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Complementary and Integrative Therapies for the Management of Insomnia in Chronic Disease: An Applied Research Project

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Complementary and Integrative Therapies for the Management of Insomnia in Chronic Disease:

An Applied Research Project

Juliana Sayner, Lisa Benson, Mary McKinley, Nicole Anderson

St. Catherine University

May 26, 2017

Abstract

One-half of all adults in America have a diagnosis of at least one chronic disease. Up to 80% of people with chronic diseases suffer from insomnia, creating a significant health burden. Healthcare providers (HCPs) do not routinely address insomnia and primarily use pharmaceuticals to manage insomnia. The purpose of this research is to co-create with HCPs an educational artifact that helps them inform their chronically ill patients about evidence-based complementary and integrative therapies (CIT) for insomnia management. Based on a design and development culture of inquiry and research method, we used the literature to create a preliminary educational artifact focused on four evidence-based CIT for insomnia management: aromatherapy, mindfulness meditation, relaxation and breathing techniques, and yoga. These modalities are safe, inexpensive, and accessible from home for individuals with chronic disease. We collected evaluative feedback from a convenience sample of HCPs. The top two factors impacting HCP integration of CIT into practice are lack of reimbursement and time constraints. HCPs support an artifact that addresses affordable, accessible, evidence-based modalities to complement conventional treatments for insomnia management. Since these integrative practices may be unfamiliar to some HCPs, our research confirms that an accessible educational artifact may effectively support the integration of aromatherapy, mindfulness meditation, relaxation and breathing techniques, and yoga into mainstream practices. We conclude our applied research with recommendations for the key components of an educational artifact.

Key words: aromatherapy, chronic disease, insomnia, mindfulness meditation, relaxation and breathing techniques, yoga

Dedications

We dedicate this to all the insomniacs of the world!

We also thank Gretchen Hildebrandt for her contributions to this project since she was an original member of our team, and we wish her the best.

Mary McKinley

I could not have made it this far without the encouragement, love, and support of my husband, family, and friends who are looking forward to seeing me again. They always stood beside me, supported me, and believed in me. I wish my husband could be here today to share this. Most importantly, to my team members, who with some thought, were persuaded by me that sleep could be a fascinating subject and leapt aboard the snooze train. Also to our professors who kept telling us we could make it, after all!

Juliana Sayner

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Lisa Benson

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Introduction

Sleep, and enough of it, is the prime necessity. Enough exercise and good food and enough are other necessities. But sleep—good sleep, and enough of it—this is a necessity without which you cannot have the exercise of use, nor the food.

(Hale, 1892).

Sleep deprivation is defined as a situation or condition of inadequate sleep (National Sleep Foundation, 2016). Sleep deprivation caused, in part, the Exxon Valdez grounding, Challenger explosion, and Chernobyl and Three Mile Island nuclear meltdowns (Huffington, 2013). According to the American Automobile Association (2016), an estimated 21% of fatal crashes are a result of inadequate sleep. Inadequate sleep leads to daytime dysfunction, decreased immunity, emotional vulnerability, decreased resilience, memory lapses, and serious disease processes as the lack of sleep progresses (Foley, Ancoli-Israel, Britz, & Walsh, 2004; Miller, 2009). The International Classification of Sleep Disorders identifies 81 forms of sleep disorders (Thorpy, 2012). One of the most common causes of sleep deprivation is chronic insomnia (refer to Appendix A for definition) (Léger & Bayon, 2010).

The defining characteristics of insomnia (refer to Appendix A for definition) are difficulty falling asleep, difficulty staying asleep, and feeling fatigued during the day (National Sleep Foundation, 2016). Insomnia becomes chronic when interrupted sleep occurs three or more nights per week, over at least one month (National Sleep Foundation, 2016). Chronic insomnia affects 10-35% of the general population (Heffron, 2014; Kozasa et al., 2010; Pearson, Johnson, & Nahin, 2006). Woodward (2011) and Miller (2009) observe that insomnia affects 30-80% of those with chronic conditions, such as anxiety, depression, pain disorders and cancer. Nearly half

of all adults in America are living with least one chronic disease (Centers for Disease Control and Prevention, 2015). The 2002 National Health Interview Survey lists over 50 comorbidities that may be associated with insomnia, such as anxiety, depression, congestive heart failure, diabetes, hypertension, and obesity topping the list (Pearson et al., 2006). Comorbid is defined as “a disease or other pathological process that occurs simultaneously and usually independently with another medical condition” (Comorbid, 2007). Chronic diseases, including insomnia, are inclusive of comorbidities (Bonnet & Arand, 2010; Roth, 2009).

Examples of the most frequently cited factors contributing to chronic insomnia include stress, anxiety, depression, and pain (Hall et al., 2007; Morin, Rodrigue, & Ivers, 2003; Riemann et al., 2010). Chronic conditions, such as pain and depression, are more prevalent in patients with insomnia and these conditions also contribute to insomnia by engaging a hyperarousal state and anxiety about sleep (Bonnet & Arand, 2010; Riemann et al., 2010). This connection suggests there is a bi-directional relationship between chronic conditions and insomnia (Pearson et al., 2006; Roth, 2009; Schutte-Rodin, Broch, Buysse, Dorsey, & Sateia, 2008). In mental health, the relationship between depression and insomnia is so interconnected it is not always apparent which malady preceded the other, the insomnia or the depression (Benca & Peterson, 2008; Miller, 2009; Roth, 2009). The presence of insomnia exacerbates symptoms such as pain and anxiety (Schutte-Rodin et al., 2008). When the stress of pain becomes chronic, it perpetuates a pathway of learned disrupted sleep behavior (Riemann et al., 2010). Hall et al. (2007) demonstrates that emotional stress is a correlate of physiologic arousal during non-REM sleep and the resulting disrupted sleep leads to further the chronicity of insomnia.

Due to the negative connection of insomnia and chronic disease, this topic is a significant

focus in research (Roth, 2009). According to Roth (2009), concurrently managing insomnia and comorbid chronic diseases may result in improved disease and insomnia outcomes, meaning that insomnia needs to be treated separately but simultaneously with the comorbid disease. Therefore, the management of insomnia should be an integral component of health maintenance; breaking the link between insomnia and chronic conditions can potentially improve disease management and promote healing (Pearson et al., 2006; Roth, 2009).

The impact of insomnia on health outcomes increases the cost of healthcare (Roth, 2009). According to Roth (2009), healthcare costs are 60% higher for individuals with insomnia than those without insomnia. Estimates of total insomnia-related costs in the United States have ranged from \$30 to \$107.5 billion per year (American Academy of Sleep Medicine [AASM], 2011; Léger & Bayon, 2010; Walsh & Engelhardt, 1999). These costs represent direct treatment costs, such as physician encounters and prescriptions, as well as indirect costs, such as consumption of medical services, increased accident risk, and lost workplace productivity. The National Institutes of Health [NIH] (2005) affirms the need to address insomnia due to the negative effect on both health maintenance and the exacerbation of pervasive health conditions. Until more effective management is achieved throughout the healthcare system, insomnia will remain both a healthcare and a financial burden to individuals and the economy (Roth, 2009).

When the US government began to fund initiatives to address sleep, the interest in insomnia research followed (Berger, 2009; Horne, 1992; Stanford University, 1999). In 1993, the NIH established the National Center for Sleep Disorders Research (NCSDR) (Stanford University, 1999). The NCSDR found that medical providers in the US lack adequate knowledge to identify and treat insomnia effectively, and two decades later this is still a problem (Sorscher,

2008). The study of sleep has become a principal endpoint of research instead of a symptom of other comorbidities (Berger, 2009; Roth, 2009). There continues to be much interest and debate in the management of insomnia primarily due to unclear guidelines for safe, long-term pharmaceutical treatments (Shahid, Chung, Phillipson, & Shapiro, 2012).

A pivotal piece of the debate over insomnia management involves the use of sleep aids called hypnotic pharmaceuticals. Insomnia management is generally the responsibility of the primary care physician, the most frequent prescribers of medications for insomnia (Shahid et al., 2012). Siriwardena, Qureshi, Gibson, Collier, and Latham (2006) found that many physicians have limited understanding of the availability and usage of sleep aids. The short-term use of pharmaceuticals can be beneficial (Saddichha, 2010; Takaesu, Komada, Asaoka, Kagimura, & Inoue, 2014; Vyas, 2013) but behavioral treatments also need to accompany use for long lasting results (Schutte-Rodin et al., 2008). Prior to 2005, the Food and Drug Administration (FDA) did not recommend the long-term use of hypnotics, in particular for the elderly and those with comorbidities, and since 2005 there are no defined guidelines for hypnotics beyond 12 months duration (Schutte-Rodin et al., 2008). The use of benzodiazepines in the elderly increases the risk by 5-fold of adverse cognitive changes and hospitalizations, and increases the occurrence of falls by 2.5-fold (McMillan, Aitken, & Holroyd-Leduc, 2013). Thus, treatment of insomnia becomes more complicated when other chronic diseases are present, and individuals are taking multiple pharmaceuticals (Benca, 2005; Schutte-Rodin et al., 2008).

There are effective non-pharmaceutical treatments also available for insomnia management. One such treatment is cognitive behavioral therapy for insomnia (CBT-I). CBT-I is the most effective behavioral therapy for insomnia, yet the dearth of trained professionals as well

as a high level of patient noncompliance make this treatment challenging (Benca, 2005; Ellis, Cushing, & Germain, 2015; Schutte-Rodin et al., 2008). Time and money involved in multiple visits and the perceived correlation with mental illness, (e.g., seeing a therapist), can cause patients to drop out of treatment (Mitchell, Gehrman, Perlis, & Umscheid, 2012). As a result, individuals who suffer from insomnia may seek out solutions independent of their primary care provider, such as complementary and integrative therapies (CIT) (Cuellar, Rogers, & Hisghman, 2007; Gooneratne, 2008; Kozasa et al., 2010; Pearson et al., 2006).

Emerging research provides evidence that CIT are safe and effective options for insomnia (Cuellar et al., 2007; Gooneratne, 2008; Kozasa et al., 2010; Lillehei & Halcon, 2014; Neuendorf et al., 2015). Systematic reviews of mind-body interventions for chronic insomnia conclude that yoga, tai chi chih, relaxation, and music therapy all offer favorable results with measurable improvement in sleep outcomes (de Niet, Tiemens, Lendemeijer, & Hutschemaekers, 2009; Kozasa, et al., 2010; Sarris & Byrne, 2011). Kozasa et al. (2010) suggest that that mind-body interventions offer a lasting subjective improvement in sleep in a review of twelve randomized controlled trials (RCTs) in older adult populations with insomnia. In the first systematic review of all notable CIT for insomnia, Sarris and Byrne (2011) find evidence to support acupuncture, yoga, and tai chi chih for reduction of sleep latency (SL) (refer to Appendix A for definition) and improved quality of sleep. Li et al. (2004) find that tai chi chih is also superior to low impact exercise in all parameters of insomnia. Multiple studies find improved wake after sleep onset (WASO) (refer to Appendix A for definition) and SL from cardiovascular exercise (Dzierzewski et al., 2014; Passos, Poyares, Santana, Tufik, & Tulio de Mello, 2012; Reid et al., 2010). Cuellar et al. (2007) support the use of music and tai chi chih in older adults for managing insomnia.

