Theory, and Polyvagal Exercises for Safety and Connection, the latter released in 2020. Dana breaks down the theory's three main concepts for organizing the nervous system: hierarchy, neuroception, and co-regulation. Dan states "The biological imperative to be connected with others to survive; “We're hoping to meet more regulated and welcoming people." (Dana, 2015). Even when we are self-regulating, the want to be safely connected to other people lingers throughout our lives.

Dana explains the polyvagal theory as an important tool for both therapists and clients by stating that the theory made a lot of sense to her when discussing the inner workings of our brain and nervous system because it is the vehicle through which we go through life (Dana, 2015). Dana encourages her clients to learn about their neurological systems so that they can deal with the more mundane aspects of life. Because the nervous system informs the brain, it is critical to first understand the nervous system's functions before moving on to the brain. Dana believes that this is the essential breakthrough presented by the polyvagal theory.

1.2.1. Autonomic Nervous System According to Polyvagal Theory

Within our bodies, we have an awesome survival mechanism that resides in our primitive brain. This is our autonomic nervous system. It is responsible for our body's organs' involuntary functions. It allows our hearts to beat, our lungs to breathe, and our digestion to move. The autonomic nervous system is what keeps us alive. There are two branches of the autonomic nervous system. The sympathetic nervous system, also known as our fight-or-flight system, and the parasympathetic nervous system, generally known as our rest-and-digest system.

Depending on where the nerve fibers are located in the body, these two systems act antagonistically, synergistically, or independently. We usually concentrate on our fight-or-flight response mechanism. This is how we react when we are in danger or under threat. When an alarm or stimulus occurs, our bodies mobilize and become activated to fight or flee the threat. This implies that our heart rate quickens, our breathing quickens, our pupils dilate, and new oxygen is pumped into our skeletal muscles so we can fight or flee. When the threat is no longer present, our parasympathetic nervous system takes over to slow down the sympathetic fight-or-flight response, which means our heart rate and breathing rate return to normal, digestion resumes, and we feel more regulated and calmer (Porges, 2017). When a person is in a freeze state, two defense systems are activated. The person could be in both the mobilization and immobilization, just trying to stay alive. Because the neurological system is overloaded with threat and danger signs, the only way to pull them out of that state is through indications of safety. Reduced stimulation, as well as a change of surroundings, quieting the environment, relaxing music, and a gentle voice, may be beneficial in this situation.

1.2.2. Neuroception; Our Nervous System is Always Listening

When it comes to bodily responses vs. cognitive evaluations, different environmental aspects are connected with various levels of safety. The "wisdom" in our body and the mechanisms of our nervous system that function outside of our consciousness is our ability to assess safety from an adapted survival perspective. To look at it another way, our visceral reactions to people and places are influenced by our cognitive assessments of environmental risks, which includes recognizing potentially dangerous interactions. Neuroception is the neurological process that analyzes risk in the environment without being aware of it, according to Polyvagal Theory (Porges, 2003, 2004).

The nervous system constantly assesses risk by processing information from the environment through the senses. Neuroception is a word coined by Dr. Stephen Porges to describe how neural circuits determine whether events or persons are safe, hazardous, or life-threatening (Porges, 2017). Neuroception occurs in primitive portions of the brain without our conscious awareness. When a person is identified as safe or hazardous, neurobiologically established prosocial or defensive actions are triggered. Even if we are not conscious of danger on a cognitive level, our bodies have already begun a series of brain processes that will promote adaptive defense actions such as fight, flight, or freeze on a neurophysiological level. Neuroception may be also seen as a physiological aspect of our intuition; a physiological response when it detects features of risk. However, one may not be aware of the features of the environment that triggers neuroception. These physiological feelings may influence our narrative of that experience. When a person is either on a mobilization defense or experiencing a shutdown, they tend to develop stories/narratives to make sense of their body response. (Porges, 2011)

1.2.3. Polyvagal Theory and the Treatment of Trauma

The amygdala is designed to detect and react to potentially dangerous people, places, and things in the environment. This is critical for survival and safety. A trauma victim may closely monitor their surroundings to ensure their safety after a traumatic event because the amygdala can become even more sensitive to potential threats in the environment. They may also experience strong emotional reactions to people, places, or things that might be threatening to them or remind them of the trauma (McLaughlin, 2014). It may be challenging to pay attention, visit new places, or engage with unfamiliar people as a result of this increased sensitivity to environmental threats. The medial prefrontal cortex (mPFC) is involved in learning that once-dangerous people or situations are now safe and assists in regulating the activity of the amygdala. In individuals who have had trauma, the mPFC and amygdala connections may not always be as robust (McLaughlin, 2014). This can lead to persistent elevations in fear and anxiety about

cues that remind people of the trauma they experienced. The hippocampus plays a role in memory and learning. People who have undergone trauma have been found to suffer learning and memory impairments. This implies that trauma may have an impact on the hippocampus' growth. Learning and memory in general, including the capacity to absorb and retain information about one's environment, are likely to be impacted by trauma (McLaughlin, 2014).

