

THESIS

MIND OVER MATTER: AN EXPLORATORY CASE STUDY OF MIND-BODY
INTERVENTIONS IN THE BURN UNIT

Submitted by

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ABSTRACT

MIND OVER MATTER: AN EXPLORATORY CASE STUDY OF MIND-BODY INTERVENTIONS IN THE BURN UNIT

Introduction: The aim of this case study was to explore the experience of five patients who participated in mind-body based occupational therapy (MB-OT) while in the burn unit. Individual responses to mind-body practices were assessed and patient perspectives were included to better understand what MB-OT brought to the recovery process.

Methods: This retrospective chart review included five patients admitted to the burn unit. Data were gathered from the electronic medical records (EMRs) to include demographics and burn characteristics, changes in vital signs throughout MB-OT meditation sessions, specifically, and before and after measures on the State-Trait Anxiety Inventory-6 (STAI-6), which was available for two patients. Additional information was obtained from occupational therapy documentation to better understand the unique experience of each patient with the MB-OT intervention. Inductive content analysis occurred within and across subjects to generate individual and over-arching themes.

Results: Patients experienced a reduction in heart rate during seven of the eight MB-OT meditation sessions, while a reduction in respiration rate was seen in four of these sessions. For two patients, STAI-6 measures were available and indicated a reduction in state-anxiety scores after MB-OT. Inductive coding within subjects revealed that patients self-generated a desired focus for MB-OT and perceived that MB-OT supported personal coping. Four themes emerged across documentation of all five patients and included 1) eagerness to explore mind-body practices; 2)

feelings of appreciation towards MB-OT; 3) MB-OT provided a sense of calm; 4) MB-OT supported daily occupations in the burn unit.

Conclusion: MB-OT was a client-driven intervention that complemented standard occupational therapy practice in the burn unit. MB-OT has the potential to support patients in coping with everyday aspects of life in the burn unit

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CHAPTER 1: INTRODUCTION

1.1 Purpose

This descriptive case study (Savin-Baden & Major, 2013) explores the physiological responses and personal perspectives of five patients who participated in mind-body based occupational therapy (MB-OT) while in the burn unit. MB-OT introduced patients to various mind-body practices, such as audio-meditation, yoga, and breathwork, designed to enhance everyday coping with life in the burn unit. Patients' personal experiences were detailed to provide insight into how mind-body practices supported their recovery in the burn unit.

1.2 Background

There are approximately 40,000 hospital admissions for burn-related injury in the United States each year. Of these hospitalizations, more than 60% are treated in a burn unit, which is a specialized unit equipped to care for complex burns (American Burn Association, 2017). Severe burns can result in devastating alterations to physical function, including reduced range of motion of the involved joints, chronic pain, or amputation. To minimize functional losses, occupational therapists employ a variety of treatment modalities including splinting, stretching and positioning to prevent contractures (Al-Mousawi, Mecott-Rivera, Jeschke, & Herndon, 2009; McGourty, Givens, & Fader, 1985). Common occupational therapy interventions in the burn unit may also include desensitization techniques, scar massage, and education on daily stretching routines.

Beyond treatment modalities, occupational therapists advocate for the independence of their clients and provide opportunities to engage with the environment. In a setting such as the burn unit, patients' previous routines are severely disrupted, and they may find themselves in a state of occupational deprivation. Occupational deprivation, which occurs when factors outside one's control preclude him/her from participating in their everyday occupations (Whiteford, 2000).

A variety of factors can impact a patient's ability to participate in occupations while in the burn unit. For example, upper extremity splinting protocols can limit a patient from using his or her arms to perform grooming tasks. Unpredictable care schedules may keep a patient confined to his/her room, awaiting procedures. Or, persistent pain can impact a patient's desire to self-feed, mobilize, or participate in occupational therapy. Occupational therapists are attuned to the impact an impairment or environment can have on a person's health and healing and across settings and use purposeful activities as a means of engaging patients in the rehabilitative process.

Burn survivors have reported increased pain and distress during rehabilitation therapy, specifically occupational and physical therapy (Maani et al., 2011). However, active participation is imperative to achieve functional outcomes as damaged tissue heals. In the burn unit, the rehabilitative process itself exposes patients to extreme physiological and psychological stressors, making it critical for occupational therapists in this setting to maintain an open dialogue with patients about their fears, pain, and anxiety (Carle, Darrow, Grady, & Bollig, 2017). When patients self-limit their participation in everyday activities, including occupational therapy, because of pain or distress, their long-term function can be severely impacted. It is therefore important to explore treatment techniques that can be used by occupational therapists in the burn unit to reduce distress and thus, allow for enhanced occupational performance in and out of therapy.

Mind-body interventions have the potential to be used by occupational therapists to help patients manage the daily associated with burn recovery. Introduction to mind-body practices in the acute stages of burn trauma may provide patients with a new occupation to explore in the restrictive environment of the burn unit. Mind-body interventions include an array of techniques such as yoga, meditation, Tai Chi, deep breathing, imagery, and progressive muscle relaxation (National Center for Complementary and Integrative Health, 2017). These practices emphasize the

mind-body connection and its positive impact on emotional, behavioral and spiritual health (National Center for Complementary and Integrative Health, 2017). With the general population, mind-body practices have been shown to reduce anxiety and stress, decrease blood pressure, increase oxygen saturation, and enhance breathing (Chugh-Gupta, Baldassarre, & Vrkljan, 2013; J.A., 2008; Wahbeh, Elsas, & Oken, 2008)(18-22). While there has been minimal research on mind-body practices with the burn population specifically, preliminary research suggests that deep-breathing and audio-guided relaxation can decrease pain and anxiety during painful wound care procedures (Achterberg, Kenner, & Lawlis, 1988; Park, Oh, & Kim, 2013).

To our knowledge, research on the use of mind-body techniques in the burn unit is limited to the context of wound care. The present study seeks to broaden the application of mind-body practices beyond wound care, by incorporating mind-body practices into routine OT treatment for patients in the burn unit. This case study explores the physiological and emotional responses of five patients who participated in mind-body based occupational therapy (MB-OT) while in the burn unit. Their personal experiences provide insight into how mind-body practices can support daily life in the burn unit.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter provides a comprehensive literature review, covering the implications of burn injury. Further, it explores the application of mind-body interventions in the burn unit. To begin, a description of the research setting where the study occurred. Next, the physical and psychological implications of burn injury are discussed. Then, the role of occupational therapy in the burn unit is explained followed by an overview of the research on mind-body practice as it relates to physiological responses and perceptions of pain and distress. Finally, gaps in the literature are identified and justification for the present study is provided.

2.2 Overview Burn Unit at University of Colorado Hospital

The University of Colorado Hospital (UCH), located in Aurora, CO, is known for its delivery of specialized services. UCH is home to the Burn Center, which includes a burn clinic for outpatient services, a step-down ICU, and a nine-bed burn/trauma ICU. The Burn Center treats a variety of conditions related to soft tissue injury, including but not limited to, burns, rashes, frostbite, and necrotizing fasciitis. Patients are treated by a multidisciplinary team of surgeons, psychiatrists, social workers, nurses, occupational therapists, physical therapists, and others to maximize recovery ("UCHealth Burn Center at Anschutz," 2018). The UCH Burn Center is the only burn center verified by the American Burn Association (ABA) in the state of Colorado ("University of Colorado Hospital Authority Revenue and Refunding Revenue Bonds", 2015).

ABA-verified burn centers are qualified to treat patients with: partial and full thickness burns; circumferential burns; burns to hands, feet, face and other major joints; burns covering more than 10% of the total body surface area (TBSA); and those requiring special emotional, social, or rehabilitative interventions (Ray et al., 2017). Because continuity of care supports physical and

psychological healing, patients usually remain in ABA burn centers until they are discharged back into the community. While continuity of care is important for burn recovery, it can result in lengthy hospital stays which may cause patients clinical distress (Ray et al., 2017). Length of stay in a burn unit typically equates to one day per 1% TBSA burned. However, a variety of factors, such as burn depth, infection, or complications from surgery can increase the length of stay (Louise, David, & John, 2014).