Shergis et al. (2016) find benefits of acupuncture over placebo for improving insomnia.

Mind-body modalities, including hypnosis, yoga, tai chi chih, mindfulness meditation, and relaxation techniques (Kozasa et al., 2010; Pearson et al., 2006) decrease the arousal of the brain, activating the parasympathetic nervous system, which supports rest and relaxation by decreasing the pulse and blood pressure (Bonnet & Arand, 2010). According to Barrows and Jacobs (2002), many mind-body interventions are as effective as conventional treatments, e.g. pharmaceuticals, for insomnia and anxiety, since they act on the root cause by decreasing the activity of the sympathetic nervous system. Morin et al. (2003) also suggest that insomnia management requires effective stress management, since effective coping skills can mediate insomnia. An expansion in the conventional treatment of insomnia could reframe the problem of insomnia and encourage self-healing with less reliance on sleep medications (Naiman, 2015).

Naiman (2015) describes integrative medicine not as an alternative, but as an enhancement to conventional care. Yet, according to the National Health Interview Survey in 2002, 4.5% of those living with insomnia use CIT based therapies for sleep (National Center for Complementary and Integrative Health [NCCIH], 2015; Pearson et al., 2006). This number appears low in comparison to the research that is currently available regarding benefits of CIT for chronic insomnia sufferers. Despite the evidence in favor of CIT benefits for individuals with insomnia, relatively few patients have used these interventions.

Family practice physicians are often primary point-of-care providers for treatment of chronic medical issues, and function under burdensome time constraints, often managing multiple issues during each patient contact (Benca, 2005). Primary providers may not adequately address insomnia due to the lack of time in patient contact, and often not until the quality of life

(QOL) is significantly affected by lack of sleep (Benca, 2005; Saddichha, 2010; Shahid et al., 2012). However, there is strong evidence that healthcare providers (HCPs) are interested in using CIT, but lack knowledge and resources to do so (Bjerså, Stener Victorin, & Fagevik Olsén, 2012; Mildren & Stokols, 2004; Münstedt, Harren, von Georgi, & Hackethal, 2011). Next, we consider tools for linking the information about CIT to the care of individuals with insomnia.

Klimenko, Juilliard, Lu, and Song (2006) randomly survey 398 HCPs to investigate essential factors needed for a joint approach for integrative healthcare and find that communication is critical to integration. However, we did not identify any educational artifacts or tools directed at HCPs that address evidence-based research for CIT use in insomnia. Smith, Clavarino, Long, and Steadman (2015), in a survey of 17 HCPs, determine that a brochure is an effective tool for informing HCPs and patients in the oncology setting about CIT. Thus, development of an educational artifact could be a viable tool for HCPs, to provide information and support communication regarding CIT for management of insomnia. In order to raise the awareness of effective CIT for the management of insomnia associated with chronic diseases, we seek to collaborate with HCPs to create a tool for communicating information about CIT. Therefore, our research purpose is to co-create with HCPs an educational artifact that helps HCPs inform their chronically ill patients about evidence-based CIT for insomnia management.

In this research project, we first review the literature surrounding insomnia including the context, current treatments, and effective CIT modalities for insomnia in chronic disease. We also discuss and frame our research lenses and methodology. Lastly, we provide the results of our research and discuss the findings, our interpretations, and implications of the research.

Literature Review

The purpose of this chapter is to review the relevant literature and evidence-based studies regarding our research purpose: to co-create with healthcare providers (HCPs) an educational artifact that helps them inform their chronically ill patients about evidence-based complementary and integrative therapies (CIT) for insomnia management. We begin by examining the context of insomnia, its connection to stress and the relationship between insomnia, stress, and chronic disease conditions. Next, we explore insomnia and chronic conditions with a focus on three chronic conditions: mental health, pain, and cancer due to their connected research and relationship with chronic insomnia. Then, we discuss the current conventional treatments for insomnia including prescription pharmacological agents, cognitive behavioral therapy for insomnia (CBT-I), and relaxation training with sleep hygiene (refer to Appendix A for definition). Finally, we review the perspectives on using CIT, including the modalities of CIT for insomnia and effective processes for educating practitioners' patient populations about CIT.

Context of Insomnia

The physiology of sleep consists of two stages: non-rapid eye movement (non-REM) sleep (refer to Appendix A for definition) and rapid eye movement (REM) sleep (refer to Appendix A for definition) (Anderson & Bradley, 2013). The restorative functions of sleep occur in stage N3 sleep (refer to Appendix A for definition), which is a sub-state of NREM, and in REM sleep, which is associated with dreaming. The N3 sleep stage is imperative for physical repair of the body and REM is essential for memory formation, cognition, and cellular proliferation (Edge, 2010). If restorative sleep (refer to Appendix A for definition) is deficient, there is a progression of daytime symptoms, including mental foggiess, decreased energy, and

fatigue (Anderson & Bradley, 2013; Edge, 2010).

Insomnia frequently occurs with an extensive list of physical, emotional, and situational circumstances (Benca, 2005; Schutte-Rodin et al., 2008). Chronic insomnia results when sleep is interrupted at least three times weekly for a minimum of one month (Berger, 2009; Schutte-Rodin et al., 2008). Some of the most frequently cited factors contributing to chronic insomnia are stress, anxiety, depression, and pain (Hall et al., 2007; Morin et al., 2003; Riemann et al., 2010).

Medical or psychosocial stressors can contribute to insomnia by initiating a hyperarousal cascade of symptoms (Bonnet & Arand, 2010; Riemann et al., 2010). The hyperarousal model of insomnia relates the acute stressor to the over-activation of the sympathetic branch of the central nervous system (CNS) (Bonnet & Arand, 2010; Riemann et al., 2010). When there is hyperarousal activation repeatedly, it perpetuates a pathway of learned impaired sleep behavior (Riemann et al., 2010).

Activation of the arousal centers in the brain leads to the circulation of corticotrophin-releasing hormone (CRH). CRH increases sympathetic nervous system (SNS) activation, which increases the heart rate, cortisol secretion, and activity in the emotional brain centers (Morin et al., 2003; Sapolsky, 2004). Suchecki, Tiba, and Machado (2012) confirm the link between chronic stress and sleep quality (refer to Appendix A for definition) due to dysregulation of the SNS, validating that chronic stress disrupts sleep and initiates stress-related sleep disorders including chronic insomnia. Due to the bi-directional relationship between insomnia and stress, Morin et al. (2003) conclude that to manage insomnia, one must also address the associated symptoms of stress. The parasympathetic nervous system (PNS) supports the ability to engage in

healthier restorative sleep by allowing the rest and relaxation response to override the SNS activity (Sapolsky, 2004). Interventions that manage psychological stress and improve stress-related coping skills may play a significant role in managing chronic insomnia by engaging the PNS (Bonnet & Arand, 2010; Hall et al., 2007; Morin et al., 2003). Understanding the scope of insomnia and its relationship to chronic disease is another important factor for improving the processes for insomnia management (Hall et al., 2007).

Insomnia and Chronic Conditions

Historically, insomnia was a symptom associated with a comorbidity rather than as a primary diagnosis (Berger, 2009; Langford, Lee, & Miaskowski, 2012; Roth, 2009). Within the past 10-20 years, research has focused on addressing insomnia as a primary health disorder (Berger, 2009; Langford et al., 2012). In a 1982 epidemiologic study of 9,000 adult participants age 65 and older, Foley et al. (1995) suggest that insomnia often occurs in conjunction with chronic diseases. The researchers confirm previous associations of sleep disturbances (refer to Appendix A for definition) co-existing with chronic diseases and behavior in a large and heterogeneous population of elderly adults, demonstrating the correlations of insomnia to depression, to respiratory disease, to over-the-counter medication use, and to physical impairments (Foley et al., 1995).

The Behavioral Risk Factor Surveillance System Survey of 2009 asked over 250,000 U.S. respondents about their sleep for one month and the presence of associated chronic conditions (Liu et al., 2013). The survey results confirm the correlation between some of the most common chronic conditions (including diabetes, arthritis, heart disease, obesity, stroke, and high blood pressure) and sleep deficiencies (Liu et al., 2013). Benca (2005) notes that chronic

insomnia, especially interruptions in sleep maintenance (refer to Appendix A for definition), is more prevalent amongst the elderly and individuals with chronic conditions, especially depression and chronic pain. Not only is the connection between insomnia and chronic illnesses well delineated in the literature, but also there is evidentiary support that insomnia exacerbates the symptomatic effect of chronic conditions and complicates disease management (Anderson & Bradley, 2013; Benca, 2005; Foley et al., 1995; Foley et al., 2004; Katz & McHorney, 2002; Liu et al., 2013; Pearson et al., 2006).

Additional studies look at how insomnia affects the QOL of individuals. In a cross-sectional analysis of 3,445 outpatients with one or more chronic disease, 50% of the participants experience mild to moderate insomnia (Katz & McHorney, 2002). Individuals with severe insomnia demonstrate a further decline of physical functioning congruent with the physical decline relative to participants (without insomnia) with congestive heart failure (Katz & McHorney, 2002). Katz and McHorney (2002) conclude that the management of insomnia, especially in conjunction with chronic diseases, is needed to improve QOL.

Insomnia and stress affect the occurrence and management of chronic conditions (Katz & McHorney, 2002; Liu et al., 2013; Pearson et al., 2006). In the next section, we examine the research of three selected chronic conditions—mental health, pain, and cancer—in relation to insomnia. We selected these specific conditions because of the extensive research devoted to studying these chronic diseases and the detrimental impact of insomnia on these patient populations (Benca & Peterson, 2008; Berger, 2009; Dean et al., 2013; Edge, 2010; Enderlin et al., 2011; Foley et al., 2004; Hamera, Brown, & Goetz, 2013; Hardy, 2008; Kallestad et al., 2012; Langford et al., 2012; Liu et al., 2013; Motivala, Levin, Oxman, & Irwin, 2006a; Roth,

2009; Stiefel & Stagno, 2004).

According to The National Institute of Mental Health (NIMH) (2014), 18.2% of the United States (US) general population over the age of 18 has a diagnosed mental health condition. Furthermore, chronic pain affects 11.2% of the adult population (NIH, 2015) and cancer affects about 28% of the population (National Cancer Institute [NCI], 2016). Although mental health diagnoses, pain, and cancer affect a sizable portion of the general population, these three conditions represent only a sample of the many interrelationships of particular disease states and insomnia and as many as 80% of individuals with chronic diseases experience insomnia (Miller, 2009; Woodward, 2011).