The states of the autonomic nervous system can be seen as a traffic light where the three stages of the lights can represent the safe state (green) mobilization (yellow), and immobilization state (red). When the person feels safe, it is like the green light. The vagus nerve is working well; the person is calm, centered, grounded, and balanced. The person's social engagement system is active and the body releases oxytocin. The yellow light is when the system is in a fight or flight state. The person feels tension, and heat on the shoulders and arms. It is hard to relax, but the social engagement system changes. Breathing and the voice of the person change to a rapid or alert state. The body releases adrenaline and cortisol. This is the mobilization state. If the person cannot deal with the yellow light, the body moves to immobilization from mobilization. This is the freeze state, the red light. The person feels stuck, and numb, lose the ability to communicate and it is hard for the person to hear others. Isolation can be seen in this state too.

People who have gone through trauma might not be able to comprehend knowledge on how to tell safe situations from dangerous ones, which could cause them to mistakenly view seemingly harmless situations as frightening. A traumatized individual, for instance, can find it challenging to discern between risky and safe activities (such as strolling down a dark alley) (e.g., walking around a dark corner at home). It's important to note that these brain changes are not long-lasting. The remarkable plasticity of the brain allows it to adapt to social and environmental cues (McLaughlin, 2014).

1.2.4. The impact of Covid 19 on Mental Health Professionals and its relation with Polyvagal Theory.

Figley defined STS as “the stress deriving from helping others who are suffering or who have been traumatized” (Orrù, et al. 2021). Covid-19 pandemic challenged everyone’s perception of the world and how we interact with each other. The population's mental and physical health has gone through a massive challenge and beside our physical well-being, our mental health was deeply compromised too. The mental well-being of health professionals working on the front line showed increasing (medium to high) levels of anxiety, depression, nervousness and insomnia, and burnout. A considerable proportion of Healthcare Workers (HCW) reported symptoms of STS (41.3%), emotional exhaustion (56.0%), and depersonalization due to the increased exposure to death and depression (48.9%) (Orrù, et al. 2021). Therefore, pathologic secondary traumatic stress (STS) can be considered another consequence of the Covid-19 outbreak for MHP facing physical pain, psychological suffering, and death.

The Polyvagal Theory is a neurobiological model that explains how a crisis triggers threat-related reactions, disturbs our ability to manage our behavioral and emotional states, stifles our optimism, and compromises our ability to trust and feel comfortable with others (Porges, 2017). A perceived threat shifts our autonomic nervous system (ANS) into a state of defense, which disrupts the neurophysiological states required to co-regulate with others and maximize homeostatic processes that lead to health, growth, and restoration. A Polyvagal perspective clarifies how our nervous system is impacted by our imagined sensitivity to the Covid-19 virus and the necessary social distancing and self-quarantining procedures (Porges, 2020).

As a result, the Covid-19 pandemic challenges our neurological system by simultaneously challenging contradictory emotional and physical needs with the avoidance of touch and social interaction. Devoid of the fulfillment that is

imperative to connect with others to feel calm and safe. There is no simple solution to this conundrum. Modern technologies, on the other hand, present us with tools that we may learn to use in a more “mindful” manner (Porges, 2020).

CHAPTER 2
LITERATURE REVIEW

2.1. POLYVAGAL INTERVENTION FOR MENTAL HEALTH PROFESSIONALS

In the light of Peter Levine's "Healing Trauma" book, trauma-healing modalities that are commonly used are; The Somatic Experiencing®, a method by Levine, that has a body-oriented approach to the healing of trauma and other stress disorders. Compassionate Inquiry® is an approach developed by Dr. Gabor Maté, that release and unveils the body states, level of consciousness, and assumptions that form the real message that words both express and conceal. And others are Cognitive Behavioral Therapy (CBT), Emotional Freedom Technique (EFT), Eye Movement Desensitization and Reprocessing (EMDR), NeuroAffective Relational Model (NARM), and Polyvagal Theory.

Ancient practices have focused on strategies that integrate the body and mind for millennia. The vagal nerve is now being pinpointed by Western research as the precise neurological mechanism. The vagus nerve functions as a "bridge" that connects our neurophysiological systems to our brains and emotions in both ways. It is the tenth cranial nerve that transmits the most bidirectional information between the brain and the body of any other nerve. In the social engagement system, motor fibers of five cranial nerves (ie, particular visceral efferent pathways) that originate in the brainstem regulate the muscles of the face and head, as well as the heart. By enhancing the vagal impact on the heart through a branch of the vagus originating in the nucleus ambiguous, this system promotes emotional communication through facial expressions and prosodic vocalizations, improves listening to voices, and soothes the physiological and behavioral state (Lucas, et al., 2018).

The vagus nerve runs from our brain to our stomach. It starts in the brain's center and travels all the way to the gut. It influences facial expressions, voice tone, heart rate and heart rate variability, respiration, and the function of the spleen, liver, kidneys, and intestines as it travels through the body. It can aid in the reduction of inflammation as well as the improvement of your immunological response. It is the body's primary caretaker nerve. With that information, we can describe trauma patients with anxiety, pain, or compulsive thought patterns as being stuck in the body. Because the body is unable to shed trauma, it lingers, resulting in a "traumatized" personality. A Polyvagal-informed therapist would pay close attention to your own social cues in that state, such as body language, facial expressions, vocal inflections, eye contact, and vocal tone (Lucas, et al., 2018). An attuned presence of a therapist in a clinical setting, impact one's mind and body. Traumatized clients may present with a flat affect and a flat vocal tone, both of which are indicators of a vagal shutdown.