2.3 Role of Occupational Therapy in the Burn Unit

Occupational therapy is founded on the notion that health and well-being are inextricably linked to participation in meaningful occupations. Thus, occupational therapists across settings seek to provide opportunities for clients to engage in various activities that give meaning to the passage of time. However, patients in hospitals may experience disruption to their routines and find that participation in daily occupations is hindered by an impairment or the medical environment itself. Patients in hospitals are at risk for occupational deprivation, which occurs when factors outside one's control limit participation in everyday occupations. A variety of factors can impact a patient's ability to participate in daily occupations while in the burn unit, specifically. A variety of factors can impact a patient's ability to participate in occupations while in the burn unit. For example, upper extremity splinting protocols can limit a patient from using his or her arms to perform grooming tasks. Unpredictable care schedules may keep a patient confined to his/her room, awaiting procedures. Or, persistent pain can impact a patient's desire to self-feed, mobilize, or participate in occupational therapy. Further, one's mental well-being can be threatened by exposure to painful procedures, loss of autonomy, and impending uncertainty while in the burn unit.

Occupational therapists are acutely aware of the impact of burn trauma on health and well-being, as such, they advocate for the mental health needs of patients in recovery. Quality of life and emotional well-being are major concerns for occupational therapists in the burn setting, as routine exposure to pain and distress may perpetuate feelings of anxiety. Given the complex nature of burn trauma, the role of occupational therapy in the burn unit is multifaceted to meet the comprehensive physical and emotional needs of patients. Occupational therapists in the burn unit help patients establish new roles, routines, and habits for post-injury life. Through environmental modification, therapists help patients participate in self-care tasks, such as feeding and grooming, and use purposeful movements to facilitate stretching and mobilization. To address the physical implications of burn injury, occupational therapists use a variety of treatment modalities to minimize functional losses as the skin heals. Such modalities can include splinting, stretching, and positioning, to prevent contractures and maintain range of motion (Al-Mousawi et al., 2009; McGourty et al., 1985). Because occupational therapy treatment in the burn setting can be distressing to patients, therapists often invest substantial energy into providing explanations, motivating patients, and building trust with patients (Al-Mousawi et al., 2009).

As the body recovers from a burn, participation in occupational therapy is necessary to improve performance in everyday occupations. However, patients often associate pain and distress with the rehabilitation process, which can limit their participation (Maani et al., 2011). Therefore, it is important to explore techniques that can be incorporated into occupational therapy treatment to help patients manage the stressors associated with daily life. One possible approach includes a broad class of practices known as mind-body techniques, which have been reportedly used by occupational therapists in a variety of clinical settings to manage symptoms of anxiety and pain, while simultaneously improving quality of life (Hardison & Roll, 2016).

2.4 Overview of Burn Injury

The road to recovery for a burn survivor is all-encompassing and takes an enormous toll on an individual's physical functioning and emotional well-being. Patients in this setting may face extreme stress as they reconcile with their new role as a *burn survivor* and manage the stressors associated with recovery. Severe burns can result in a loss of independence and have devastating physical implications, including chronic pain, contractures, amputation, and heterotrophic ossification. During the acute and rehabilitative stages of recovery, patients experience high degrees of pain on a daily basis, between wound care and physical and occupational therapy interventions. Routine exposure to physical and emotional stressors, including pain, may exacerbate feelings of anxiety and negatively impact mental health.

Stages of Burn Injury

It has been proposed that burn recovery consists of four defined phases that are characterized by varying symptoms: admissions phase; critical care phase; in-hospital recuperation phase; and the rehabilitation and reintegration phase (Blakeney, Rosenberg, Rosenberg, & Faber, 2008). The *admission phase* is associated with anxiety, terror, and pain. During this time, practitioners should offer routine reassurance and establish a strong rapport with patients. During the *critical care phase*, patients experience increased anxiety related to fear of death, procedures, and uncertainty. These stressors can manifest into more serious consequences of depersonalization, dissociation, or acute stress disorder (ASD). Disorientation, delirium and vivid nightmares are common symptoms during the critical care phase. While patients can be treated with antianxiety medication and analgesics, therapists can offer reorientation techniques and create a soothing environment by speaking softly, dimming lights, and remaining calm. In addition, staff should help patients focus on the present by reminding them they are safe with the burn team and they are healing each day

(Blakeney et al., 2008).

During the *in-hospital recuperation* phase, patients begin to grapple with physical changes to their body, and anxious thoughts evolve into worry of the future (Blakeney et al., 2008). Patients can demonstrate emotional lability, as they reconcile the loss of their premorbid identity and begin to cope with an altered appearance and changes in function. As the length of stay increases, patients may struggle with feelings of hopelessness, especially if they perceive a loss of autonomy and lack of control (Blakeney et al., 2008; Rafii, Oskouie, & Nikraves, 2007). When possible, practitioners should structure treatment to provide a sense of control by giving choices and making mutual goals. During the *reintegration phase*, patients prepare to re-enter society and leave the safety of the burn unit. As survivors return to their previous life, they may experience social ridicule, changes in autonomy, and continued feelings of helplessness. Expected symptoms during the reintegration phase are post-traumatic stress disorder (PTSD), depression, and anxiety. Practitioners in the burn unit can prepare patients for community reintegration by equipping them with techniques to improve long-term coping with their altered life (Blakeney et al., 2008).

Mental Health Concerns for Patients in the Burn Unit

Burn survivors report a high presence of at least one DSM Axis I Disorder after the onset of injury, most commonly depression, anxiety, and post-traumatic stress disorder (PTSD) (Logsetty et al., 2016). The mental health status of patients in the burn unit is closely monitored, as this population is also at high risk of developing acute stress disorder (ASD) within the first 30 days of the burn incident. In the acute care phase, ASD has been found in 11-32% of adult burn survivors (Esselman, Thombs, Magyar-Russell, & Fauerbach, 2006). It is important for the burn care team to monitor patients for ASD, as previous studies suggest positive scores on the Acute Stress Disorder Scale within the first 30 days of trauma correlate with the development of PTSD

(Bryant, Moulds, & Guthrie, 2000; Edmondson, Mills, & Park, 2010). Routine ASD/PTSD screens allow the burn care team to respond proactively to patients who may be at risk for ASD and PTSD.

Post-traumatic stress in the early stages of burn recovery has been associated with long-term consequences, including poor psychological adjustment and development of PTSD (Difede et al., 2002; Falder et al., 2009; Van Loey, Maas, Faber, & Taal, 2003). In the later stages of recovery, PTSD has been found in 20-45% of burn survivors (Esselman et al., 2006). Both ASD and PTSD are mental health conditions triggered by a traumatic event that can hinder occupational function. ASD and PTSD are similar in symptomology and can include: distress; flashbacks; dissociative behaviors; physiological reactions to reminders of the event; and alterations in mood (American Psychiatric Association, 2019). An ASD diagnosis, however, occurs within the first month of trauma while a PTSD diagnosis occurs at least one month after the trauma (American Psychiatric Association, 2019).

PTSD can negatively impact an individual's well-being and pose barriers to the rehabilitation process (Fukunishi, 1998; Giannoni-Pastor, Eiroa-Orosa, Fidel Kinori, Arguello, & Casas, 2016). Patients in the burn unit may feel re-traumatized by unavoidable procedures, unexpected pain, and a perceived lack of control (Carle et al., 2017). To mitigate the effects of re-traumatization and perpetuation of post-traumatic stress symptoms, it is important for occupational therapists to provide patients with a sense of control by offering choices and establishing collaborative therapeutic goals (Carle et al., 2017; DeCandia, Guarino, & Clervil, 2014). Additionally, occupational therapists should maintain an open dialogue about the patients' daily triggers and perceptions of pain to further limit the effects of post-traumatic stress (Carle et al., 2017).

Implications of Pain and Distress

Pain is an inevitable aspect of burn injury and has been described as a “living hell” by burn survivors (Iafrazi, 1986). Across the burn literature, pain has been identified as a factor that negatively impacts the recovery process (Abrams, Ogletree, Ratnapradipa, & Neumeister, 2016; Kornhaber, Wilson, Abu-Qamar, & McLean, 2014; Williams, Davey, & Klock-Powell, 2003). Burn survivors who reported greater pain during early hospitalization, also reported poorer adjustment after discharge, making pain management a top priority for the burn care team (Patterson, Tininenko, & Ptacek, 2006). However, the majority of research on pain management techniques within the burn population occurs in the context of wound care, which is a painful process that involves the removal of slough and eschar from wounds to prevent infection. While analgesics are commonly used to manage pain during wound care, there is increasing support for the adjunctive use of non-pharmacological interventions, such as music therapy, virtual reality, and breathing exercises (Maani et al., 2011; Najafi Ghezeljeh, Mohades Ardebili, Rafii, & Haghani, 2016; Park et al., 2013).