Mental health. The impact of sleep disorders on mental health is immense (Benca, 2005; Miller, 2009). Nearly 20 mental health diagnoses in the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition-Text Revision (DSM-IV-TR) list insomnia as a symptom of the disease (Kallestad et al., 2012). Psychiatric disorders potentiate the occurrence of insomnia, affecting up to 40-80% of mental health patients, as compared to 10-15% in the general population (Anderson & Bradley, 2013; Benca, 2005; Hamera et al., 2013; Kallestad et al., 2012). In a cross-sectional study of over 2,000 mental health outpatients, Kallestad et al. (2012) report that increased sleep dysfunction may diminish the treatment benefit of mental health disorders. Motivala et al. (2006a) also find similar results in a separate cross-sectional study of three urban communities. Both studies highlight the importance of treating insomnia to improve functioning and wellness in mental health clients.

Depression, a common mental health condition associated with insomnia, embodies the challenges of managing insomnia in mental health patients (Anderson & Bradley, 2013; Hamera

et al., 2013; Motivala et al., 2006a). Anderson and Bradley (2013), Hamera et al. (2013), and Motivala et al. (2006a) found that individuals with depression experience more sleep impairments and require quality assessments for sleep disorders from HCPs, since insomnia reduces the successful response rates for treatment of depression. Some of the pharmaceuticals for managing depression may also negatively affect sleep architecture (refer to Appendix A for definition), leading to sustained insomnia after the depression has improved and potential for relapse of the depression (Benca & Peterson, 2008; Edge, 2010; Hardy, 2008). Depression itself also causes changes in sleep architecture, including decreased slow wave sleep (refer to Appendix A for definition) and REM disturbances (refer to Appendix A for definition), which have important restorative sleep functions for healthy cognition and brain function (Anderson & Bradley, 2013; Edge, 2010).

Given the clear link between mental illness and the consequences of chronic disease, in particular depression and insomnia, HCPs need to be aware of and address insomnia (Benca, 2005; Hardy, 2008; Kallestad et al., 2012; Miller, 2009; Motivala et al., 2006a). Depression and insomnia perpetuate other complex health management issues including an increase in blood cortisol levels (Edge, 2010). Cortisol release increases the susceptibility to weight gain, metabolic dysfunction, and endocrine abnormalities, which may all be precursors for a litany of other chronic conditions (Anderson & Bradley, 2013; Benca & Peterson, 2008; Edge, 2010; Hamera et al., 2013; Hardy, 2008; Motivala et al., 2006a). Untreated chronic insomnia associated with depression can lead to multiple serious chronic diseases, e.g., diabetes, hypertension, and obesity (Hamera et al., 2013). Pain is another chronic condition with detrimental effects related to insomnia. The following is a discussion of the literature surrounding the connections between

insomnia and pain.

Pain. Stiefel and Stagno (2004) estimate that over 50 million Americans experience some degree of chronic pain and 70% of these individuals experience sleep disturbances as a result of their pain. Insomnia and pain have a bi-directional effect since insomnia elevates pain perception (Lundeberg & Lund, 2007; Stiefel & Stagno, 2004). Lundeberg and Lund (2007) confirm the close relationship between insomnia and pain perception by looking at fibromyalgia-related pain and insomnia. Results confirm that sleep deprivation heightens the sensitivity of pain perception (Lundeberg & Lund, 2007). Another concern relates to the side effects from the use of opioids by HCPs for pain management, including increase of next-day sedation and fatigue, which may perpetuate sleep disruption (Dimsdale, Norman, DeJardin, & Wallace, 2007).

Opioids are the primary medication for acute and chronic pain, but few studies evaluate how opioids affect sleep architecture (Dimsdale et al., 2007). Recognizing the changes in sleep is difficult due to the complexity of variables for opioid use and the issues relating to tolerance and addiction. Dimsdale et al. (2007) look primarily at younger adults to determine if opioids (morphine and methadone) affect the architecture, quantity, and quality of sleep in healthy, pain-free individuals. The results demonstrate that opioid use decreases the time in REM and the deep restorative cycles of sleep (refer to Appendix A for definition) by 30-50%, resulting in sedation, fatigue, and dizziness. In addition, there is the potential for other drug interactions when factoring in the complexity of multi-drug use in the management of chronic conditions (Dimsdale et al., 2007; Stiefel & Stagno, 2004). Thus, there are multiple pathways of causation between chronic diseases and insomnia since both pharmaceuticals prescribed for pain and the chronic condition of pain itself affect healthy sleep patterns (Dimsdale et al., 2007; Stiefel &

Stagno, 2004).

Addressing non-pharmacological approaches as alternative options for insomnia management is needed when chronic pain is present (McCracken, Williams, & Tang, 2011; Naiman, 2015). Bohra and Espie (2013) reviewed studies looking at CBT-I for insomnia as a result of chronic pain and assert that although CBT-I works as a treatment for insomnia, it does not improve the perception of pain. McCracken et al. (2011) observe that CBT-I is an effective treatment for individuals with chronic pain and insomnia when including modifications of psychological restructuring, mindfulness training, and pain acceptance interventions. In the next section, we review the prevalence of insomnia in the cancer population.

Cancer. The prevalence of insomnia in the cancer population is about twice the general population (Langford et al., 2011; Matthews et al., 2014; Woodward, 2011). Langford et al. (2011) report that 30-50% of individuals with cancer experience some degree of sleep disturbances and Woodward (2011) states that insomnia may affect up to 88% of people with cancer. Cancer physiology, the disease symptomatology, the psychological trauma, and treatment side effects all play into sleep disturbances in the oncology population (Berger, 2009).

Sleep disturbances are one of the more distressing symptoms associated with a cancer diagnosis (Berger, 2009). Sleep-wake disturbances have the potential to affect all phases of the cancer journey, from diagnosis through post-treatment follow-up and long-term survivorship. Untreated insomnia increases the risk of developing and/or exacerbating other chronic physical and psychological conditions such as stress, anxiety, depression, and pain (Enderlin et al., 2011). Adults with cancer also have many problematic symptoms during treatment (including pain, nausea and fatigue) that are worsened by insomnia (Berger, 2009), resulting in a significant

decline in QOL for the patient (Enderlin et al., 2011).

In summary, researchers suggest that insomnia poses a medical management challenge for those suffering from mental health conditions, pain, and cancer diagnoses (Berger, 2009; Kallestad et al., 2012; Motivala et al., 2006a; Stiefel and Stagno, 2004), and primary care physicians are not well trained in sleep interventions and rarely address insomnia when associated with other chronic conditions (Benca, 2005; Sorscher, 2008). Chronic illnesses pose unique challenges for HCPs in managing long-term insomnia, particularly with pharmaceuticals, which may precipitate side effects and medication interactions (Benca, 2005; Berger, 2009; Schutte-Rodin et al., 2008). Next, we examine the current conventional treatments for insomnia including prescription and over-the-counter (OTC) pharmacological agents, CBT-I, and relaxation training and sleep hygiene.

Current Conventional Treatments for Insomnia

The current medical interventions for insomnia include pharmacologic agents (benzodiazepines, non-benzodiazepine hypnotics, antihistamines, melatonin, and antidepressants), CBT-I, and relaxation training and sleep hygiene (Benca, 2005; Saddichha, 2010; Schutte-Rodin et al., 2008; Shahid et al., 2012). Due to inconsistent standards for insomnia management, HCPs frequently prescribe pharmacologic agents despite well-documented limitations of long-term use and side effects (Benca, 2005; Schutte-Rodin et al., 2008). HCPs face many challenges with insomnia management, one of which is the ability to find the most effective and safe treatment for the client without adding the burden of side effects and drug interactions that are prevalent with the most commonly used treatment, the sedative-hypnotics (benzodiazepines and non-benzodiazepines) (Benca, 2005; Saddichha, 2010; Schutte-Rodin et

al., 2008). Below, we review the literature on the benefits and limitations of prescription pharmacological agents, OTC medications, CBT-I, and relaxation training and sleep hygiene treatments for insomnia.

Prescription pharmacological agents. Benzodiazepines are frequently prescribed for insomnia due to their sedative and anti-anxiety effects which enhance sleep onset and total sleep time (TST) (refer to Appendix A for definition) (Benca, 2005; Saddichha, 2010). Due to the long half-life present in several benzodiazepines, their use is not recommended in elderly patients due to cognitive effects and potential for falls (Saddichha, 2010). The side effect profile of benzodiazepines is substantial and includes rebound insomnia (refer to Appendix A for definition), memory loss, withdrawal effects, next-day drowsiness, addiction, and tolerance (or diminished response to the drug) (Benca, 2005; Saddichha, 2010). Saddichha (2010) recommends low doses and short term use for insomnia (no more than one month) due to dependence and discontinuation symptoms. Takaesu et al. (2014) concur that long-term use of benzodiazepines has limited effectiveness due to their propensity for tolerance and habituation (or psychological addiction).

Due to the negative consequences of long-term use of benzodiazepines, the non-benzodiazepines are now more commonly used for insomnia (Benca, 2005; Schutte-Rodin et al., 2008; Shahid et al., 2012). The non-benzodiazepines have an improved safety profile, including less next-day sedation (Schutte-Rodin et al., 2008). HCPs currently prescribe non-benzodiazepines more than any other sleep medications due to their improved efficacy in sleep onset and TST (Benca, 2005; Saddichha, 2010). Benca (2005) and Saddichha (2010) note that the newer non-benzodiazepine hypnotics (zolpidem, eszopiclone, and zaleplon) are more

efficacious than benzodiazepines for short-term sleep management (refer to Appendix A for definition) and are less sedating the following day. Limitations for benzodiazepine and non-benzodiazepine hypnotics are the tolerance and addiction that may develop, which consequently remain significant barriers to long-term use of both medications (Benca, 2005; Takaesu et al., 2014; Vyas, 2013).

Adverse effects are particularly critical for the older population due to “hangover” effects from the use of hypnotics. This term refers to side effects that persist into the next day and include daytime drowsiness, motor impairment, and mental sluggishness (Benca, 2005; Saddichha, 2010). In a retrospective case-control study, the subjects using zolpidem (all over 65 years of age) were twice as likely to sustain a hip fracture as compared to non-users of zolpidem (Benca, 2005). This study leads to questions of safety in zolpidem and other hypnotics with longer half-lives and the potential for next-day impairments.

Few trials evaluate the use of benzodiazepines and non-benzodiazepines beyond 12 weeks of use (with the exception of eszopiclone); therefore, there are unclear guidelines for long-term use in insomnia (Benca, 2005; Shahid et al., 2012). Currently, there is evidence that long-term use of sedative-hypnotics is frequent in populations that respond poorly to treatment, requiring increasing doses for effective treatment (Takaesu et al., 2014). There has not been adequate guidance from the Food and Drug Administration (FDA) regarding appropriate prescribing practices of benzodiazepines and non-benzodiazepines, which complicates prescribers’ decisions for safe and effective care for chronic insomnia (Benca, 2005; Takaesu et al., 2014). There is concern within the medical community about the long-term use of hypnotics due to the potential for safety concerns and side effects (Benca, 2005; Schutte-Rodin et al., 2008;

Shahid et al., 2012; Takaesu et al., 2014).