The ventral vagal complex can be used to characterize the social engagement system in terms of function. In fact, in the absence of safety, reducing threats is the second most basic human need; but, removing threats alone is insufficient to activate the brain circuits that sustain connectivity and health. (Lucas, et al., 2018) A Polyvagal approach meets a person's need to feel safe, not just on a cognitive level but also physiologically and emotionally. The facial expressions, tone of voice, and eye contact of a therapist create the needed safe environment for the client. By guiding clients to notice and understand their autonomic states, therapists can help them to identify and track their states.

The nervous system moves toward regulation by using polyvagal-informed somatic therapy. The goal is to help the client connect comfortably with self, activate the Ventral Vagal Complex, and feel empowered to work with, rather than against. Vagus nerve relaxation exercises that are customized for one's state; such as meditation, breathwork, daily walking exercises, socializing, singing or chanting and exposure to cold are a powerful component of Polyvagal-informed therapy. The

application of the polyvagal theory provides essential insight into the development of burnout as a result of strain-producing stress, as well as prevention and treatment options (Henne, 2020). Acupuncture, yoga, mindfulness, massage, and vagus nerve stimulation are also some of the interventions that increase vagal tone (Martins, et al. 2021).

Another form of therapy for mental and emotional health is music. Three elements—the therapist, the client, and the music—interact dynamically in music therapy. It involves more than just singing, playing an instrument, or listening to music. In the pages that follow, the polyvagal theory is used to provide a plausible explanation for how and why music therapy might support physical function and health during impaired states brought on by mental and physical sickness, including the impacts of trauma. (Porges, 2011) Attempts to socially engage a traumatized person may result in defensive mechanisms of rage and anger rather than relaxation. A long-forgotten brain circuit that severely inhibits social engagement behaviors and may distort neuroception, resulting in misleading danger sensing, is activated in life-threatening situations. As a result, trauma treatment requires a novel paradigm distinct from conventional psychological techniques of face-to-face connection in order to create the calm states associated with the social engagement system. By avoiding the early face-to-face interactions that a traumatized person can misinterpret as a threat, music, and music therapy activities might act as an alternate doorway to the social engagement system. Without the necessity for an initial face-to-face encounter, music therapy offers a novel technique to re-engage the social engagement system. (Porges, 2011).

2.1.1. Befriending the Autonomic Nervous System

The autonomic nervous system (ANS) is designed to assist you in overcoming the challenges of daily life. Because the autonomic nervous system learns from experience, fresh and ongoing experiences can remodel the system, which is good news for all of us. It is possible to generate new patterns. Autonomic

resilience can develop as you learn about your vulnerabilities and strengths. We may begin to befriend the autonomic nervous system and record our response patterns after we have a basic comprehension of its job and responses in the service of our safety and survival.

According to Dana; we can translate this knowledge into our everyday lives by seeing the ANS as a ladder. At the top of the ladder is one's ventral vagal state which is the feeling of safety and connection. Our social engagement system is active and we are connected to our environment and relationships. The daily life experiences include being organized, self-care, socialization, and feeling regulated and happy. In this state the heart rate is healthy, blood pressure is regulated and the immune system is functioning well with good digestion, the quality of sleep is good. These all indicate a good sense of well-being. (Dana, 2018)

Moving down the ANS ladder, if one is feeling tense, under threat, or danger is triggering the neuroception, one moves to the sympathetic branch of the ANS. The heart rate speeds up, breath is short and the person is agitated, ready to fight and flight. One can perceive the world as a dangerous place. Anxiety and anger can arise within. Inability to focus, sleep problems, weight gain or loss, high blood pressure, back body tension, and stomach problems can be seen (Dana, 2018).

The ANS's oldest response is the bottom of the ladder. The dorsal vagal pathway is the shutdown state, the primitive vagus moves one into a dissociation, collapse, or shutdown. The world feels empty, dark, abandoned, and alone. Problems with memory, depression, lack of energy, self-isolating, chronic fatigue, and low blood pressure.

Attending these practices on the ladder is a result of the befriending skills. Our mapping automatically leads to track. We can begin to consciously adjust and tone our autonomic nervous system once we are aware of tracking. We will also be able to navigate our desire for safety and connection successfully. When the three

sections of our autonomic nervous system operate together, our well-being is good. We can better understand this integration if we consider these states as a home, a whole, instead of a ladder (Dana, 2018). The dorsal vagal is responsible for the "basic utilities", the system always working in the background keeping our body in order. The sympathetic state is our security guard protecting our home, our being, from dangers and emergencies. It is our alarm system to warn us and help us to get into action. The ventral vagal system is where we enjoy our home, and see it as a place to rest and rejuvenate. The basics for the house are running, it is secure and all this integration leads us to feel connected to the world and community we live in.

2.1.2. Mapping the Autonomic Nervous System

We can begin to get to know and befriend the autonomic nervous system and record our personal response patterns after we have a basic understanding of its role and responses in ensuring our safety and survival. Attending practices is a result of the befriending skills. Our getting around, and mapping inevitably leads to track. We can begin to consciously adjust and tone our autonomic nervous system once we are aware of tracking. We will be able to navigate our desire for safety and connection successfully (Dana, 2018).