For a burn survivor, much of the day is spent anticipating painful procedures such as wound care, physical and occupational therapy, during which patients have reported excruciating pain (Maani et al., 2011). Rehabilitation in the burn unit requires manipulation of inflamed and damaged tissue which can induce intense pain for several minutes to hours following treatment ((Summer, Puntillo, Miaskowski, Green, & Levine, 2007). However, the pain associated with rehabilitation may limit a patient’s tolerance for occupational therapy, which can then impact long-term functional outcomes. Further, recurrent pain can keep already traumatized patients in a perpetual state of anxiety and negatively impact their quality of life and coping abilities, making pain and distress an important consideration for occupational therapists in the burn setting

(DeCandia et al., 2014). It is therefore important to explore treatment techniques that can be used by occupational therapists in the burn unit to reduce pain and distress and thus, allow for enhanced occupational engagement and well-being, in and out of therapy.

2.5 Mind-Body Interventions

Mind-body practices can help facilitate a connection between one's mind, body, and behavior. Examples of these practices include yoga, meditation, breathwork, and guided imagery to name a few (National Center for Complementary and Integrative Health, 2017). In the general population, mind-body practices have demonstrated an array of benefits. For example, breathwork and yoga have been shown to slow the body's physiological reaction to stress by reducing heart rate and blood pressure, while increasing oxygen consumption (Akhtar, Yardi, & Akhtar, 2013; Mason et al., 2013; Pavlov & Tracey, 2012). In addition, the benefits of meditation have also been widely studied and suggest that meditative practice can decrease blood pressure, relieve pain, and improve anxiety and depression (Astin, Shapiro, Eisenberg, & Forys, 2003).

Mind-body practices have become secularized in Western culture and are frequently used by health care professionals in a variety of clinical settings to help patients manage stress and increase overall wellness (Hardison & Roll, 2016). Schmid et al. (2015) found that patients in an inpatient rehabilitation unit perceived that yoga improved their recovery and positively influenced their breathing, anxiety, pain and coping. Additionally, a case study done in the intensive care unit suggested that yoga and breathwork can reduce heart rate and respiration rate (Provancha-Romeo et al., in press; Schmid et al., 2015). Given the holistic philosophy of occupational therapy, mind-body techniques have the potential to form the basis of effective interventions to help patients better manage pain and stress in a variety of clinical settings. While the use of mind-body practices has been documented with various conditions, including stroke, cancer, and traumatic brain injury,

there is limited evidence on the application of such techniques within the burn population, specifically in the burn unit.

2.6 Gaps in Research

There is some emerging evidence to suggest that yoga, breathwork, and guided relaxation can reduce pain and anxiety for burn survivors. In the acute stages of burn recovery, deep-breathing, audio-guided relaxation, and imagery were shown to decrease levels of pain and anxiety for patients during wound care (Achterberg et al., 1988). An additional study by Park, Oh & Kim (2013), found that patients in the burn unit, who engaged in relaxation breathing techniques during wound care, experienced a significant reduction in pain and anxiety. However, research on the use of mind-body techniques in the burn unit is limited to the context of wound care. Therefore, the present study seeks to broaden the application of mind-body practices beyond wound care, by incorporating mind-body practices into routine occupational therapy treatment for patients in the burn unit. Further, a literature review by De Jong & Gamel (2006), highlighted the need to investigate the perspectives of burn survivors who used mind-body practices during recovery, to better understand their perceived benefits and continued use of such practices. As such, the present study is framed as a case study to explore the lived experience of five patients who participated in mind-body interventions while in the burn unit.

CHAPTER 3: METHODS

3.1 Study Design

The present study was approved for exemption by the Institutional Review Board at the affiliated hospital. Through a retrospective chart review, data for five patients, who participated in MB-OT, were obtained from the electronic medical records (EMRs) to develop this descriptive case study (Savin-Baden & Major, 2013). Multiple sources of information, including quantitative and qualitative data, were obtained from the EMRs to provide a comprehensive understanding of the five cases (Salminen, Harra, & Lautamo, 2006).

3.2 Recruitment and Participants

Information from a patient's electronic medical record (EMR) was used if information met the following inclusion criteria: 18 years or older; admitted to the burn unit within the last two years; English speaking; recipient of occupational therapy services; voluntarily participated in at least one MB-OT session. Over a three-month period, the majority of patients on the OT caseload were offered the option to explore mind-body practices as part of routine care. Five patients opted for MB-OT and provided verbal consent to participate. Data from the EMRs of the five participating patients were then included in the retrospective chart review. While the number of patients who declined to participate in MB-OT was not documented, the most common reason for declining was personal disinterest in mind-body practices.

3.3 Study Procedures

MB-OT was delivered by two OTs in the burn unit, one of whom was a student at the time (first author, AKA), and one of whom was a certified yoga teacher (second author, ALH). ALH had previous experience using mind-body interventions in OT practices and properly trained AKA in MB-OT delivery. All documentation included in the retrospective chart review was written by

the AKA and ALH. As a matter of standard care, the OTs fully documented their novel use of mind-body practices with the five patients who opted into the MB-OT.

3.3.1 Data Collection Procedures

Data collected from the EMRs included demographics and burn characteristics and SOAP note documentation, written after each MB-OT session. Demographics included age, gender, and race. Burn characteristics were used to describe the total body surface area (TBSA) burned, mechanism of burn, and individual length of stay in the burn unit. The following data were derived from SOAP note documentation, specifically: occupational profiles, physiological responses to MB-OT meditation sessions, pretest/post-test scores on the State-Trait Anxiety Inventory-6 (STAI-6), and subjective statements made during MB-OT.

SOAP notes include subjective statements made by patients, objective measures taken during treatment, an assessment of the session, and plans for follow up. The subjective and assessment sections of documentation were densely written, as the OTs wanted to fully capture what patients said and did during MB-OT. Vital signs and scores on the State-Trait Anxiety Inventory-6 (STAI-6) were recorded in the objective section of the SOAP note to monitor patients' objective response to mind-body practices.

Quantitative Data Collection

Vital signs. During MB-OT audio-meditation sessions, specifically, the OTs monitored vital signs, including heart rate, respiration rate, and blood oxygen saturation. Vital signs were obtained from a pulse oximeter or bed monitor. Vital signs were recorded across three intervals, before, during, and after audio-meditation sessions, and changes were included in the documentation. By tracking changes in vitals, the OTs could monitor the safety of mind-body interventions and provide patients with biofeedback at the conclusion of audio-meditation.

STAI-6. Two of the five patients reported recurrent feelings of anxiety, so the OTs administered the STAI-6 before and after each MB-OT practice sessions to provide an objective measure for changes in state anxiety. The STAI-6 has good internal reliability (Cronbach's alpha 0.82) and is highly correlated with the long-form STAI ($r= 0.95$), making it a practical assessment to use in a time-restricted environment, such as the burn unit (Court, Greenland, & Margrain, 2010). Using a Likert scale, patients rated the degree to which they felt calm, content, relaxed, tense, upset, and worried (Not at all =1; Somewhat = 2; Moderately = 3; Very much= 4). Positive items (calm, relaxed, content) are reverse scored, and the sum of all scores is then multiplied by 20/6. Total scores on the STAI-6 range from range 20-80. Higher scores correlate a higher degree of state anxiety. Average scores on the STAI-6 for the normal population fall between 34-36, while the average scores for people in stressful situations range from 50-61 (Bekker, Legare, Stacey, O'connor, & Lemyre, 2003).

Qualitative Data Collection

MB-OT SOAP Notes. Specific focus was given to the subjective and assessment sections of SOAP documentation. In the subjective section, the OTs recorded all relevant statements made by the patients during MB-OT. Subjective statements were obtained from the SOAP note, verbatim, to better understand patients' unique experiences and perspectives with MB-OT. In the assessment section, the OTs included a detailed description of the MB-OT session, duration of session, and interpretation of the patient's response. Information found in the assessment section provided insight into how MB-OT was implemented and how patients received it, from a professional perspective.