Sedating antidepressants have an off-label use, which means administration for chronic insomnia has not been approved by the FDA (Benca, 2005; Schutte-Rodin et al., 2008). These antidepressants serve a dual purpose in the clinical care of a client with depression and offer second-line choices for insomnia after the failure of hypnotics (Hardy, 2008; Schutte-Rodin et al., 2008). The antidepressants amitriptyline and trazodone may be beneficial for insomnia, but also have limiting side effects to consider, such as hypotension, oversedation, and rebound insomnia (Benca, 2005; Hardy, 2008; Saddichha, 2010). HCPs prescribe trazodone nearly as often as zolpidem (a hypnotic) even without FDA approval for insomnia (Benca, 2005; Saddichha, 2010). Advantages of trazodone include its relatively low cost, an acceptable long-term use profile for depression, and lack of abuse; however, there are many side effects including an abnormal drop in blood pressure, nausea, vomiting, and cardiotoxicity (Benca, 2005).

Hardy (2008) finds successful use for amitriptyline for insomnia comorbid with depression, but also states that prescribers must engage with caution when using amitriptyline in individuals with chronic diseases due to the potential for cardiotoxicity, sedation, and a higher risk in overdose toxicity (Hardy, 2008). Benca (2005) and Saddichha (2010) observe neither minimal evidence-based safety profile nor FDA approval for long-term use of these off-label prescriptions for insomnia. Another option for insomnia management is the use of OTC medications. In this next section, we review a common sleep aid—diphenhydramine—and supplements for insomnia.

Over-the-counter (OTC) medications. Diphenhydramine (Benadryl) is an antihistamine medication that is a low-cost, short-term and frequent option for insomnia (Benca, 2005). The

general population regards diphenhydramine as a safe alternative to prescription medications since it is available without a prescription (Benca, 2005). However, placebo-controlled studies of diphenhydramine that evaluates usage beyond a three-week period shows an increased risk for dementia (Wong, 2015). The side effects of diphenhydramine include impaired cognitive function, urinary retention, low blood pressure, impaired motor skills, next-day drowsiness, tolerance, and restless legs syndrome (RLS) (AASM, 2006; Benca, 2005; Saddichha, 2010; Schutte-Rodin et al., 2008). The preceding effects are dangerous and limit the suitability of this drug for those with chronic diseases due to the potential for interactions with medications used for comorbid conditions and the potential for toxicity (Benca, 2005; Schutte-Rodin et al., 2008; Saddichha, 2010).

Melatonin supplements are a synthetic form of the naturally occurring endogenous hormone and a mainstream therapeutic option for insomnia (Arendt, Van Someren, Appleton, Skene, & Akerstedt, 2008; Braam, Didden, Smits, & Curfs, 2008; Ferracioli-Oda, Qawasmi, & Bloch, 2013; Gooneratne, 2008). Braam et al. (2008) noted improvements in SL and TST in a randomized placebo-control trial with intellectually delayed individuals using melatonin for sleep. Ferracioli-Oda et al.(2013) examined melatonin in 19 RCTs in a meta-analysis and reported modest improvements in SL, an increase in TST, and improvement in sleep quality in comparison to placebo.

Melatonin has minimal side effects when compared to standard pharmaceuticals and there is no concern for dependence. Melatonin may cause some next-day drowsiness (Gooneratne, 2008). Braam et al. (2008) and Gooneratne (2008) find melatonin is safe in many populations, including those with mental health diagnoses. The timing of the dose is critical for

optimal performance and patients should administer this medication an hour before sleep with low light exposure following dosing (Braam et al., 2008). Melatonin is a less effective treatment when compared to benzodiazepine and non-benzodiazepine pharmacological agents (Ferracioli-Oda et al., 2013). Saddichha (2009) considers melatonin to be a second-line medication for insomnia, and needs more evaluation before it meets standards of care for insomnia management.

In addition to melatonin, L-tryptophan is a nutraceutical that has engaged the interest of both researchers and the general public as an option for treating insomnia. Merriam-Webster defines a nutraceutical as a functional food that provides health benefits (Nutraceutical, n.d., para. 1). L-tryptophan is a primary amino acid found in cheeses, eggs, and poultry, and is a precursor to serotonin. L-tryptophan may shorten SL and increase slow wave sleep (Thorne Research Inc., 2006). However, in a recent review of 3 RCTs by Yurcheshen, Seehuus, and Pigeon (2015), L-tryptophan is comparable to the placebo effect when evaluating sleep improvement. After the first two weeks of follow-up, the researchers do not address sleep patterns, so it is unclear if continued use may improve response. These studies included both diet-sourced L-tryptophan and supplements (Yurcheshen, Seehuus, & Pigeon, 2015). There is also concern that L-tryptophan may interact and potentiate the effects of hypnotics and serotonin-based antidepressants (Yurcheshen et al., 2015).

Using pharmacologics for the management of chronic symptoms of insomnia in those with other chronic conditions is especially complicated. Polypharmacy that includes benzodiazepines, non-benzodiazepines and sedating antidepressants lends itself to drug interactions (Benca, 2005; Hardy, 2008; Miller, 2009). Side effects for OTC medications

including diphenhydramine are considerable and safety is limited to short-term use (Benca, 2005). Melatonin and herbs such as L-tryptophan have limited effectiveness (Saddichha, 2010; Yurcheshen et al., 2015). Therefore, interventions that include non-pharmacological and integrative approaches for the management of insomnia can aid in effective treatment without causing harm for individuals with chronic disease.

Cognitive behavioral therapy for insomnia (CBT-I). Over the last twenty years, evidence from RCTs demonstrates that CBT-I is widely accepted as the most successful non-pharmacologic intervention for insomnia and consists of a cognitive and a behavioral component (Benca, 2005; Berger, 2009; Kwekkeboom, Abbott-Anderson, & Wanta, 2010; Matthews et al., 2014; Woodward, 2011). CBT-I attempts to undo negative learned thoughts and behaviors associated with sleep (Benca, 2005; Berger, 2009; Kwekkeboom et al., 2010; Matthews et al., 2014; Woodward, 2011). The initial step is to determine the factors and causation of insomnia by assisting the client in identifying maladaptive attitudes and facilitating changes that block sleep. Other components include stimulus control, sleep hygiene, and relaxation training (Benca, 2005; Mayo Clinic, 2016; Saddichha, 2010). CBT-I is effective for long-term maintenance of sleep and it has virtually no side effects (Benca, 2005; Miller, 2009; Vyas, 2013).

In a meta-analysis, Morin, Culbert, and Schwartz (1994) suggest that using CBT-I for insomnia sustains an effective response in at least 70% of participants at the six-month follow-up. Saddichha (2010) also finds strong evidence that CBT-I decreases SL and improves TST. Benca (2005) concurs that the efficacy of CBT-I for chronic insomnia is a superior option alone or in combination with pharmacologic therapy, rather than just pharmaceuticals alone. Benca (2005) and Vyas (2013) agree that practitioners should treat all chronic insomnia patients with

behavioral treatments, including CBT-I, for long term effectiveness.

CBT-I is also successful in the treatment of insomnia in breast cancer survivors (Matthews et al., 2014). Matthews et al. (2014) found that breast cancer survivors who received CBT-I had an improvement in SL and sleep efficiency (SE) (refer to Appendix A for definition), which continued through their three and six-month follow-up visits. The Oncology Nursing Society states that CBT-I is an effective evidence-based care standard for insomnia in cancer patients (Woodward, 2011).

Although there is evidence that CBT-I is an effective intervention for chronic insomnia, one of the barriers for success includes insufficient numbers of trained therapists capable of implementing CBT-I (Ellis et al., 2015). Ellis et al. (2015) also indicate problematic issues with compliance and non-adherence to the established protocol, limiting the success rate in specific clients. CBT-I is a costly and time-intensive intervention, and access is limited to regions where therapists are available (Anderson, Goldsmith, & Gardiner, 2014; Ellis et al., 2015; Shahid et al., 2012; Vyas, 2013). HCPs are often unaware of referral sources for CBT-I due to a shortage of accessible CBT-I therapists (Benca, 2005; Hardy 2008). Alternatives to personal CBT-I training are internet based CBT-I programs, group therapy for insomnia, telehealth, and home-based programs, all of which are innovative but require more research to determine effectiveness (Anderson et al., 2014; Ellis et al., 2015). Behaviorally-based interventions positively impact insomnia, are sustainable, and are safer than pharmacology, but are not without limitations to their use and effectiveness (Benca, 2005; Saddichha, 2010). Another intervention for addressing insomnia is relaxation training and sleep hygiene. Next, we discuss the strengths and limitations of relaxation training and sleep hygiene.

Relaxation training and sleep hygiene. The American Psychological Association (APA) and the AASM support relaxation training and stimulus control (a set of instructions to re-establish the bedroom with sleeping) as standard treatments for chronic insomnia (Benca, 2005; Vyas, 2013). However, the APA and the AASM do not support sleep hygiene alone (regular sleep times, bedtime routines, avoidance of caffeine and computer screens before bedtime) as useful for managing insomnia (Schutte-Rodin et al., 2008; Vyas, 2013). Although sleep hygiene is not a standard of care, it remains an important part of most behavioral treatments for insomnia (Benca, 2005; Schutte-Rodin et al., 2008). A key consideration for the recommendation of relaxation training and sleep hygiene is to use it in conjunction with CBT-I for more beneficial results (Benca, 2005).

Strengths of relaxation training and sleep hygiene are that they are accessible at home, cost-effective, and have minimal, if any, side effects (Pallesen et al., 2003; Waters et al., 2003). Relaxation training and sleep hygiene used jointly demonstrate improvements in WASO and SL (Morin et al., 1994); however, sleep hygiene independent of relaxation training lacked effectiveness in any outcome measurements. The limitations for relaxation training and sleep hygiene include compliance issues, lack of motivation due to inconsistent techniques, and lack of perceived effectiveness, possibly due to the need for regular practice (Benca, 2005; Saddichha, 2010). The behavioral therapies (CBT-I, relaxation training, stimulus control and sleep hygiene) leave critical gaps in the availability of affordable, accessible, and successful management for chronic insomnia (Benca, 2005).

We found several evidence-based articles using behavioral approaches concurrently with CIT for insomnia management. Laguna-Parras, Jerez-Rojas, García-Fernández, Carrasco-

Rodríguez, and Nogales-Vargas-Machuca (2013) demonstrate improvement in sleep outcomes of 291 hospitalized mental health inpatients using a quasi-experimental design. When implementing autogenic muscle relaxation, massage, and sleep hygiene, participants' sleep measurements significantly improve by discharge. In the second article, Saddichha (2010) suggests an algorithm for treatment of insomnia, consisting of initial treatment with either CBT-I alone or in combination with relaxation therapy; if there is no improvement in symptoms, then consider a trial of a different modality. If there is still no improvement, Saddichha (2010) finds the strongest evidence for the use of short-term pharmacology agents along with CBT-I for treatment of insomnia.