We use maps to get back home or when we lost. Mapping our ANS helps to understand our needs, responses, beliefs, emotions, and behaviors. It creates an autonomic awareness. According to Dana, a mapping consists of three maps; Personal Profile Map, Glimmers and Glows, and The Regulating Resources (Dana, 2018). Personal Profile Map shows where the person is on the autonomic ladder. It sets a foundation to recognize and identify one's state. With Personal Profile Map, mental health professionals can guide their clients and themselves toward a more present autonomic state which would lead them to a state where somatic thinking, feeling, and getting into action occurs.

The second mapping is Glimmer and Glows (words coined by Dana, 2018). The map asks the question; “What brought me here/to this state?”. Glimmers are the sparks of sympathetic and dorsal states, whereas Glows are the result of ventral. The opposite of a trigger is glimmering. A glimmer provides us a sigh of relief, helping us to feel safe and comfortable, whilst triggers tighten our stomach, make it difficult to breathe, and generally warn danger (even when no threat is there). Glimmers are the simplest and little things that spark joy, connectedness, and warmth in us like; a hike in nature, watching the sunset, fresh flowers, chatting with a friend, petting an animal, a nice smell, and soothing music. Glimmers help our system to diminish the prejudice of constant negative threats around us. When we start recognizing these little moments and start noticing and embracing them, they turn into deeper experiences that glows (Dana, 2018).

The last map is The Regulating Resources. It helps to move one out of the dorsal or sympathetic state of the ladder and helps to maintain the ventral vagal state. The map consists of two sections; the first is the things one can self-regulate on his/her own and the second is co-regulation with others. Both steps include inquiry on “what helps me stay in this state for ventral and what brings me out of this state for dorsal and sympathetic.

2.1.3. Guiding the Autonomic Nervous System

'The autonomic nervous system is a common denominator in the human family. We all share the same biobehavioral platform.' Deb Dana.

The gateway to compassion opens when you have a Polyvagal approach to life. An autonomic nervous system that can easily co-regulate and self-regulate opens up the option of moving away from the need for protection and toward a system that thrives on the connection. A damaged ability of autonomous awareness affects our human 'self'. Autonomous awareness teaches one to listen to the stories embodied (Dana, 2018). Guiding the ANS; based on the three maps in the basic

mapping series, this part helps one deepen the "art" of autonomous awareness through a variety of artworks, music, movement, and writing.

2.1.4. Shaping the Autonomic Nervous System

The autonomic nervous system learns through experience. It plays a central role in regulating energy and information (Rejeski & Gauvin, 2013) A person's ability to respond to and recover from the daily challenges of living is an indication of well-being and depends on the actions of the autonomic nervous system. The BASIC framework is a series of exercises that are devised by Deb Dana. The letters BASIC stand for Befriend, Attend, Shape, Integrate, Connect. The exercises help in the creation of autonomic control skills, resulting in enhanced response flexibility and resilience. Bringing explicit awareness to implicit experiences, disrupting automatic reaction patterns, and engaging the ventral vagal safety circuit are all necessary steps in rewiring the neural system.

There is typically a disconnect between physiological state, psychological story, and behavioral reaction when the autonomic nervous system has been altered by trauma. Dangerous signals appear to be everywhere, and even the tiniest memory of a traumatic event triggers a survival response. In the ventral vagal state, the ability to locate regulation is impaired. One will be unable to become quiet and calm or engaged and vocal without moving out of connection and into a state of protection as a result of this (Williamson, E. C. Porges, Lamb, & S. W. Porges, 2015). When working with the BASIC exercises, it's critical to help one to develop a ventral vagal–powered attitude of self-compassion. The exercises are designed to bring autonomic patterns into consciousness, and one should keep track of their progress in a notebook or journal (Dana, 2018).

CHAPTER 3
METHODOLOGY

In this section, the study group of the research, the model, the evaluation questions used and related information, how the data were collected, and the way of analysis are given.

In the literature review; the articles published in English in the databases of APA, Google Scholar, and PubMed were scanned between 2010-2022 date criteria to evaluate the effectiveness of smartphone applications used in the support of well-being in adults, burnout symptoms in mental health workers, and the polyvagal theory. The keywords 'polyvagal theory' or 'professional burnout' or 'mental health' and 'smartphone' or 'mobile app' were used in the search. There are few studies in the literature on mobile applications that are based on mindfulness and cognitive behavioral therapy. However, within the framework of the literature research, no mobile application that supports mental health professionals' well-being and also an app that focuses on Polyvagal Theory has been found.

As a result, Safer Journey - Prototype is developed as a proposed mobile application for mental health professionals in this study. The application is aimed to support MHP' well-being. A well-being support app is designed for mental health professionals and aimed to be accessible anytime and anywhere on the go. The application content is developed around psychoeducation on our autonomic responses according to Polyvagal Theory. Research-based studies on psychology and neuroscience are included in short, simple learning modules. Exercises are based on Deb Dana's book Polyvagal Exercises for Safety and Connection: 50 Client-Centered Practices; which helps one to identify and understand how one reacts. It helps to monitor and track one's process to support resilience and be a mindful supporter of others.

The application is designed as a prototype on Figma, a vector graphics editor, and a prototyping tool. It has been shared via e-mail with 10 mental health professionals to be checked for face validity and has been evaluated on Google Forms.