3.3.2 Intervention Procedures: Mind-Body based Occupational Therapy (MB-OT)

MB-OT was entirely client-centered to allow patients to explore and establish a mind-body

practice that met their unique needs in the burn unit. If agreed to participate in MB-OT, the OTs would first provide an educational session on mind-body practices and discuss how such practices could support daily life in the burn unit. In subsequent MB-OT sessions, OTs presented patients with a list of mind-body practices (see Table 1), adapted from the Walter Reed Mind-Body Medicine Program (cite). From this list, patients were asked to select practices of interest, which were then incorporated into OT treatment. MB-OT sought to give patients agency over their developing mindfulness practice and after each session, OTs would provide patients with resources for continued practice outside of therapy. MB-OT was phased out when patients reported satisfaction with their mindfulness practice, experienced a change in therapeutic priorities, or were discharged from the OT caseload.

3.4 Data Analysis

Quantitative Data

The OTs recorded vitals at the start, middle and end of all MB-OT meditation sessions, found in the EMRs. Percent change for heart rate and respiration rate were calculated between the start and end values, while blood oxygen saturation was simply monitored to ensure patients remained within safe limits. Additionally, percent change was calculated for STAI-6 scores before and after MB-OT practice sessions.

Qualitative Data

Qualitative data for all MB-OT sessions were transcribed into NVivo software for inductive content analysis. Inductive content analysis is recommended when there is limited knowledge of a phenomenon to allow themes to emerge from the available data (Elo & Kyngäs, 2008). Two researchers independently reviewed and coded qualitative data, first looking for themes within subjects – then looking for themes across subjects. Researchers then compared

inductive codes and themes until consensus was achieved. Throughout the coding process, efforts to increase the rigor of the study included frequent debriefing between coders and peer-review (Shenton, 2004). To enhance trustworthiness, the principal investigator maintained an audit trail, detailing all research activities and analysis procedures (Creswell & Miller, 2000). Lastly, researchers noted personal reflections throughout the data analysis process to enhance reflexivity and minimize bias.

CHAPTER 4: MANUSCRIPT

4.1 Introduction

There are approximately 40,000 hospital admissions for burn-related injury in the United States each year, and of these hospitalizations, more than 60% are treated in a burn unit, which is a specialized unit equipped to care for complex burns (American Burn Association, 2017). While on the burn unit, most patients advance through multiple stages of recovery, including critical care, acute recovery, and rehabilitation. Patients in the burn unit are confronted with a life-altering injury and often experience high degrees of pain and psychological distress. Patients have commented that the experience of pain in the acute stage of burn recovery is a “living hell” and report a high prevalence of at least one DSM Axis I Disorder after injury, most commonly depression, anxiety and post-traumatic stress disorder (PTSD) (Logsetty et al., 2016).

After sustaining a serious burn injury, a patient’s ability to participate in self-care, mobility, and other daily occupations may be compromised. Occupational therapists (OTs), however, partner with patients in the burn unit and support their return to independence through a variety of interventions, including splinting, stretching, and positioning. While these rehabilitative processes may expose patients to physiological and psychological distress, active participation is imperative to achieve functional outcomes as damaged tissue heals. OTs are concerned with the quality of life and mental health of patients in the burn unit and may offer various coping techniques to help patients manage daily stressors, both in the therapeutic context and the broader context of daily life in the burn unit.

Currently, OTs can, and are, using mind-body practices to help patients in various settings manage symptoms of anxiety and pain, while simultaneously improving quality of life (Hardison & Roll, 2016). Mind-body practices include an array of techniques, such as yoga, breathwork, and

meditation, aimed at connecting one's mind, body, and spirit. Within the burn unit, specifically, mind-body practices, including deep-breathing and audio-guided relaxation have been shown to reduce self-reported measures of pain and anxiety during daily wound care (Achterberg et al., 1988; Park et al., 2013). These findings suggest that mind-body interventions can reduce patients' experience of distress in the burn unit, however only in the context of wound care. The present study seeks to expand the application of mind-body practices beyond the context of wound, to understand how these practices can support client-centered, occupational therapy (OT) treatment. Informed OTs can facilitate the exploration of mind-body practices and support the development of a personal mindfulness practice that reflects individual coping needs. Mind-body interventions can target various physical and emotional needs of patients in the burn unit, including pain and anxiety, and may improve individual participation in the recovery process.

4.2 Aim

This case study explores the physiological responses and personal perspectives of five patients who participated in mind-body based occupational therapy (MB-OT) while in the burn unit. MB-OT introduced patients to various mind-body practices, such as audio-meditation, yoga, and breathwork, designed to enhance everyday coping with life in the burn unit. Patients' personal experiences were detailed to provide insight into how mind-body practices supported their recovery in the burn unit.

4.3 Methods

The present study was approved for exemption by the Institutional Review Board at the affiliated hospital. Through a retrospective chart review, data for five patients, who participated in MB-OT, were obtained from the electronic medical records (EMRs) to develop this descriptive case study (Savin-Baden & Major, 2013). Multiple sources of information, including quantitative

and qualitative data, were obtained from the EMRs to provide a comprehensive understanding of the five cases (Salminen et al., 2006).

4.3.1 Participants

Information from a patient's electronic medical record (EMR) was used if information met the following inclusion criteria: 18 years or older; admitted to the burn unit within the last two years; English speaking; recipient of occupational therapy services; voluntarily participated in at least one MB-OT session. Over a three-month period, the majority of patients on the OT caseload were offered the option to explore mind-body practices as part of routine care. Five patients opted for MB-OT and provided verbal consent to participate. Data from the EMRs of the five participating patients were then included in the retrospective chart review. While the number of patients who declined to participate in MB-OT was not documented, the most common reason for declining was personal disinterest in mind-body practices.

4.3.2 Study Procedures

MB-OT was delivered by two OTs in the burn unit, one of whom was a student at the time (first author, AKA), and one of whom was a certified yoga teacher (second author, ALH). ALH had previous experience using mind-body interventions in OT practices and properly trained AKA in MB-OT delivery. All documentation included in the retrospective chart review was written by the AKA and ALH. As a matter of standard care, the OTs fully documented their novel use of mind-body practices with the five patients who opted into MB-OT.

4.3.3 Data Collection Procedures

Data collected from the EMRs included demographics and burn characteristics and SOAP note documentation, written after each MB-OT session. Demographics included age, gender, and race. Burn characteristics were used to describe the total body surface area (TBSA) burned,

mechanism of burn, and individual length of stay in the burn unit. The following data were derived from SOAP note documentation, specifically: occupational profiles, physiological responses to MB-OT meditation sessions, pretest/post-test scores on the State-Trait Anxiety Inventory-6 (STAI-6), and subjective statements made during MB-OT.

SOAP notes include subjective statements made by patients, objective measures taken during treatment, an assessment of the session, and plans for follow up. The subjective and assessment sections of documentation were densely written, as the OTs wanted to fully capture what patients said and did during MB-OT. Vital signs and scores on the State-Trait Anxiety Inventory-6 (STAI-6) were recorded in the objective section of the SOAP note to monitor patients' objective response to mind-body practices.

Quantitative Data Collection

Vital signs. During MB-OT audio-meditation sessions, specifically, the OTs monitored vital signs, including heart rate, respiration rate, and blood oxygen saturation. Vital signs were obtained from a pulse oximeter or bed monitor. Vital signs were recorded across three intervals, before, during, and after audio-meditation sessions, and changes were included in documentation. By tracking changes in vitals, the OTs could monitor the safety of mind-body interventions and provide patients with biofeedback at the conclusion of audio-meditation.