Thus far, we have examined the current literature on conventional management for insomnia associated with chronic conditions. Although pharmacologic management provides effective short-term relief, the results of research studies make it clear that this is often not the ideal option for long-term management of insomnia (Benca, 2005; Saddichha, 2010; Schutte-Rodin et al., 2008). Non-pharmacological management does provide long-term improvement of insomnia without the significant side effect profile of benzodiazepines, non-benzodiazepines and sedating antidepressants (Benca, 2005; Saddichha, 2010; Vyas, 2013). Sleep hygiene practices are not very productive unless combined with another therapy (Benca, 2005; Schutte-Rodin et al., 2008). CBT-I is effective but not accessible, and HCPs are often unaware of referral sources for CBT-I therapists. Lastly, HCPs are not fully aware of effective non-pharmacological approaches to insomnia management (Benca, 2005; Hardy 2008; Saddichha, 2010).

A large population of people (approximately 1.6 million) use CIT due to difficulty with sleeping and insomnia (Pearson et al., 2006) since many people express a wish to avoid side

effects of conventional medications and prefer a more mind-body approach according to the NCCIH (Gooneratne, 2008; NCCIH, 2015; Pearson et al., 2006). Next, we review the research results of the benefits and limitations of the use of CIT for insomnia. We found scholarly research articles on insomnia and the following integrative practices: herbs, aromatherapy, acupuncture, energy healing, music, mindfulness meditation, hypnosis, massage therapy, movement, relaxation and breathing techniques, and yoga.

Perspectives on CIT

CIT is gaining visibility and becoming more mainstream among patients and practitioners in allopathic healthcare (Bjerså et al., 2012; Milden & Stokols, 2004). In a survey by the American Association of Retired Persons [AARP]/National Center for Complementary and Alternative Medicine [NCCAM], 54% of respondents over age 50 are using a form of CIT (AARP & NCCAM, 2007). However, in a survey of 36,000 households only 4.5% of respondents used CIT specifically for insomnia (Gooneratne, 2008; Pearson et al., 2006). Information about integrating CIT into mainstream medicine remains a significant barrier to practice for physicians (Klimenko et al., 2006; Milden & Stokols, 2004; Münstedt et al., 2011). Eighty-one percent of a random sample of California physicians would like more education about CIT, and 61% are unsure of safety profiles and efficacy for targeted health maintenance concerns (Milden & Stokols, 2004). These results mirror a similar study in Ireland in which researchers survey 156 HCPs regarding their understanding of CIT (Chang, Brodie, Choong, Sweeney & Kerin, 2011). The HCPs respond that they lack sufficient knowledge about CIT (58.8%), and were not aware of the most current evidence-based CIT recommendations in cancer (79.2%) (Chang et al., 2011). These percentages are congruent with a third study in Germany by

Münstedt et al. (2011) of 219 HCPs, who consider their knowledge as deficient in nearly all CIT (73.8%). Additionally, the HCPs respond that they did not feel they could adequately advise their patients on CIT.

In a recent study evaluating the general population's interest in CIT, the AARP and NCCAM (2015) find that approximately one-third of patients (31%) pursuing CIT discuss use with their physician; however, only 12% of CIT users receive information and guidance from a doctor. McEachrane-Gross, Liebschutz and Berlowitz (2006) survey US veterans and find that 27% of the veterans report use of six common CIT treatments within their clinic and/or outside their clinic system during the last 12 months. An overwhelming majority of the survey respondents (89%) receive CIT information from their primary physician. The respondents' use of the six CIT (dietary supplements, massage therapy, chiropractic care, herbs, acupuncture, and homeopathy) is lower than in the US population but still significant in number. Approximately three-quarters of the non-CIT users would consider CIT if a HCP offered it to them in the VA healthcare system (McEachrane-Gross, et al. 2006). Next, we review the current literature on CIT for the management of insomnia.

CIT Modalities for Insomnia

Researchers suggest that CIT has some efficacy for the management of chronic insomnia, including the following modalities: herbs, aromatherapy, energy healing, acupuncture, mindfulness meditation, hypnosis, and yoga (Cuellar et al., 2007; Gooneratne, 2008; Kozasa et al., 2010; Lillehei & Halcon, 2014; Long, Huntley, & Ernst, 2001; Sarris & Byrne, 2011). We include more detail about each of these CIT plus music, massage therapy, movement, and relaxation and breathing techniques in the following sections.

Herbs. Herbal medicine has become a popular modality for addressing insomnia (Taslaman, 2014). Valerian (*Valerian officinalis*), hops (*Humulus lupulus*), German chamomile (*Chamomilla recutita*), and passionflower (*Passiflora incarnata*) are herbs that have shown the most promise in academic empirical research (Ngan & Conduit, 2011; Taslaman, 2014).

Ngan and Conduit (2011), using a sleep diary, found improvements in subjective sleep quality with passionflower tea. The study included 41 participants with mild insomnia in a double-blind crossover format to minimize bias and placebo effect. Polysomnography (refer to Appendix A for definition) reveals no difference between the passionflower tea and placebo group, but drinking passionflower tea on a daily basis produced comprehensive short-term subjective sleep benefits.

Taslaman (2014) reviewed the results of nine placebo-based RCTs on valerian, valerian-hops combination, German chamomile, and passionflower. In four of the five studies on valerian alone, the results did not support a statistically significant objective or subjective response for improvement of sleep to support the use of valerian exclusively. However, the participants results of a large RCT of 434 adults with primary insomnia disorder showed modest improvements in arousals and sleep duration using valerian. In one of two RCTs on the valerian-hops combination, the participants results did indicate statistically significant improvements in subjective sleep parameters. In the final two RCTs, researchers tried either German chamomile or passionflower on adults with insomnia. The studies warranted further research, neither of the results showed statistical significant improvement in sleep. There are numerous factors to consider that may affect the consistency of the RCTs results. There is no standard dosing or length of treatment time to best determine efficacy of the herbs; furthermore, these studies did

not control for exposure to stimulants, such as caffeine, which recipients may use during the day (Sarris, 2012; Taslaman, 2014). The placebo effect may affect the validity of some of the results suggesting further research is needed that addresses these variables.

Morin, Koetter, Bastien, Ware, and Wooten (2005) measure the responses of 184 individuals enrolled in three separate arms of a RCT, measuring a valerian-hops herbal combination, a placebo, and diphenhydramine (Benadryl) for insomnia management. The recipients of the valerian-hops herbal combination demonstrated an improved subjective response in sleep, and the recipients of the valerian-hops herbal combination with diphenhydramine showed statistically similar improvements in SE. The placebo group had smaller measurable improvement of sleep.

Baek, Nierenberg, and Kinrys (2014) review the literature on 11 herbal remedies for insomnia and anxiety. Baek et al. (2014) find valerian alleviated residual anxiety and insomnia for those also using standard medications for bipolar disorder. The most common side effect of valerian is daytime sleepiness. No drug interactions occurred during the clinical trials.

Baek et al. (2014) are the only researchers that examine the effect of herbs on insomnia and co-existing chronic conditions (anxiety). The other studies either exclude those with chronic diseases (Taslaman, 2014; Morin et al., 2005) or include young, healthy adults with mild insomnia (Ngan & Conduit, 2011). Therefore, it is hard to generalize these results to the diverse population affected by chronic sleep disorders. Research results do not offer enough compelling data to either support or refute the benefits of herbal therapy; however, there is some evidence that a valerian-hops combination may provide a reasonable complementary option for insomnia (Morin et al., 2005). As with all ingested treatments, there is also a risk of a drug interaction with

herbal therapy (Chaveles, Sakellaris, & Pyrros, 2016).

Chaveles et al. (2016) establish that HCPs administering herbs to patients with cardiovascular diseases may experience clinically significant effects on the efficacy of their many cardiovascular medications. There is no standardized approach of determining the potential for multi-drug interactions. Warfarin, for example, is a frequently prescribed blood thinner, in which the efficacy is affected in patients who used herbs such as ginseng, St. John's wort, and garlic (Chaveles et al., 2016).

Aromatherapy. According to the National Association for Holistic Aromatherapy (NAHA) (2016), "Aromatherapy can be defined as the art and science of utilizing naturally extracted aromatic essences from plants to balance, harmonize, and promote the health of body, mind, and spirit" (para. 7). Aromatherapy uses volatile oils distilled from plants that affect the olfactory system. Although not well understood, the essential oils of aromatherapy interact with users on an emotional, energetic, and biochemical level (Lillehei & Halcon, 2014).

Aromatherapy is a widely available, low-cost modality that integrates easily with other mind-body interventions. Aromatherapy does not require additional practitioner visits and has few contraindications (Dyer, Cleary, McNeill, Ragsdale-Lowe, & Osland, 2016; Hajibagheri, Babaii, & Adib-Hajbagheri, 2014; Johannessen, 2013).

Hwang and Shin (2015) conducted a meta-analysis and systematic literature review of aromatherapy interventions for the improvement of sleep quality. The 13 studies definitively link aromatherapy to improvement in physical health (improved sleep and fatigue), psychological health (decreased depression, improved anxiety), and improvement in pain. The researchers find that inhalation is more effective than massage applications and the effectiveness is slightly

greater for individuals with a chronic disease than for those who report no history of chronic illness. In 12 of the studies, researchers used lavender (*Lavandula angustifolia*) either alone or in combination with other oils including wild mint (*Mentha arvensis*), sweet orange (*Citrus sinensis*), bergamot (*Citrus bergamia*), basil, (*Ocimum basilicum*), rosewood (*Aniba rosaeodora*), Roman chamomile (*Anthemis nobilis*), eucalyptus (*Eucalyptus radiata*) marjoram (*Origanum majorana*), and ylang-ylang (*Cananga odorata*). Hwang and Shin (2015) conclude that aromatherapy is economical, is accessible via inhalation or topical application, has a therapeutic benefit comparable to drug therapies in some cases, and has minimal to no contraindications.

Lillehei and Halcon (2014) also evaluate aromatherapy effects on sleep disturbances in a systematic review. They describe the inhalation of essential oils as a safe alternative to pharmaceutical interventions and the hypnotic properties of the inhaled essential oils are an effective complementary therapy for people with sleep disturbances (Lillehei & Halcon, 2014). The biochemical constituents in essential oils such as esters, acids, coumarins, and monoterpenes, generate hypnotic, anti-anxiety, and sedative effects (Lillehei & Halcon, 2014). People with sleep disturbances may use essential oils as monotherapy or in conjunction with other CIT, such as acupuncture.

Acupuncture. The ancient Traditional Chinese Medicine (TCM) practice of acupuncture unblocks energetic pathways in the body via the stimulation of specific points (meridians) with needles (Shergis et al., 2016). The meridian points for insomnia are not entirely understood, but when used skillfully with other meridian points, researchers can observe the effects in the body's biological responses (Shergis et al., 2016). Acupuncture is thought to improve sleep by

suppressing CNS activity and interacting with the pathways of gamma-aminobutyric acid (GABA) that have an inhibitory effect on the SNS (Shergis et al., 2016).