3.1. PARTICIPANTS

Adult individuals over the age of 30 who have experience in psychology and mental health experience were invited to participate in the study. Informed consent forms were completed by 10 professionals who voluntarily participated. The participants were informed that their participation in the study was completely voluntary, no information statement would reveal their identities, they could withdraw from the study at any point, and their answers would only be used for scientific publication. The data was collected online and stored electronically. Mental health professionals who agreed to participate in the study were defined as female (8), and male (2). The average age of the participants was found to be 38 years. Eight of the participants have received psychological or psychiatric support before. The majority of the respondents are graduates of Psychology. All the professionals know Polyvagal Theory.

3.2. DATA COLLECTION TOOLS

A survey, with open-ended questions and a Likert scale, was used to evaluate the application in addition to the sociodemographic data sent to the experts via e-mail. Data was collected via Google Forms.

3.3. SOCIODEMOGRAPHIC DATA SHEET

The Sociodemographic Data Form (Appendix B) was created to determine the characteristics of the individuals participating in the research. In this form,

participants' age, gender, educational status, titles and field of profession, years of practice, confirmation of psychological or psychiatric support, and confirmation of Covıd-19 diagnosis during the pandemic were collected.

3.4. MOBILE APPLICATION SURVEY

In the survey, the experts were asked to evaluate the purpose of the application, whether the developed app is suitable for its purpose, its adequacy, and effectiveness using a 5-point Likert type scale.

CHAPTER 4
THE IMPERATIVE NEED FOR MOBILE APPLICATIONS FOR WELL-BEING SUPPORT

Mental health is defined by the World Health Organization as "a condition of well-being in which an individual recognizes his or her potential, can manage normal life challenges, can work productively and effectively, and can contribute to his or her community." (Abd-Alrazaq, et al., 2019). Mental health workers are in short supply around the world, with demand outstripping supply (Vaidyam, et al., 2019). Due to a scarcity of mental health resources, providing mental health interventions using the one-on-one traditional gold standard approach is difficult. Mental health services do not reach around 55 percent and 85 percent of individuals in industrialized and developing nations, respectively, according to the World Health Organization (Abd-Alrazaq, et al., 2019). The Mental Health Gap Action Program (mhGAP) of the World Health Organization provides evidence-based solutions to address this worldwide epidemic but also recognizes that hurdles such as a lack of available services and money exist. Even before the Covid-19 pandemic, there was rising interest in the potential role of new technology in extending care and closing the gap between the demand for treatment and the ability to deliver it (Torous, et al., 2021).

Statista indicates that (2021), 6.648 billion smartphone users exist in the world now, which implies that 83.72 percent of the world population possesses a smartphone. Since 2016, the number of mobile application downloads has been increasing, topping 200 billion in 2019. Users downloaded 230 billion mobile applications to their phones in the most recent year studied, up more than 63 percent from 140.7 billion app downloads in 2016. data.ai company reports daily time spent on mobile applications grows up to 35% from 2019 to 2022, marking the “most mobile” global economy yet. Covid-19 pandemic's subsequent lockdown and social distancing policies have increased the migration of users away from 'traditional'

media and towards mobile applications. Approximately 10,000 mental health and wellness apps are already available.

Thus; smartphone applications could provide a low-cost, scalable, and accessible method for delivering effective self-management therapies for anxiety and depression symptoms, particularly to nonclinical populations and people who cannot access face-to-face services (Torous, et al., 2018)

4.1. RELATED MOBILE APPLICATIONS AND DIGITAL PLATFORMS ON THE MARKET

Mobile applications that are developed for the benefit of supporting mental health; like mindfulness applications are popular tools for supporting one's well-being, however, studies have to be examined to measure their effectiveness. There are few products and interventions on the market that have a scientific background. It has also been looked at the selective adoption of self-management apps for depression and anxiety.

Over 90% of all depression app downloads were from (Headspace, Youper, and Wysa). In the case of anxiety apps, there are three options (Headspace, Calm, and Youper) Meditopia is a mindfulness app that is originated from Turkey and used globally in different native languages, but there is no scientific background or clinical research on the applications' efficacy.

Oregon Center for Applied Science (ORCAS) is a technology company that targets health innovation and develops scientifically validated behavioral interventions. ORCAS develops mobile self-management interventions designed to improve physical and emotional well-being and is backing up its work through clinical research and trials. Randomized clinical trials are done to provide measured effectiveness of each mobile product's ability to improve clinical, behavioral, and

engagement outcomes. Among its products is Mood-Hacker, a tool for enhancing emotional health. a mobile self-management tool that reduces symptoms of depression and helps users measure, comprehend, and improve their mood. it is based on cognitive behavioral therapy and positive psychology.

The Ministry of Health of Turkey has implemented a mobile application called Health Professionals Mental Support Application (Sağlık Personeli Ruhsal Destek Uygulaması (RUHSAD)) to protect and support the mental health and well-being of the health personnel who are at the forefront in the fight against the coronavirus epidemic in 2020. The application is only for health professionals who can request support and whose demands are met quickly by making an appointment 24/7 and they can do a video conference from the application by specialist physicians.