STAI-6. Two of the five patients reported recurrent feelings of anxiety, so the OTs administered the STAI-6 before and after each MB-OT practice sessions to provide an objective measure for changes in state anxiety. The STAI-6 has good internal reliability (Cronbach's alpha 0.82) and is highly correlated with the long-form STAI ($r= 0.95$), making it a practical assessment to use in a time-restricted environment, such as the burn unit (Court et al., 2010). Using a Likert scale, patients rated the degree to which they felt calm, content, relaxed, tense,

upset, and worried (Not at all =1; Somewhat = 2; Moderately = 3; Very much= 4). Positive items (calm, relaxed, content) are reverse scored, and the sum of all scores is then multiplied by 20/6. Total scores on the STAI-6 range from range 20-80. Higher scores correlate a higher degree of state anxiety. Average scores on the STAI-6 for the normal population fall between 34-36, while the average scores for people in stressful situations range from 50-61 (Bekker et al., 2003).

Qualitative Data Collection

MB-OT SOAP Notes. Specific focus was given to the subjective and assessment sections of SOAP documentation. In the subjective section, the OTs recorded all relevant statements made by the patients during MB-OT. Subjective statements were obtained from the SOAP note, verbatim, to better understand patients' unique experiences and perspectives with MB-OT. In the assessment section, the OTs included a detailed description of the MB-OT session, duration of session, and interpretation of the patient's response. Information found in the assessment section provided insight into how MB-OT was implemented and how patients perceived it, from a professional perspective.

4.3.4 Intervention Procedures: Mind-body Based Occupational Therapy (MB-OT)

MB-OT was entirely client-centered to allow patients to explore and establish a mind-body practice that met their unique needs in the burn unit. If agreed to participate in MB-OT, the OTs would first provide an educational session on mind-body practices and discuss how such practices could support daily life in the burn unit. In subsequent MB-OT sessions, OTs presented patients with a list of mind-body practices (see Table 1), adapted from the Walter Reed Mind-Body Medicine Program (cite). From this list, patients were asked to select practices of interest, which were then incorporated into OT treatment. MB-OT sought to give patients agency over their developing mindfulness practice and after each session, OTs would provide patients with

resources for continued practice outside of therapy. MB-OT was phased out when patients reported satisfaction with their mindfulness practice, experienced a change in therapeutic priorities, or were discharged from the OT caseload.

4.3.5 Data Analyses

Quantitative Data

Vitals signs were taken during MB-OT sessions and were available in the EMRs of all five patients. The EMRs reported vital signs taken at the start, middle, and end of all MB-OT sessions. Percent decrease for vital signs was calculated between the start and end of MB-OT sessions. Additionally, the mean scores for the measures on the STAI-6 were reported before and after MB-OT sessions.

Qualitative Data

Qualitative data for all MB-OT sessions were transferred to NVivo software for inductive content analysis. Inductive content analysis is recommended when there is limited knowledge of a phenomenon to allow themes to emerge from the available data (Elo & Kyngäs, 2008). Two researchers independently reviewed and coded the qualitative data on two levels. First level coding occurred within subjects, while second level coding broadened across subjects to generate larger themes. Researchers then compared inductive codes and themes until consensus was achieved. Throughout the coding process, efforts to increase the rigor of the study included frequent debriefing between coders and peer-review (Shenton, 2004). To enhance trustworthiness, the principal investigator maintained an audit trail, detailing all research activities and analysis procedures (Creswell & Miller, 2000). Lastly, researchers noted personal reflections throughout the data analysis process to enhance reflexivity and minimize bias.

4.4 Results

An overview of patient demographics, burn characteristics, and occupational profiles are reported in Table 2. To maintain confidentiality, all patients were given a pseudonym, age was reported as a range, and approximate TBSA was described. An additional overview of all MB-OT sessions, including the description and duration of intervention, is provided in Table 3.

4.4.1 Quantitative Findings

Across all five patients, vital signs were available for a total number of eight MB-OT audio-meditation sessions (see Table 4). Patients experienced a reduction in heart rate during seven of the eight sessions, with one session showing no change. Changes in respiration rates were documented for six of the eight sessions. Four sessions showed a reduction in respiration rate, while one showed an increase in breathing and the other showed no change. Across all MB-OT sessions, patients' blood oxygen saturation remained within safe limits. As mentioned, the STAI-6 was administered before and after each MB-OT practice session for two of the five patients. Both patients experienced a reduction in STAI-6 scores after completing MB-OT, and reported increased feelings of calm, contentment and relaxation (see Table 5).

4.4.2 Qualitative Findings

Qualitative analysis occurred on two levels, first on the individual level and then across subjects for broader themes. Results from the first level analysis are provided as detailed case descriptions, recounting individual experiences with MB-OT. Further examination revealed that each patient self-generated a focus for their MB-OT intervention sessions. Examples of the self-generated focuses included: self-compassion, self-acceptance, conscious relaxation, purposeful movement, and stress management. The case descriptions below come from the patients' EMRs and include the following: prior experience with mind-body interventions; the self-generated focus

of MB-OT; mind-body interventions provided (see Table 5); and perceived outcomes.

Level I: Individual Case Descriptions and Self-Generated Focuses of MB-OT

Patient 1. Zack was an otherwise healthy young adult who enjoyed his family, hiking with his dogs, and going to concerts with his wife. Zack had no previous experience with mind-body practices, but his wife was experienced with yoga and supported his participation in such interventions. He had strong social support but struggled to move beyond feelings of self-criticism. Zack chose to focus MB-OT sessions on fostering feelings of self-compassion through meditation, tearfully sharing, “I’ve been horrible to myself”, his wife added, “He didn’t use to be so hard on himself. He’s always been confident and self-aware.” He participated in four MB-OT sessions, which consisted of: education on mind-body interventions; the creation of a positive mantra “I’m alive. I am loved”; self-compassion meditations; mindfulness practices, such as Finding Five Things; and video-yoga in the gym. The OT provided resources for independent practice, which Zack and his wife explored outside of therapy. Participation in MB-OT resulted in a perspective change for Zack, illustrated by the following quote:

Last week, and before all of this (referring to MB-OT), I felt like I was walking down lousy street. I was pessimistic about everything, would sometimes wake up at night crying...But I feel like I’ve turned a corner. I’ve had some back and forth days...last week was hard. But I like to be happy. I’m on my way there. Being able to tell myself ‘you are loved’ and this is a good thing, things like that...relieving tension in my body, Finding Five Things, and looking at all of my pictures set me on a positive path.

Patient 2. Jessica was a mother who had struggled on and off with addiction. She had experienced a traumatic loss, which caused her to relapse, and ultimately, lose custody of her children. In MB-OT sessions, Jessica shared that her mind was often preoccupied with feelings of guilt surrounding her relapse and anger towards the negative relationships in her life, which she blamed for her burn injury. Jessica shared that, prior to her burn, she attended yoga classes and found them to be a helpful tool in maintaining sobriety. Jessica’s personal emphasis for MB-OT

was self-acceptance, stating, “My intention is to create a new ‘safe’ atmosphere for myself in relationships...I want to start paying attention to my negative attributes that attract the wrong people, and not judge them, but accept them and make an effort to change.” Jessica completed three MB-OT sessions, which consisted of: education on mind-body techniques; the creation of a positive mantra, “give me the courage to accept the things I cannot change”; mindfulness practices such as Finding Five Things; mindful meditation focused on adopting an attitude of self-acceptance and non-judgment; and video-yoga in the gym. After completing an audio-meditation, Jessica reflected on the meditation narrative, “The line that hit me was when she (meditation narrator) talked about, *even while I am talking, it doesn’t change that other things are going on, the sound of a car, and the sound of the person next to you.* Just another reminder to accept things as they are...especially in here (referring to the burn unit)”. The OT provided Jessica with resources for independent practice, which she reported using daily. When reflecting on MB-OT, Jessica emphasized that sessions helped guide her towards a place of emotional readiness, to share her story, and accept her situation. Jessica’s personal goal of adopting an attitude of acceptance was realized in a burn support group meeting, evidenced in the following quote:

I could feel my heart speed up. Before I talked, I used the Finding Five Things and stared at a light fixture and noticed the paint was different colors. It had a screw loose. I stared at that light for like 30-45 seconds before I started talking. Then I took some breaths. Before sharing, I thought, accept what happened, I can say things in such a way and share without judgment. Our conversation definitely helped frame a mindset of acceptance for that moment. I was visualizing a tsunami crashing on me, but then I shared, and everything felt calmer. I felt empowered.