In a systematic review, Shergis et al. (2016) evaluate the effects of acupuncture to pharmacology and placebo on sleep quality on a total of 2,363 participants with insomnia. Findings indicate that acupuncture was more effective than pharmaceuticals and was also superior to placebo in terms of the Pittsburgh Sleep Quality Index (PSQI) (refer to Appendix A for definition). However, Shergis et al. (2016) recognize several limitations in most of the 30 studies in the review, including lack of blinding in the outcome assessors and lack of blinding of participants (with sham procedures). Barriers for the use of acupuncture include cost and the time commitment of appointments with a trained provider. The potential for discomfort of the needle insertion may partially contribute to its dearth of acceptance for the management of insomnia (Shergis et al., 2016).

Energy healing. Energy healing is a modality involving practitioner manipulation of energy bio-fields via direct or indirect contact (Energy Healing, n.d.). For centuries, energy healing, such as Reiki and healing touch, has been a part of nearly all global traditions of healing (Shore, 2004). Energy healing practitioners state that energy healing has a positive effect on physical and mental health and is helpful in addressing stress and emotional disorders (Shore, 2004). Reiki, a spiritual form of energy healing, and healing touch, restores balance in the body by clearing blockages within the human energy system. Energetic modalities remain promising for symptom management in stress-related disorders and depression (Shore, 2004; Wilkinson et al., 2002).

Two studies evaluating Reiki and healing touch for insomnia showed promising results

for patients suffering from depression, stress, and pain. Shore (2004) investigates long-term results of Reiki in a random control single-blinded trial of 46 adults experiencing depression and stress. Shore (2004) found a significant improvement of stress and depression ratings in the intervention groups of distance Reiki and hands-on Reiki, as opposed to the control group. The improvement in symptoms in the intervention groups persisted throughout their 12-month follow-up period. Wilkinson et al. (2002) evaluate healing touch and pain. Researchers note that the subjective responses indicate that there is more than a 50% improvement in the measurements of stress and pain (Wilkinson et al., 2002).

There are limitations for using energy healing modalities, they require an ongoing time commitment, there is the expense of clinical visits with trained specialists, and insurance rarely covers this treatment method (Shore, 2004). Reiki contraindications include: the potential to diminish anesthesia effects during surgery, and to accelerate healing before broken bone reduction (Harvard University Health Services, n.d.; Moore, n.d.; Vidal, n.d.). In addition, there is a degree of skepticism from both individuals and HCPs regarding the usefulness of energy healing as a legitimate intervention (Shore, 2004). The effectiveness of energy healing may be more beneficial for clients who are motivated and receptive to energy healing as a form of treatment (Pederson, Johannessen, Hjelmborg, & Zachariae, 2014).

Music. Music is used extensively to enhance mood and induce sleep (de Niet et al., 2009). Listening to music to improve sleep is cost-effective and accessible to anyone with a radio, compact disc CD, computer, smartphone, and/or MP3 player. In a meta-analysis, de Niet et al. (2009) looked at five RCTs from the Netherlands that examined the effects of music-assisted relaxation (MAR) on sleep quality in adults with sleep dysfunction, with or without

comorbidity. MAR improved mood, anxiety, and hormonal levels, as well as significantly improved sleep quality in the participants (mean age of 51) as compared to control groups (de Niet et al., 2009). No adverse reactions were observed. Limitations to this review include a small pool of studies, and lack of a consistent sleep diagnosis for selected studies (a sleep complaint occurring with another disease was the criteria selected) (de Niet et al., 2009). The results demonstrate that music is an accessible modality, making it a practical addition to the treatment of insomnia.

Mindfulness meditation. Kabat-Zinn and University of Massachusetts Medical Center/Worcester (1991) define mindfulness meditation as “moment-to-moment awareness” (p. 2) and is a form of meditation designed to develop the skill of paying attention to one’s inner and outer experiences with acceptance, patience, and compassion. Since 1979, Kabat-Zinn & University of Massachusetts Medical Center/Worcester (1991) has studied the use of mindfulness meditation extensively for the treatment of chronic pain and numerous other chronic diseases. Mindfulness meditation’s ability to assist the client to transcend pain and negative thinking by reframing attitudes is similar to the actions of CBT-I (Ong, Shapiro, & Manber, 2007). Mindfulness meditation is effective for chronic insomnia either as a stand-alone therapy or in combination with CBT-I (Carlson & Garland, 2005; Jain & Shapiro, 2013; Ong et al., 2014; Ong et al., 2007; Sun, Kang, Wang, & Zeng, 2013; Zhang et al., 2015). In a study combining the modalities of mindfulness meditation and CBT-I for the management of insomnia, Ong et al. (2007) found a significant improvement in sleep measures of total wake time (TWT) (refer to Appendix A for definition) and SE, as indicated in subjective sleep diaries and the pre-sleep arousal scale.

Zhang et al. (2015) evaluate the effectiveness of mindfulness-based stress reduction (MBSR) on depression and anxiety measures in 60 adults age 75 years and older in a randomized controlled single-blind trial. After the eight-week course, participants experience improvements in objective sleep measurement scores and daytime dysfunction scores. Depression scores improved significantly, yet anxiety levels remained static. Carlson and Garland (2005) observe improvements of both time and efficiency of sleep, and statistical significant improvements in measurements of stress and fatigue post-meditation using MBSR. The average sleep duration improved from six to seven hours per night. The 63 cancer patients in this study attended weekly 90-minute meditation sessions. Both the studies by Zhang et al., (2015) and Carlson and Garland (2005) suggest that MBSR is beneficial for insomnia management, including for the elderly and those with chronic conditions such as cancer.

In a RCT with 34 participants, Jain and Shapiro (2013) use three instructional sessions of meditation in a group format over the course of one month. Each session lasted 45 minutes and incrementally taught breathing exercises, a technique of meditative imagery (MI), and a non-judgmental awareness (NJA) meditation. Researchers instructed participants to practice meditation once during the day and immediately prior to bedtime for 20 to 30 minutes each time. Researchers assess the impact of insomnia meditation and record improvements in TST and daytime function at three to four weeks post introduction.

Hypnosis. The definition of hypnosis is “a therapeutic technique in which clinicians make suggestions to individuals who have undergone a procedure designed to relax them and focus their minds” (Hypnosis, 2000, para 1). While few studies exist regarding the role of hypnosis for the treatment of insomnia, results have been favorable in use of hypnosis for

insomnia therapy (Lacramioara, Manuela, Alin, Dumitru, & Radu, 2013).

Lam et al. (2015) completed a meta-analysis of six RCTs with 502 participants on the effects of hypnosis on insomnia. They compare standardized, in-person hypnosis consisting of the induction or trance phase followed by the use of direct relaxation suggestions, guided meditation, compartmentalizing distractions, and progressive relaxation. Lam et al. (2015) conclude that hypnosis is a viable alternative to medication with minimal side effects; however, the practitioner's technique may have a role on the effectiveness of hypnosis depending on their skill, rapport with the client, types of therapy, and suggestions used. Lacramioara et al. (2013) concur that hypnosis elicits no side effects or risk of dependence for the treatment of chronic insomnia.

Massage therapy. According to Cassileth and Vickers (2004), massage therapy is the “manipulation of soft tissue areas of the body” (p. 244). Massage therapists perform massage on client’s to relieve muscular tension, reduce stress, promote relaxation, and enhance sleep.

In a random-controlled pilot trial, Sjöling, Ljadas, Appelberg, and Englund (2010) detail improvements in subjective parameters of sleep quality in 30 women diagnosed with primary insomnia. Cassileth and Vickers (2004) find that massage therapy made a tangible difference in nearly 1,300 cancer patients in a three-year period for self-rated symptoms of pain, anxiety, depression, fatigue, and nausea. The improvements were significant for the symptoms of anxiety, fatigue, and pain. Although insomnia was not included as an endpoint measurement of the research, a reduction of symptoms in cancer patients can assist in their management of insomnia, which can lead to an overall improved QOL.

In a RCT of 57 women, Kashani and Kashani (2014) note an improvement in scores for

quality of sleep between the control and experimental groups. There was also a significant improvement in PSQI ratings post-intervention in the experimental massage group (Kashani & Kashani, 2014). Oliveira, Hachul, Goto, Tufik, and Bittencourt (2012) also demonstrate improvements in insomnia in a RCT of 44 postmenopausal women. Depression and postmenopausal QOL scores increased in the massage group versus the control and passive movement group. Massage appears to be an effective treatment modality for insomnia in multiple populations.

Movement. In this section, we introduce qigong and tai chi chih, two traditional forms of Chinese movement exercises. Qigong uses energy (Qi) to balance the energy flow in the body meridians through breathing, postures, and movements (Chan et al., 2014). In a random waitlist controlled study, Chan et al. (2014) evaluate the effects of regular qigong practice in individuals with insomnia, anxiety, and depression with a chronic fatigue syndrome. The qigong practice group demonstrates improvement in SL and subjective sleep quality in comparison to the waitlist control group, with sleep quality and SL gains related to the amount of practice by participants. At the three-month follow-up, improvements persisted. Mild muscle soreness was the only side effect (Chan et al., 2014).

Tai chi chih is an ancient mind-body meditative practice rooted in Chinese medicine that uses slow, controlled movements for relaxation and wellbeing (Motivala, Sollers, Thayer, & Irwin, 2006b). Tai chi chih is the westernized model of tai chi (Irwin, Olmstead, & Motivala, 2008). Irwin et al., (2008) examine the benefits of tai chi chih on moderate insomnia in a single-blinded RCT with participants randomized to a tai chi chih group or a control (health education) group for 16 weeks. The results indicate a statistically significant improvement in four sleep

parameters in the tai chi chih group 25 weeks follow-up. Sixty-three percent of the tai chi chih participants with sleep impairments improve with a normal PSQI threshold (< 5) as opposed to 32% of the sleep-impaired participants in the control group (Irwin et al., 2008).

Irwin et al. (2014) also confirm that tai chi chih decreases systemic inflammation markers in a RCT of tai chi chih versus CBT-I in breast cancer survivors with insomnia. Three months of tai chi chih in the first experimental group versus the same amount of CBT-I in the second group reduce two of three cellular markers of inflammation in the tai chi chih group of cancer survivors, pointing to immune responsiveness improvement in breast cancer clients with comorbid insomnia (Irwin et al., 2014). The significance of this study is that serious illness (such as breast cancer) increases inflammatory markers, and sleep disturbances also contribute to this inflammation through increased SNS activity; tai chi chih mediates this increase of the SNS through its slow, flowing, meditative movements (Irwin et al, 2014). Motivala et al. (2006b), investigate tai chi chih versus passive resting in older adults, and also find that tai chi chih is effective in decreasing SNS activity. Tai chi chih is a promising treatment for patients with chronic insomnia and sleep disorders. The studies do not identify contraindications or limitations of using tai chi chih for insomnia.