4.1.1. Efficacies of These Apps

According to a consumer data analysis, the majority of depression and anxiety apps on the market contrast with the relatively limited number of apps that are frequently downloaded and used. The study indicates, only three applications (Headspace, Youper, and Wysa) accounted for over 90% of all depression app downloads. In the case of anxiety applications, three mobile applications (Headspace, Calm, and Youper) accounted for about 90% of downloads and daily active users (Torous, et al., 2021). Despite this, application marketplaces rarely update the latest research or otherwise take advantage of mobile application interventions' particular potential (Torous, et al., 2021). For example, just 1% of marketplace apps support the use of sensors, implying that digital phenotyping to support behavioral treatments via apps is substantially absent from existing commercial solutions. Rather, the evidence bases for widely used applications remain poor, even when examining more static interventions that do not take advantage of modern smartphone functionalities. According to one study, just about

2% of commercially available mental health applications are backed up by original research evidence (Torous, et al., 2021).

4.1.2. Prevalence of Use

Wasil et al., states a majority of mobile application users were found to use well-being and mindfulness applications for depression (63 percent) and anxiety (56 percent) for an average of one month. While the numbers of downloads of applications are high, commercial software developers do not disclose engagement data, therefore evidence of downloads does not always imply active usage (Wasil et al., 2020).

4.2. EXISTING INTERVENTIONS BASED ON POLYVAGAL THEORY

The autonomic nervous system is designed to help you successfully navigate the challenges of daily living. As we understand our physiological states, our day-to-day experiences also shape. (Dana, 2018) Polyvagal Theory focuses on specific neural exercises that can help you improve your physiological state regulation. According to the theory, neural exercises consisting of temporary physiological state disturbances and repairs through social interactions using safety cues will create higher resilience. Below are the interventions that are found based on Polyvagal Theory.

4.2.1. The Safe and Sound Protocol

We instinctively know how to soothe a newborn using infant-directed words, such as lullabies. Because mothers' voices are more melodious and fall into a higher frequency band, they are more relaxing. The voices of fathers tend to be in the lower frequency regions. Dr. Porges developed a program consisting of 5 one-hour functioning brain workouts aimed to quiet the body's autonomic defenses and

generate a sense of safety in the body by extracting these frequencies and generating algorithms. It's frequently utilized with children with autism spectrum disorders, and it's also being used in trauma treatment. It includes an online training available through Integrated Listening Systems and also a forum on Facebook where families can share their experiences.

4.2.2. Televagal

Televagal is a device that uses a wireless glowing ball to display nervous system variables such as traffic lights. It can be used during therapy sessions or in between them. The PhysioCam was created by Dr. Stephen Porges and colleagues to quantify vagus nerve activation, allowing practitioners to apply his Polyvagal Theory to clinical practice.

4.2.3. The Focus System

Suitable for both children and adults. Improve emotional regulation and brain and body organization. It's used in a wide range of fields, including Occupational Therapy, Speech Therapy, Physical Therapy, Autism and ADHD Specialties, and others. A healthcare method that uses multisensory input to improve brain function by integrating the brain and body. It builds a foundation for learning, attention, cognition, and behavior by combining auditory, balance, and movement

4.3. SAFER JOURNEY: A MOBILE APPLICATION BASED ON POLYVAGAL THEORY

This study aims to develop a mobile application that supports MHP well-being. The prototype aims at mental problems that mental health professionals may encounter more. Burnout, compassion fatigue, and secondary traumatic stress can

be the symptoms they may encounter. This mobile intervention builds upon established psychoeducational approaches for the autonomic responses with a polyvagal approach and on planning action steps to address its responses and build safer patterns for the user. The application onboards the user through a module of psychoeducation shown in the image below:

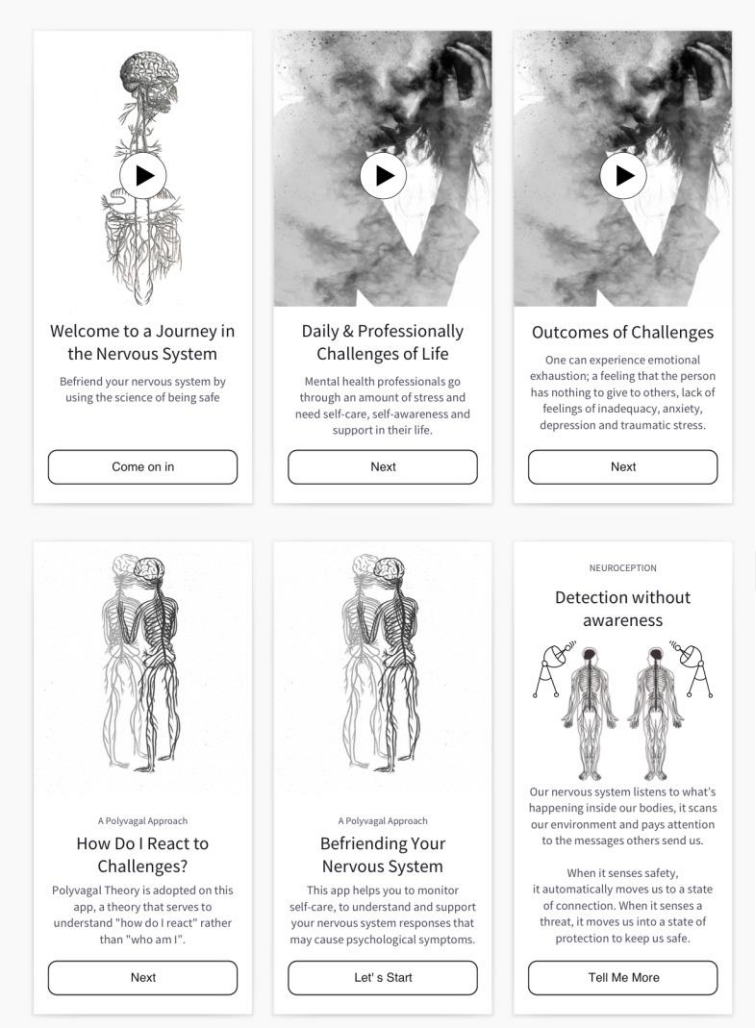

Image 4.1 The Safer Journey App Onboarding Screens

The second part of the app is based on Deb Dana's BASIC framework. This section is a series of exercises helping users identify their ANS responses and state, tracking their symptoms, and anchoring their landmarks by using BASIC. The letters BASIC stand for Befriend, Attend, Shape, Integrate, Connect. These exercises help the user

to gain autonomic control skills, resulting in enhanced response flexibility and resilience.

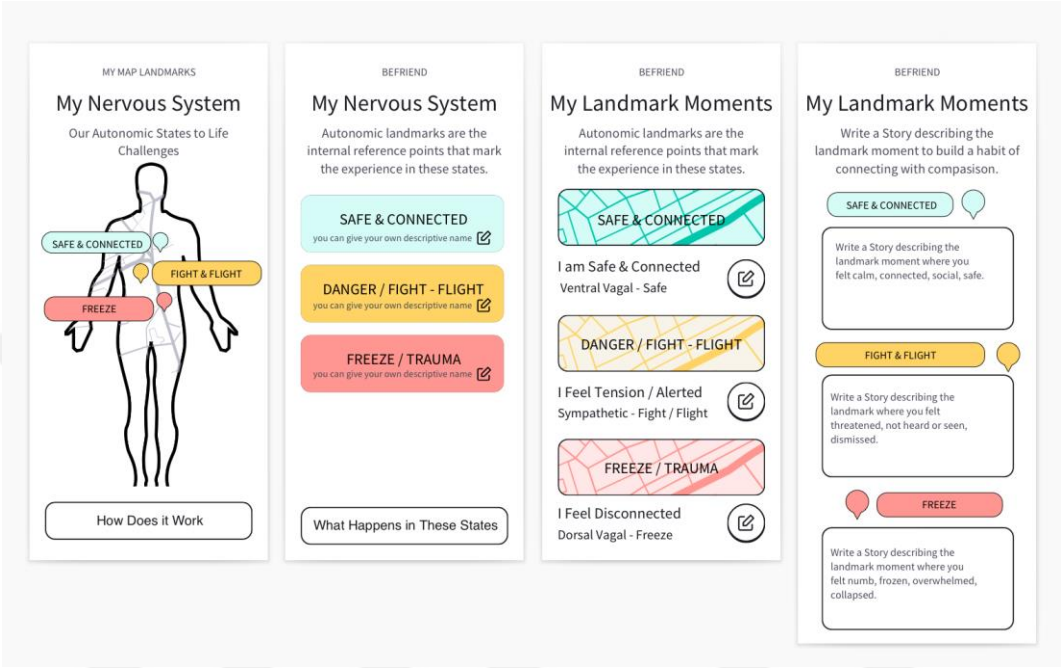

Image 4.2 The Basic Framework Exercise Screens

The utilization and combination of the multi-model polyvagal approach have the most impact. Therefore, future development includes incorporating a combination of polyvagal exercises to integrate other variety of practices including breathwork, exercise, and grounding exercises.

CHAPTER 5
RESULTS AND DISCUSSION

5.1. PRINCIPAL FINDINGS

This scoping review aimed to provide an overview of the Safer Journey prototype, examined by 10 mental health professionals using a Likert scale. For analysis the data is coded as follows:

- 1 = Strongly disagree
- 2 = Disagree
- 3 = Neutral
- 4 = Agree
- 5 = Strongly agree

8 out of 10 participants, strongly agree the purpose of this application is clear. 7 out of 10 strongly agree the information on the application is sufficient. All participants scored the applications' effectiveness highly. 9 out of 10 strongly agreed the purpose of this application is useful.

Informative Survey Feedback

- Including several somatic exercises to support the release of tension from the body by relaxing the vagus nerve as well.
- Integrating a voice note option for the writing exercises could make the app more convenient and less time-consuming for mental healthcare workers who are chronically overworked and thus don't have a lot of time.
- Full survey response available (Appendix B).

5.2. STRENGTH AND LIMITATIONS

5.2.1. Strengths

1. **Unique**. No other mobile application for mental health professionals using the Polyvagal Theory is found in Turkey.
2. **Evidence-Based**. The application content is based on scientific studies.
3. **Accessibility.** Applications are easy to access and provides privacy.
4. **Multi-modal**. The application can be used to support a variety of symptoms for depression, stress, and anxiety.
5. **Participation**. Data collection by the online survey was voluntary.

5.2.2. Limitations

1. **Scope**. Evaluation conducted only by mental health professionals; future studies can be expanded to include all health professionals.
2. **Small Sample Size**. A total of 10 experts volunteered for the evaluation of the application with the possibility to reach more people in future studies.
3. **Integration**. The text-based content can be enhanced with integrative exercises and techniques, such as video content, music therapy, meditation practices, and breathwork and grounding techniques.
4. **User Interface Design**. A high-fidelity prototype was used which does not demonstrate the full usability and a polished interface design.