Patient 3. Liz was a resilient woman who had endured a challenging recovery and relied on her husband for support. She had a sense of humor, which persevered throughout her time in the burn unit. Her injury had left her with bilateral below-knee amputations and limited use of her upper-extremities, which significantly altered her ability to engage in occupations. Liz had no prior

experience with mind-body interventions but was receptive to MB-OT, stating, “I’m open to all of this. Anything could help.” Liz had recently felt overwhelmed by her perceived loss of control in the burn unit, tearfully stating, “I just feel like I don’t have control over anything. I woke up at 3 a.m. and they (nurses) had put a mask on me, and I didn’t go to bed with that. It just scared me. And I couldn’t reach for my call-light...Everyone keeps changing discharge plans on me and I just don’t know anymore.” Managing her phantom limb pain was an additional challenge for Liz, stating, “I can’t stop feeling the pain in my arm. It’s always there and it just feels like the pain is directly connected to my brain so I can’t not think about it.” To better manage anxiety and pain, Liz wanted to focus MB-OT sessions on conscious relaxation through breath work and meditation. Liz participated in three MB-OT sessions which included: education on mind-body techniques; creation of the mantra, “I surrender”; progressive muscle relaxation; breathing exercises; and relaxation meditation. Though resources were provided for independent practice, Liz relied on the OT to facilitate mind-body practices.

For Liz, the MB-OT sessions targeted anxiety and pain. For example, Liz would panic when sitting upright in therapy because the tightness of her skin limited her breathing. After learning MB-OT, Liz was guided through deep-breathing exercises during therapy to manage her anxiety during treatment. The OT documentation noted, “Patient able to manage rising stress through breath work, however, required cues to do so.” Additionally, when Liz fixated on her phantom limb pain, she was cued to take 10 controlled-breaths, which led to a calmed state and cessation of crying during two MB-OT sessions. MB-OT sessions allowed Liz to practice having a mindful reaction to stress and pain as opposed to an automatic reaction.

Patient 4. Chris was an outdoorsman who led a nomadic lifestyle that granted him year-round access to nature. Chris had minimal experience with mind-body interventions, but offered

relevant insight, sharing, “I have a disciplined mind. My brain knows what my body can handle, and I realize that I’m in control of my reactions...I do live my life with a positive perspective and work to keep my mind and body in unison.” Chris opted to focus MB-OT session on purposeful movement. He completed one MB-OT session which included education on mind-body techniques, mindfulness meditation, and video-yoga in the gym. The yoga video was selected to meet his goals of increasing arm extension, which had been limited by his upper extremity burns, and incorporating core strength for his return to mountain biking and climbing upon discharge.

Chris seemed to enjoy the holistic aspect of the MB-OT, commenting, “I liked the session today. It definitely felt like my core was more involved than yesterday which is key for mountain biking and climbing...It felt like a connection of the mind, body, and spirit. It was a good balance of work and relaxation, which you definitely need here”. Following MB-OT, Chris perceived a sense of opening, both emotionally and physically, offering, “I want to give love. I’ve been overwhelmed by the amount I’ve received since this happened. It speaks to the concept of you get back what you give.” The next day, Chris reflected on the MB-OT session, explaining, “It was amazing the difference just moving can make. I felt like once I got back to my room yesterday, my chest was open, my shoulders were back...I felt confident for the first time here.”

Patient 5. Rebecca was a mother to young children who relied on the support of her family and friends. She previously practiced yoga before moving to a new state. Rebecca was struggling to manage her anxiety about wound care, reporting, “I can’t do wound care. It is terrifying. I panicked yesterday because they just came and got me. I felt like I had no time to prepare.” Rebecca wanted to focus MB-OT interventions on establishing a stress-management routine prior to wound care, asking the OT, “Is there any way you could help me with meditations before my wound care?” This request was met, and after collaboration with the wound care team, MB-OT

was offered prior daily debridement. Rebecca participated in four MB-OT sessions, which included: education on mind-body interventions; creation of a positive mantra, “this is temporary”; breathing exercises relaxation meditation; and a yoga-video in the gym. Though resources were provided for independent practice, Rebecca relied on the OT to facilitate mind-body practices. MB-OT was used to create a routine to help Rebecca emotionally prepare for wound care, illustrated in the OT documentation, noting, “Patient continues to demonstrate increased anxiety during wound care, so OT provided the preparatory task of a 10-minute meditation to help her manage anxiety prior to wound care.” Rebecca appeared grateful for the MB-OT interventions and the temporary relief mind-body practices provided. After completing audio-meditations, Rebecca made comments such as, “That was nice. Very helpful” and “That was magnificent. Wow, I feel good. Thank you for that.”

Level II: Themes Across Patients

The second level of analysis spanned across subjects to generate broader themes about the patients’ experiences and perceptions of MB-OT. Four main themes emerged across patients, including an eagerness to explore mind-body practices, feelings of appreciation for the MB-OT intervention, MB-OT provided a sense of calm, and MB-OT supported daily occupations in the burn unit.

Theme 1: Eagerness to explore mind-body practices. OT documentation suggested that all five patients were eager to engage in MB-OT, evidenced by phrases such as, “patient eager to learn mind-body techniques”, “patient open and eager to use guided meditation as preparatory method”, “patient is eager to continue meditation practices”. Patients seemed to experience a collective sense of enthusiasm about adding something novel, like mind-body practices, to their daily routine in the burn unit and greeted MB-OT with an open attitude. For example, when Jessica

was asked about her interest in practicing meditation, she said, “I think that would be *super* helpful. I’m interested to try.” Liz and Zack expressed a similar sentiment. Liz stated, “I think that would be helpful. Let’s try,” while Zack said, “I’d like to try yoga. I like to try new things.” Rebecca had identified yoga as a meaningful occupation from her past and found the idea of practicing yoga in the burn unit to be highly motivating, telling the OT, “That (a yoga-video) would be amazing. Oh, that sounds wonderful right now.” Some patients continued to explore mind-body practices on their own and regularly asked for more resources, while others relied on the occupational therapist to facilitate exploration directly. Zack, Jessica, and Chris utilized resources provided in MB-OT and reported downloading meditation applications on their phones for independent practice. Liz and Rebecca however, reported having difficulty practicing independently, Liz confessed, “We tried doing a meditation this weekend, we wanted to but things got a little crazy.” Rebecca asked, “Is there any way you could help me with meditations before my wound care? I am just feeling out of it and it’s hard for me to remember where to find them.”

Theme 2: Feelings of appreciation towards MB-OT. OT documentation suggested that all five patients were appreciative of the MB-OT intervention, seen in the following statements, “patient expressed appreciation for time and discussion”, “patient continues to show interest and appreciation for recurring meditations”, “patient is appreciative of the opportunity to do guided meditation”. All patients had been described as “tearful” during at least one MB-OT session, as these sessions were often emotionally charged as patients talked through negative thoughts and daily stressors. Zack, who had been struggling with blame, expressed feelings of gratitude for the MB-OT intervention, sharing, “You guys helped me focus on the good things. I just appreciate it”. Rebecca frequently expressed appreciation for the routine MB-OT provided, thanking the OT each time meditation was provided before wound care.

Theme 3: MB-OT provided a sense of calm. During meditation practices, patients often experienced a decrease in heart rate and respiration rate, suggesting a calmer physiological state (see Table 4). Liz and Rebecca, specifically, commented on how meditation relieved tension in their body and increased feelings of relaxation and contentment, demonstrated through a change in their scores on the STAI-6 (see Table 5). Rebecca found a momentary escape from the unit through mind-body practices. Following meditation, she told the occupational therapist, “I feel like I went somewhere else. Like I really felt like I was at home. I don't know if you noticed this, but my fingers started moving because I was imagining myself at home shuffling through papers on my table. That's crazy. Didn't feel like I was here for a minute (referring to the burn unit.)” Both Rebecca and Liz noted a change in their emotional state immediately following meditation. Rebecca frequently commented on feeling “better” while Liz explained, “I always find something to worry about, but I feel relaxed now. I feel like I am calm and not as stressed for however long the meditation was...so what was that, 10 minutes? I felt calm for about 10 minutes afterward.”