Relaxation and breathing techniques. Relaxation and breathing techniques are the intentional actions of using slow and controlled respiration and focal muscle relaxation to reduce muscle tension, induce a quiet body response, and slow the activity of the brain (Konsta et al., 2013). Sleep hygiene and stimulus control, along with relaxation and breathing techniques, have demonstrate a modest improvement in SL and sleep maintenance (Pallesen et al., 2003).

Relaxation techniques and focused breathing decrease cortisol levels, suggesting a reduction in

the stress response to emotional and physiological triggers. Guided imagery, diaphragmatic breathing, and progressive muscle relaxation are simple techniques, which are effective, low cost, and offer an alternative to pharmacology for the treatment of insomnia (Konsta et al., 2013).

Although there is evidence-based research that supports relaxation techniques as a single modality, patients can practice these techniques either individually or as an adjunct to other integrative mind-body modalities, such as mindfulness meditation, tai chi chih, and yoga (Hariprasad et al., 2013; Jain & Shapiro, 2013; Pallesen et al., 2003; Waters et al., 2003)

Yoga. Yoga is an ancient Indian philosophy of movement, breathing, and meditation that seeks to balance the body, mind, and spirit (Cohen, Warneke, Fouladi, Rodriguez, & Chaoul-Reich, 2004; Hariprasad et al., 2013; Khalsa, 2004; Manjunath & Telles, 2005). Yoga uses techniques of controlled breathing combined with postures and meditative techniques which promote relaxation and improve mental calmness and mindfulness (Kennedy, 2014). These are mental states that are compatible with sleep (Kennedy, 2014). There are numerous studies evaluating the benefits of yoga for insomnia management, with promising results in sleep parameters and QOL (Cohen et al., 2004; Halpern et al., 2014; Hariprasad et al., 2013; Khalsa, 2004).

Manjunath and Telles (2005) address poor sleep in a comparative study of yoga and Ayurvedic pharmacology using a self-report questionnaire for sleep ratings over a period of six months. Sixty-nine residents (60-95 years of age) with insomnia (such as wakefulness) in a residential home in India are randomly assigned to one of three groups: yoga, Ayurvedic herbal, or a control waitlist group. The yoga group demonstrates superior sleep patterns, including

improved restfulness in the morning and decreased SL at six months as compared to the Ayurvedic herbal. TST in the yoga group also continued to improve at six months follow up (Manjunath & Telles, 2005).

Halpern et al. (2014) concur that yoga benefits overall sleep patterns. Halpern et al. (2014) measure older adults' response to sleep in nonrandomized controlled trial with both subjective and objective measurements. The researchers assessed effectiveness over a 12-week period of a simple yoga practice (group and individual practice with meditation). The yoga group experiences a statistically significant subjective improvement in SE, TST and quality of sleep as opposed to the waitlist group. Interestingly, those most compliant (a subset of the yoga group log a higher compliance with home practice) also demonstrate an increased duration in slow wave sleep, the deepest level of restorative sleep.

Recent evidence-based studies link health benefits, including improved QOL, to the practice of yoga (Afonso et al., 2012; Halpern et al., 2014; Hariprasad et al., 2013; Yadav, Sarvottam, Magan, & Yadav, 2015). Researchers suggest the postures and breathing of yoga initiate a decreased CNS response by engaging the parasympathetic nervous system, as evidenced by diminished blood pressure and heart rate (Hariprasad et al., 2013; Khalsa, 2004). Study results suggest that yoga minimizes WASO, increases SE, and improves psychological parameters in QOL (Afonso et al., 2012; Cohen et al., 2004; Halpern et al., 2014; Hariprasad et al., 2013; Khalsa, 2004; Manjunath & Telles, 2005). A certified yoga instructor may provide the initial instruction on breathing and poses, but one may then continue independently (Khalsa, 2004; King et al., 2014). Yoga is a practical and safe intervention for persons with chronic disease or reduced mobility (Afonso et al., 2012; Cohen et al., 2004; Halpern et al., 2014;

Hariprasad et al., 2013; Khalsa, 2004; Manjunath, & Telles, 2005).

Client Education

Many HCPs are interested in becoming better equipped to educate and support their patients about the option of using CIT along with mainstream medical practice for chronic insomnia management (Chang et al., 2011; Milden & Stokols, 2004; Smith et al. 2015). Sierpina (2004) states that HCPs are a primary source of education for clients; therefore, educating them regarding the use of CIT in chronic insomnia, including its effectiveness, safety, and complementary qualities in mainstream medicine, is critical to our research.

CIT is still underused in the management of chronic insomnia (Gooneratne, 2008; Milden & Stokols, 2004; Pearson et al., 2006) as noted by the lack of CIT protocols for insomnia in the literature. As shown by Gooneratne (2008), Neuendorf et al. (2015) and the NCCIH (2015) there are effective CIT strategies for insomnia management. HCPs are increasingly aware of CIT, yet there is not a consolidated tool for HCPs use to address chronic insomnia in the context of chronic diseases. Ludvigsen, Stahl, Law, and Cress (2015) state: “Through advances in computer-supported collaborative learning technologies and pedagogies, we can create, shape and present knowledge in new ways. Intersubjective meanings can be developed and shared as virtual and/or physical artifacts” (p. 1). Co-creating an artifact with HCPs supports the transmission of information to address the best techniques for the management of insomnia associated with chronic conditions (Jelinek, Romme, & Boland, 2008).

Summary

Despite the strength of research supporting CIT and the complicated side effects of pharmaceuticals, HCPs manage insomnia primarily with pharmaceuticals and CBT-I (Foley et

al., 2004; Pearson et al., 2006; Saddichha, 2010; Takaesu et al., 2014). CBT-I is not readily accessible due to the lack of therapists, plus it requires multiple visits for the therapy, which creates compliance and cost issues (Anderson et al., 2014; Ellis et al., 2015; Shahid et al., 2012; Vyas, 2013). The most commonly cited explanations for this limited insomnia management using CIT by HCPs include insufficient time during healthcare visits and the dearth of best available specialized knowledge of CIT (Benca, 2005; Chang et al., 2011; Everitt et al., 2014; Long et al., 2001; Milden & Stokols, 2004). Also, patients often do not address insomnia with their provider until it becomes a significant health burden (Benca, 2005; Milden & Stokols, 2004; Saddichha, 2010; Schutte-Rodin et al., 2008; Shahid et al., 2012). Despite a majority of the general population using some form of CIT for personal health issues, only 4-5% use CIT specifically for insomnia treatment (Gooneratne, 2008; Pearson et al., 2006), representing a lack of alternative options for safe, cost-effective, accessible and evidence-based insomnia management. Our research purpose is to co-create with HCPs an educational artifact that helps them inform their chronically ill patients about evidence-based CIT for insomnia management.

Lenses

The purpose of this chapter is to articulate and define the lenses that influence the selection, design, implementation, and interpretation of our research project. When conducting qualitative research, the theoretical, professional, and personal lenses are complex, and therefore it is important to clarify our perspectives and biases. First, we share how the paradigm and culture of inquiry affects our research. Next, we focus on our interpretation of the theoretical philosophies of contemporary research, including our epistemology, ontology, and axiology, and how these define our research process. Following, we outline the two theoretical underpinnings of our research: the Biopsychosocial Model of Health and the 3-P Model. In the final section, we consider the professional and personal lenses of each research team member and how our lenses influence our research.

Research Paradigm

Our research is positioned within the critical paradigm, which suggests that pure objectivity is not entirely possible, or even desirable. When vested in the critical paradigm, researchers acknowledge more than one viewpoint; the values and knowledge of the qualitative researcher intertwine with the values and knowledge of the research participants (Guba & Lincoln, 1994). As researchers rooted in a holistic approach to health, we are interested in ascertaining the opinions of healthcare providers, and raising their awareness of the integration of holistic practices with mainstream medicine for the management of insomnia.

A subjectivist epistemology defines our theoretical research lens. Our knowledge comes from our own set of experiences and therefore influences our perspectives of our research inquiry. The collaborative approach between the holistic-minded researchers invites input from

the allopathic HCPs. Thus, the purpose of co-creating educational material elicits the perspectives of both the researchers and the participants, which enables an opportunity to discover alternative approaches for management of insomnia. The axiology, or the set of values that underpin the research, is to improve the QOL of individuals with insomnia with the use of complementary and integrative therapies (CIT).

Culture of Inquiry: Design and Development Inquiry

Design and development inquiry is a problem-driven culture of inquiry that supports context-specific research (Ellis & Levy, 2010). In this case, the problem is that some HCPs are not aware of and do not recommend CIT for chronic insomnia despite the compelling scientific evidence. We designed and developed, in conjunction with the literature and HCPs, the content of an artifact to educate HCPs and patients about CIT interventions for insomnia. After we developed the educational artifact, we emailed it to two HCPs and asked for feedback via a pilot survey. The survey questions are specific to our research purpose, looking for participants' opinions, attitudes, and intentions about integrating CIT into a mainstream medical practice. We then use the evaluative feedback to designate key components. Our research team appreciates the tangible advantages that design and development research offers in our study, in that it can increase the visibility of additional approaches of insomnia management that are safe and effective (Owen, Lewith, & Stephens, 2001). We describe our theoretical lenses in the next section.

Theoretical Lenses

We have identified two guiding theoretical models, the Biopsychosocial Model of Health and the 3-P Model, that support the usefulness of integrating complementary practices into health

maintenance and more specifically that support the use of CIT for management of insomnia. Below, we define and describe each model.

Biopsychosocial Model of Health. The Engel Theory of Biopsychosocial Model of Health describes a complex interaction of personhood and environment (Bornell-Carrio, Suchman, & Epstein, 2004). Engel's Theory of Biopsychosocial Health supports a holistic view of health, and more specifically, suggests that diseases are the result of multifactorial interactions that are not all measurable and are very complex (Bornell-Carrio et al., 2004). Engel's theory suggests that HCPs are required to be a part of an intuitive, patient-centered approach since subjective symptoms need to be treated along with the objective data, because pure objectivity is not possible during a physician encounter with a patient (Bornell-Carrio et al., 2004). Thus, Engel's theory states that treatment of a disorder is not always linear.

Being critical of the dualistic model of health that separates the body from the mind, we believe that the body and mind are intertwined and are involved in a partnership that is evident in the literature: that stress leads to chronic insomnia, which leads to chronic disease. This theory supports a partnership between the patient and the HCP in the management of disease (insomnia), and for patients to be empowered in caring for their own health and wellness. Subjectivity is a part of the clinical approach for disease management. Therefore, we combined the data from the literature and the evaluative feedback from the survey to co-create an educational artifact that supports the process of incorporating both objective and subjective assessments for insomnia diagnosis and treatments in an office visit. The second theory, the 3-P Model, defines which modalities would be most effective for chronic insomnia.

The 3-P Model. There are multiple factors that lead to the development of insomnia.