In the short term, mobile application interventions can improve some aspects of negative mental health, and when used regularly, they can increase positive mental health. To investigate the long-term consequences of these apps, more research is needed.

CHAPTER 6
CONCLUSION

Mental health professionals are subjected to tremendous stress in their field of work. Professionals in this industry are prone to burnout, secondary traumatic stress, depression, compassion fatigue, and anxiety, especially given the workload of the 2020 Covid-19 Pandemic. MHP are dealing with a heavy workload, physical weariness, and exposure to a variety of disasters. High levels of stress, insomnia, anxiety, sadness, and burnout have been reported by MHP. There is also a possibility that MHP may develop secondary traumatic stress, depending on the level of risk they are exposed to. Compassion fatigue, burnout, and secondary traumatization are among the psychological problems that mental health professionals frequently experience. To manage stress and create psychological resilience, professionals need self-care, self-awareness, and support in their sector. Our perspective of happiness depends on our ability to adjust in all parts of our lives: physical, mental, emotional, and social. This requires a holistic approach. A Polyvagal Theory-based approach allows the integration of all these factors.

The study of this mobile application prototype, which was developed based on Polyvagal Theory, was examined by 10 experts in the field, and face validity was examined to support the well-being of these mental health professionals. The prototype has been found useful and effective. Future studies are aimed to develop the scope to include all health professionals, and the efficacy can be measured by a wider user range. The content of the application is aimed to integrate a variety of techniques such as breathwork, meditation, and somatic techniques. Future development of the prototype will include an enhanced user interface design and the application can be translated for a more integrative experience.

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APPENDIX A. STUDY CONSENT FORM

Dear Participant,

This research is carried out within the scope of Istanbul Bilgi University, Institute of Health Sciences, Trauma, and Disaster Studies Applied Mental Health Master's Program. It is a master thesis study conducted by Selen Ataç under the supervision of Prof. Dr. Tamer Aker.

In this research, it is aimed to bring a digital solution in order to support the well-being of mental health workers and increase their quality of life. In this context, it is aimed to develop a psycho-educational mobile application by adopting the Polyvagal Theory and to evaluate the effectiveness of the application.

The study is sent only to professional experts in the field of mental health. Participation is completely voluntary and you are not expected to declare any information that will reveal your identity on the forms. You have the right not to participate in the study or to stop working at any time after participating. Your answers will be kept completely confidential and will only be evaluated for scientific study and publication purposes.

The research is expected to take approximately 15-20 minutes. It is very important for the reliability of the study that you carefully read the questions in the forms and answer them accurately and completely without being pressured or intimidated by anyone. There are no right or wrong answers to the questions, please specify the most appropriate expression for you.

If you want to ask questions and get information about the study, you can contact Selen Ataç, a student at Istanbul Bilgi University Trauma and Disaster Studies Applied Mental Health Master's Program.

APPENDIX B. SOCIAL DEMOGRAPHICS

Category Variables	***N***	***Category Variables***	***N***
Gender		***Duration of profession***	
Kadın	*8*	*0-4 years*	*2*
Erkek	*2*	*5-9 years*	*3*
		10-14 years	*3*
Degree		*15 and up*	*2*
Undergraduate	*3*		
Masters Degree	*6*	***Covid-19 exposure***	
Doctarate	*1*	*Yes*	*8*
		No	*2*
Title			
Pyschiatrist		***Psychological or psychiatric support***	
Psychiatric Nurse	*1*	*Yes*	*8*
Psychologist	*4*	*No*	*2*
Psychologic Consultant	*1*		
Social Worker	*1*		
Consultant	*2*		
Location			
Turkey	*4*		
United Kingdom	*3*		
United States	*1*		
Cape Town	*1*		

APPENDIX C. RESULTS OF THE SURVEY

KEY FINDINGS	USER FEEDBACK
Addition of Polyvagal Techniques	While I find the writing exercises in the app very useful, I would suggest including several somatic exercises to support the release of tension from the body by relaxing the vagus nerve as well.
Addition of voice technology	Healthcare workers are chronically overworked and thus don't have a lot of time so perhaps integrating a voice note option for the writing exercises could make the app more convenient and less time-consuming for them.
Addition of engagement	I would add a comment part where people can share their experiences.
Addition of suggestive language	Sometimes it's hard for people to find the right words. That's why I wondered if survey/multiple-choice questions could be added instead of open-ended questions or statements in some exercises. It is not something that can be done for every exercise, but it can help some users.
Addition of navigation design	Visually short cuts/navigations for easy use can be included; for example, if something came to your mind or if you

	were in an event/thought or feeling, BASIC would be easily accessible.
	It will be good to log in to the notifications, entries, or stories you wrote before in the app.
Addition of resources	The "resource" page with this app can be helpful. Books to read, maybe lessons to go, health centers or places to get psychological support. Because after using this App, people may have extra psychological needs that they never thought of before.
Addition of language	The app can be translated into other languages.

Table 2 Prototype Survey Feedback

APPENDIX D. RESULT OF EVALUATION BY THE ETHICS COMMITTEE

Ethics Board Approval is available in the printed version of this dissertation.