Theme 4: MB-OT helped support daily life in the burn unit. Patients commented that the mind-body practices learned in MB-OT supported their routines and activities in the burn unit. Zack used the technique of Finding Five Things and relieving tension to get back to sleep when nursing staff woke him up. He also reported independent use of audio-meditations before physical therapy sessions and again before surgery to, “calm my nerves and get a good mindset.” Jessica felt better-prepared for wound care after MB-OT, saying, "I'm glad we are doing this before wound care. Helps me stay calm." Jessica reported independent carryover of mind-body techniques to wound care, saying, “I used the Finding Five Things first in wound care, and once I felt better, I focused on breathing." She also incorporated audio-meditation into her nightly routine, stating, “I've been meditating before bed every night and it really helps me relax.” Chris, who had

participated in video-yoga during MB-OT, independently practiced yoga poses in his room, telling the OT, “I was doing my own Zen stretches by the window this morning before you came to get me. It’s so nice to move around in my room on my own now.” While Rebecca attempted to use techniques learned in MB-OT during wound care, she found it difficult when her pain increased, and shared, “I was doing the square-breathing in the tub room and it helped, but as soon as the pain became excruciating it is near impossible to control your breath. Everyone in there tells you to breathe, but they have no idea what the pain is like.”

4.5 Discussion

The purpose of this case study was to examine the experience of five patients who participated in mind-body interventions while in the burn unit. Further, the case study aimed to describe the individual application of mind-body practices as part of OT treatment and detail the perspectives of patients about the value mind-body practices brought to recovery. This case study provides an example of how mind-body practices can be incorporated into individual care plans for patients in the burn unit. In previous studies on mind-body and relaxation techniques in the burn unit, the provided interventions were prescribed to patients, offering minimal to no choice about the content of intervention (Achterberg et al., 1988; Park et al., 2013). MB-OT, however, reflected the professional philosophy of OT, in that treatment was directly informed by the patient’s preferences (Tickle-Degnen, 2002). The present study demonstrated how to deliver client-centered care and help patients explore – and establish a mindfulness practice that their met their individual needs in the burn unit.

Overall, patients perceived MB-OT to be a positive and meaningful experience that provided a sense of calm. Specifically, patients seemed to experience a calmed physiological state during MB-OT, expressed as a reduction in heart rate and respiration rate. These findings are

similar to those of Provanca-Romeo et al. (in press), in which a single case study noted a reduction in heart rate and respiration following yoga and breathwork in the intensive care unit (ICU). In addition to a calmer physiological state, qualitative data suggests that mind-body practices supported daily life in the burn unit, while reductions in the STAI-6 suggest that mind-body practices may help reduce state-anxiety. Related to these findings, Schmid et al. (2015), found that patients in inpatient rehabilitation perceived that mind-body practices enhanced psychological well-being by improving their ability to cope and manage stress and anxiety. While patients in the present study did not explicitly report that mind-body practices enhanced coping, their independent use of such practices during stressful procedures, like wound care and support group, suggests they used mind-body practices to cope with daily stressors.

Following the first MB-OT session, patients began to integrate mind-body practices into their daily context, be it the creation of a nightly meditation routine, use of breathwork during wound care, or meditating before surgical intervention. These results suggest that patients were independently using mind-body practices to enhance daily routines and activities in the burn unit. In intense settings, like burn units, patients are at risk for occupational deprivation, but mind-body practices have the potential to combat this by providing patients with an accessible way to pass time between daily procedures. As patients demonstrated in this study, mind-body practices can become a new activity to explore in a hospital bed, the rehabilitation gym, tub room, or support group.

While mind-body interventions may offer tools for coping with recovery, an additional benefit of using mind-body practices with patients in intensive care settings, such as the burn unit, is that these techniques may promote feelings of control by allowing patients to control their breath, their thoughts, and their responses to the highly stimulating environment. Patients in the present

study commented on the stressful aspects of everyday life in the burn unit, ranging from managing pain, having difficulty sleeping, feeling fearful about procedures, and perceiving a loss of self-control. These stressors are congruent with those identified by patients in the intensive care unit (ICU)—with lack of control being the main psychological stressor (Novaes, Aronovich, Ferraz, & Knobel, 1997). Through MB-OT, however, patients used mind-body practices to control their responses to anxiety, the environment, and daily stressors. While some patients used meditation to alter the context of wound care, others used deep-breathing to control their physiological response to pain. While these results suggest a potential relationship between mind-body practices and perceptions of control, further research is needed to assess this hypothesis.

While not reported in the results, documentation revealed that the OTs in the study included various medical disciplines in the MB-OT experience. For example, two nurses sat in on a patient education-session of mind-body practices and provided additional opportunities for patients to explore the techniques learned in MB-OT. Coordination with the wound care team occurred on several occasions and enabled some patients to develop a meditation routine prior to the procedure. Additionally, wound care technicians were provided information about the patients preferred mind-body practices and encouraged to incorporate breathing cues, calming music, and audio-mediation into wound care, as appropriate. This suggests an opportunity for OTs to educate other disciplines on the benefits of mind-body practices and disseminate resources to promote continuity of care. Further exploration is needed to fully understand the impact of this intervention and whether other clinicians used the intervention during other aspects of burn care.

Limitations and Future Directions

It is important to note the first and second authors' direct involvement with the five patients in the case study, as they delivered and documented all MB-OT sessions. However, efforts to

minimize researcher bias were taken. OTs adhered to ethical and professional protocol when documenting MB-OT sessions and included objective-third parties throughout the data analysis process. Given the nature of case study research, the present study cannot show causality, nor can findings generalize to the broader population. While the MB-OT intervention followed a semi-structured format, it is in the early stages of development and is not yet a formalized intervention. Although the STAI-6 measure was only administered before and after MB-OT with two patients, results demonstrate that this may be a practical way to objectively measure changes in state anxiety. While this study supports the use of mind-body practices to support client-centered care, further research is needed to understand the influence of such practices on patients' tolerance for rehabilitative procedures in the burn unit. In addition, the present case study is limited to the context of the acute and rehabilitative phases of burn recovery, and future research should seek to understand the long-term carryover of mind-body practices learned in the burn unit.

4.6 Conclusion

This case study highlights the unique experience of five patients in using mind-body practices while in the burn unit. The MB-OT intervention provided client-centered care, aimed at enhancing the physical and emotional well-being of patients. Findings suggest that patients perceived the MB-OT intervention to be a valuable experience that supported their daily life in the burn unit. Further, patients experienced a reduction in heart rate and respiration rate, suggesting a calmer state, while two patients demonstrated a reduction in state-anxiety, as measured by the STAI-6. To our knowledge, this was the first study to explore the use of a client-driven, mind-body intervention in the burn unit. Further research is needed to assess the effectiveness of mind-body practices in the burn unit to optimize care for patients experiencing distress in their recovery.

4.7 Practice Implications

1. Mind-body practices can complement client-centered rehabilitation services. However, these practices are not for everyone, as we saw some patients decline participation in MB-OT.
2. Four of the five patients participated in at least one yoga session during MB-OT. Yoga can be used to promote purposeful movement of the affected joints and may help increase range of motion. It is ideal for the OT to be a certified yoga teacher. If not, we suggest the OT uses appropriate channels to facilitate.
3. Mind-body techniques can be modified to meet a variety of OT interventions, including preparatory tasks, education and training, and advocacy (Hardison & Roll, 2016).
4. OTs noted several challenges to facilitating MB-OT in the burn unit. For example, all five patients had a personal smartphone, which supported independent exploration of audio-meditations. In addition, patients with bandages on their hands had difficulty interfacing with smart devices and required assistance.
5. OTs can educate other disciplines on the use of mind-body practices and provide resources for continuity of care. This may require additional coordination and scheduling with the burn care team.

4.8 Tables

Table 1: List of MB-OT Practice Options

MB-OT Practice Options
<p>Relaxation & Breathwork: Techniques aimed at reducing stress</p> <ul style="list-style-type: none">a) Box-Breathing: Four-count inhale, four-count hold, four-count exhale, four-count holdb) Ten-Breaths: Series of 10 mindful breaths with a focus on the sensation of breathing
<p>Meditation: Audio-guided to facilitate relaxation and calm</p> <ul style="list-style-type: none">a) Progressive Muscle Relaxation: A Structured process of tensing and relaxing musclesb) Self-Compassion: Taking on an attitude of gentleness and care toward selfc) Mindful Check-In: Focusing awareness on thoughts and sensations without judgment
<p>Mindfulness: Paying attention to the present moment to reduce stress</p> <ul style="list-style-type: none">a) Finding Five Things: Grounding exercise that involves opening one's sense and scanning the environment for five things to explore with curiosity
<p>Positive Thinking: Intentionally focusing on positive mind states</p> <ul style="list-style-type: none">a) Positive/Healing Phrase: Redirecting negative thoughts with a positive phraseb) Resourcing: Focusing on something/someone that creates feelings of joy and security
<p>Yoga: Aimed at restoring the wholeness of the body and mind</p> <ul style="list-style-type: none">a) Incorporates physical postures, breathing exercises, sensory awareness and meditation

Table 2: Patient Demographics, Burn Characteristics, and Occupational Profiles

Patient	Gender	Age	Mechanism of burn	TBSA	Area of burn	Race	Length of stay	Occupational Profile
Zack	Male	20-25	Thermal burns from explosion	~ 47%	2 nd and 3 rd degree burns to face, neck hands/feet BUE, BLE	White	7 wks	Strong social support; married; previously active; enjoys hiking and animals; wife practices yoga
Jessica	Female	30-35	Thermal burns from explosion	~ 17%	2 nd and 3 rd degree burns to face, chest, hands/feet, BUE, BLE	White	2 wks	Minimal social support; history of, bipolar disorder, trauma, and drug abuse; mother; previous experience with yoga
Liz	Female	35-40	Thermal burns from accident	> 60%	2 nd and 3 rd degree burns to head, face, hands/feet, BUE, BLE, ant/post trunk, buttocks	White	1 yr	Strong social support; married; previously active and social in community; enjoys music
Chris	Male	45-50	Thermal burns from explosion	~ 12%	2 nd and 3 rd degree burns to face, hands, BUE	White	3 wks	Strong social support; single; history of cannabis abuse; previously lived in RV; nomadic lifestyle; enjoys socializing and outdoor activities
Rebecca	Female	40-45	Thermal burn from open flame	~ 18%	2 nd and 3 rd degree burns to feet, back, BUE, BLE	White	2.5 wks	Strong social support; married; history of trauma; mother; previous experience with yoga

*TBSA: Total Body Surface Area *BUE: bilateral upper extremities *BLE: bilateral lower extremities

Table 3: Summary of Client-Centered MB-OT Sessions

Patient	Description of MB-OT Session	Length
Zack	<p>Session One: - Education on mind-body techniques; resources provided</p> <p>Session Two: - 8-minute guided meditation (self-compassion) - Creation of manta</p> <p>Session Three: - Breathwork and stretching</p> <p>Session Four: - 12-minute yoga video; Standing and seated pose</p>	<p>38 minutes</p> <p>35 minutes</p> <p>25 minutes</p> <p>40 minutes</p>
Jessica	<p>Session One: - Education on mind-body techniques; resources provided</p> <p>Session Two:</p>	30 minutes
	<p>- Worksheet to set an intention for MB-OT - Creation of mantra - 10-minute guided meditation (mindful check-in)</p> <p>Session Three: - 12-minute yoga video seated on a mat; poses targeting wrists/legs - Educated on iPhone meditation app for independent practice</p>	<p>60 minutes</p> <p>40 minutes</p>
Liz	<p>Session One: - Education on mind-body techniques; resources provided</p> <p>Session Two: - 10-minute audio meditation (stress-relief) - Creation of mantra</p> <p>Session Three: - 17-minute audio meditation (relaxation)</p>	<p>55 minutes</p> <p>20 minutes</p> <p>30 minutes</p>
Chris	<p>Session One: - Education on mind-body techniques; resources provided - 10-minute meditation (self-compassion) - 10-minute yoga video; Standing and seated poses</p>	35 minutes
Rebecca	<p>Session One: - Education on mind-body techniques; resources provided - 10-minute audio meditation (stress-relief)</p> <p>Session Two: - 10-minute audio meditation (stress-relief) - Breathwork and stretching</p> <p>Session Three: - 11-minute yoga video with children - Seated poses targeting upper and lower extremities</p> <p>Session Four: - 10-minute audio meditation prior to wound care</p>	<p>50 minutes</p> <p>35 minutes</p> <p>44 minutes</p> <p>18 minutes</p>

Table 4: Vital Signs During Audio-Meditation

Vital Signs	HR					RR				O2		
	Session	Start	Middle	End	Start/End % decrease	Start	Middle	End	Start/End % decrease	Start	Middle	End
Zack	1	105	98	99	5.7%	13	8	9	30.7%	99	98	99
Jessica	1	91	89	89	2.1%	16	16	19	-18.9%	97	96	96
Liz	1	89	88	85	4.4%	18	17	18	0%	97	98	98
	2	76	75	74	2.6%	15	11	11	26.7%	99	100	100
Chris	1	105	87	87	17.1%	NA	NA	NA	NA	97	98	96
Rebecca	1	77	65	68	11.7%	NA	NA	NA	NA	97	94	94
	2	105	91	91	13.3%	22	17	14	36.4%	91	90	93
	3	86	85	86	0%	23	19	16	30.4%	99	95	95

HR = heart rate, recorded in beats per minute RR= respiration rate, recorded as breaths per minute O2= oxygen saturation, recorded as percent of oxygen in blood

Table 5: Self-reported Scores on the State-Trait Anxiety Inventory-6 (STAI-6)

Patient	Time	Calm	Tense	Upset	Relaxed	Content	Worried	Mean	% Decrease
Liz (S1)	Pre	2	3	1	2	2	4	56.67	41.18%
	Post	4	1	1	4	3	4	33.33	
Liz (S2)	Pre	2	3	1	2	2	2	50	13.34%
	Post	2	2	1	2	3	2	43.33	
Rebecca (S1)	Pre	1	2	4	1	1	4	73.33	63.63%
	Post	4	1	1	4	2	1	26.67	
Rebecca (S2)	Pre	1	2	4	1	1	4	70	52.38%
	Post	4	1	2	4	2	2	33.33	
Rebecca (S3)	Pre	2	4	1	3	2	4	56.67	17.64%
	Post	2	3	1	2	3	2	46.67	

(S)= Session; STAI-6 Scale: 1= Not at all; 2= Somewhat; 3= Moderately; 4=Very much; Scoring: Inverse scoring of positive items (calm, relaxed, content); sum of all scores is multiplied by 20/6 to achieve total score; Average population score = 34-36; Average score for stressed population= 50-6

CHAPTER 5: CONCLUSION

Implications to Occupational Therapy Practice

In the burn unit, patients are confronted with a life-altering injury and often experience high degrees of pain and psychological distress. While previous studies in the burn unit have demonstrated that mind-body practices can reduce pain and anxiety during wound care, the present study demonstrates that mind-body practice can, in fact, be applied to contexts beyond wound care (Achterberg et al., 1988; Park et al., 2013). Specifically, mind-body techniques can complement client-centered rehabilitation services by targeting the unique physical and emotional needs of patients as they manage the stressors associated with burn injury and recovery. While patients in the present study offered subjective accounts of using mind-body practices to both manage distress and enhance their routines in the burn unit, future studies are needed to quantify the impact of mind-body techniques on pain and anxiety patients the burn unit.

Perhaps, the most relevant finding to OT practice was the fact that patients reported independently using the mind-body practices learned in MB-OT to enhance their experience of other occupations in the burn unit. Examples included incorporating meditation into a nightly routine, deep-breathing during wound care, and using yoga as a purposeful activity to stretch injured joints and tissue. Mind-body techniques can be easily modified to meet a variety of OT intervention types, such as preparatory tasks, education, training and advocacy (Amini et al., 2014; Hardison & Roll, 2016). As seen in this study, OTs can facilitate a patient's exploration of mind-body techniques to promote an independent or supported practice. Further, mind-body practices have the potential to combat occupational deprivation many patients may experience in the burn unit. Through participation in MB-OT, patients experienced a meaningful way to occupy their minds through meditation and experience purposeful movement through yoga and

breathwork. OTs interested in utilizing mind-body techniques in clinical settings are encouraged to seek additional education on the topic to better understand the various ways in which mind-body interventions can support holistic practice and patient well-being.

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