Spielman's Model of Chronic Insomnia known as the "3-P Model," identifies three categories of triggers to chronic insomnia (Erman, 2007). The three Ps include predisposing factors (personal characteristics such as excessive worry and rigidity in thought regarding sleep), precipitating factors (emotional and physiological stressors), and perpetuating factors (poor adaptive behaviors and conditioned responses). Understanding the underlying processes that affect the development of insomnia assist the HCP in modifying potential triggers that perpetuate insomnia into a chronic condition (Erman, 2007). In our project, as a result of reviewing the literature, we chose four evidence-based CIT that have the potential to affect each of the three Ps. In the literature, yoga, mindfulness meditation, relaxation and breathing techniques, and aromatherapy show promise of alleviating some of the precipitating stressors; and they also address poor adaptive behaviors of those with chronic insomnia (Halpern et al., 2014; Hwang & Shin, 2015; Kabat-Zinn & University of Massachusetts Medical Center/Worcester, 1991; Ong et al., 2007; Tsai, Kuo, Lee, & Yang, 2015).

Professional and Personal Lenses

Next, we address our professional and personal lenses and describe how these lenses affected the development, implementation, and interpretation of this project. Our lenses represent each researcher's unique experiences and perceptions that together influence the qualitative research process. Acknowledgements of the lenses provide integrity and clarification of our biases.

Mary McKinley. A lens, like a camera lens, focuses on one area. It may be broad or close up but it allows the viewer, or reader, to see what the artist, or writer, feels is important. Sometimes a personal lens can be quite different from a professional lens. For this thesis, the two

lenses are part of the bigger picture that made me who I am, how I ended up where I am today, and my plans for the future.

I have spent over 30 years in the field of sleep medicine, starting as a sleep technologist with a background in neurodiagnostic technology. As my experience increased, I began lecturing and teaching (both as formal instruction and as short presentations) all aspects of sleep medicine and technology around the world, from Australia to Scotland and many points between. I have a deep interest in the treatment of insomnia after observing that many physicians usually ignore it as not important, too much trouble to treat, or not cost effective to treat. Consequently, I wanted to include HCPs in the development of a tool to treat insomnia because personally dealing with both insomnia and a chronic disease, I recognize the importance of self-care and self-advocacy.

In 1985, I was very lucky to get a job at the Minnesota Regional Sleep Disorders Center (MRSCD), the third oldest sleep center in the United States, and to work with other medical professionals who loved teaching. This was when the field of sleep medicine started its rapid growth as researchers and staff in clinical settings discovered more and more sleep disorders, many at the MRSCD. Finally, sleep, or lack thereof, received medical recognition as a factor in one's overall health. Dr. Colin Sullivan from Australia developed Continuous Positive Airway Pressure (CPAP) and finally, overnight, I could change someone's life and make them better by providing them equipment to keep them breathing at night and not have an interrupted sleep cycle. It was a powerful feeling of healing and I knew that I had found my calling and therefore, for this research, wanted to make the results of our study publicly available via providing HCPs and patients with information that can improve their health and their lives. I saw, firsthand the improvement in patient health, both physical and mental, and over the years also saw the lack of

recognition and treatment of insomnia. If I can provide that education and treatment to insomniacs, then they, too, can discover a healthier, happier life.

Professionally, I work primarily in the positivist paradigm, which is contrary to my personal paradigm. My professional ontology is the realm of positivism. Very specific rules that must be followed in sleep medicine has to meet the standards of the profession. There are specific standards to quantify stages of sleep and events that occur during sleep. My professional epistemology is positivism because opinion in the strict scientific needs of data analysis leaves no room for bias or creativity. As a medical worker my professional axiology, the study of the nature of value and valuation and of the kinds of things, is positivism with sleep data analyzed in a specific order to meet standardized guidelines so the disorder is best diagnosed and controlled by the HCP and patients

At its simplest, a paradigm is a distinct set of concepts or thought patterns, including theories, research methods, postulates, and standards, for what constitutes legitimate contributions to a field. Personally, I fall within the interpretive ontology, with the knowledge of my reality being that there is no one reality. Everyone has their own reality and it changes depending on the situation, just as there is no one truth, no black and no white. Everything is a shade of grey on my spectrum.

I am essentially subjectivist when it comes to epistemology, or what is known. That is, objectivity isn't possible, no matter how important it may seem to be. My thoughts, feelings, and experiences will always color what I see and how I respond. The critical paradigm of methodology, the how of life, to use methods and to discover and facilitate transformation, and update old ideas, is where I feel the best fit.

I have always loved sleep. As a kid, I remember all the rituals: brushing teeth, saying prayers, being read to, and finally snuggling down into that very special bed. I would pull up all the covers just so, with the cool side of the pillow under my cheek, and drift off into dreamland. Then as a teen, sleep was even more precious, but the hours shifted. Falling asleep early didn't happen, and I could happily sleep in until noon, and did, when given the chance.

When I was about 13, my mom became gradually more bedridden and the majority of her care— feeding, bathing, and other activities of daily living— became my responsibility as the oldest kid at home who wasn't working and/or in college. Other than taking care of her basic needs, there was nothing I could do. I couldn't make her well or even some days, make her comfortable. I knew then that I would never be a nurse since I wanted to be able to cure people, not just care for them. As a sleep technologist, I was able to change someone's life and health, literally overnight, satisfying the need inside me to cure, not just comfort.

Since those early days, I have learned more about sleep and had many life changes including developing a chronic disease, living through menopause, and several personal and family health issues, which both created and then exacerbated my insomnia. Having tried many remedies and even resorting (short-term) to use of hypnotics, I knew there had to be a better solution for my insomnia and one that didn't interfere with my medications. I wanted one approach that didn't require a lot of time, money, and effort on my part and that actually worked.

My doctors were not able to help me. They wanted to resort to hypnotics and many were unaware of the fact that menopause decreased formation of melatonin and beta blockers stopped it, so I had to educate them. It was then I realized there needed to be information provided for people who had insomnia and a chronic condition making sleep an elusive goal, since up to 80%

of patients with a chronic condition also have insomnia, and the idea for this project was born. This project naturally emerged out of my own lived experiences with chronic illness and insomnia.

My personal lenses drive me to be a creator, not a reporter. I want to build something useful, to leave a legacy. Creating a resource that is useful and fills one of the needs for improving sleep and health is my goal. I recognize that there are multiple ways of teaching and learning, as well as accessing material, and what I see isn't necessarily what others see. I want to change HCPs attitudes and opinions and educate them in alternative courses of treatment. Applied research seems like the most effective way to meet this need for improving insomnia.

Our research was designed with this outcome in mind: to co-create with HCPs ways of improving and managing insomnia that met strict criteria of “first, do no harm”, or evidenced based practices that have no drug interactions, are easily accessible, and affordable. Creation, education, and dissemination of insomnia management techniques are the necessary steps to better sleep and health.

Nicole Anderson. In January of 2004, I experienced the death of my former life due to chronic disease. After one year of being treated like a statistic instead of a human being by two allopathic practitioners, a coworker referred me to a holistic chiropractor. This holistic chiropractor introduced me to healthcare options I never knew existed. He expanded my knowledge base, which brought to my consciousness a suppressed belief system. In meeting this chiropractor and being exposed to new healthcare options, I identified the first passions of my life. Also, I experienced personal freedom from the expectations and beliefs I felt were placed upon me by my parents, family, friends, school, church, and community. Thus, I began a journey

to understand who I was and what I believed.

Over the years, I came to the realization that I have all the knowledge within myself to heal. I believe that I am the expert of my body and welcome a partnership with a practitioner to explore ways that support my physical, mental, and spiritual health. I cannot describe the pure joy and peace I feel when being surrounded by holistic health resources, for example, practitioners, books, online patient blogs, or documentaries. I want to share the wisdom of all the creators of these health resources with the world. I was thoroughly excited to work on a research project that included complementary and integrative therapies (CIT) for school. In our project on CIT for insomnia management, I got to combine my passion for CIT, my internal desire to introduce other people to their healthcare options, and my aspiration to partner with practitioners.

I am interested in starting my own business and collaborating with other online health resource creators. My passion is to create, which I allowed myself to explore in my undergraduate studies. I arrived at college in the pursuit of a Business Administration degree. The universe altered my journey, which led me to Media and Communications. Some of the more challenging yet incredibly fulfilling classes I enrolled in were Writing for the Screen, Documentary Filmmaking, Creative Process, Narrative I, Memoir Writing, The Successful Entrepreneur, and The Power of Media Marketing. The hours I put into these classes were beyond full-time because I had no prior knowledge or skills in any of these courses. Upon entering graduate school, I knew the research series of classes would be my greatest challenge. My inclination was to be part of an applied research project. I understood that an applied project would align with my passion for creating and my ability to work long hours to produce a product.

Juliana Sayner. Within the medical community, the results of objective empirical studies drive the development of best medical practice. As a nurse, I was educated in a positivist paradigm, where evidence-based research supports appropriate nursing interventions for patient care. However, with years of experience a shift occurred in my epistemology and ontology of deciphering the spectrum of human illness and wellness of those with acute and chronic conditions. I moved from a positivist approach to a more critical paradigm, in which health is not always about the absence of physical illness. My lens as a holistic health researcher is closely linked to my experiences as an oncology nurse. My personal and professional lenses are congruent, being a registered nurse is as much a part of my personal identity as it is representing my professional lense.

Individuals living with a terminal disease are in a unique situation where wholism, personal experiences, and subjective data are just as important as a reductionist goal. When patients shared their experiences and perspectives of living with cancer, their insights became landmark moments of my understanding that health and disease are not mutually exclusive. I am passionate about research that improves the quality of life for those living with a chronic illness, and I have observed insomnia to be detrimental to health. Insomnia is a commonplace occurrence within the oncology population. It is also a distressing side effect that adversely affects an individual's quality of life. Oncology patients are already replete with prescriptions; therefore, I am excited to explore a non-pharmacological pathway for the management of insomnia. Using a design and development method of inquiry supports my professional interest in applying the current evidence-based research on insomnia to a holistic model of care for insomnia management. Our research on insomnia management is congruent with my goal to

introduce complementary and integrative modalities within a medical setting, in order to improve the quality of life of those with chronic illness living with insomnia. The four modalities included in our research represent interventions that can be introduced by nursing staff, family members or other care providers, without requiring a physician's order.

Professionally, I have had the opportunity to start bridging the connections of integrative therapies to the oncology population. The Northfield Hospital is offering aromatherapy patches to their patients. As a result of my proposal, the program was initially piloted in the Cancer Center.

Lisa Benson. My personal journey has been rich and fulfilling and started on the Midwestern prairie of Minnesota. My father and mother taught me to cherish the land, to find beauty through artistic pursuits, and to always care for other people, just as we cared for the land. Knowledge was as vast as the countryside surrounding me; this has influenced my ability to look at an ever-changing environment and understand that we must be flexible and comfortable with change to solve complex problems that require multifaceted solutions.

In nursing school, I learned the art and science of caring for my patients. We used a theory called the Roy Adaptation Model (Roy & Andrews, 1999). The Roy Adaptation Model included the mechanistic assumption that the body can be broken down into parts, but also incorporated the assessment of biopsychosocial factors for promoting wellness in patient care. Although I was grounded in the positivist paradigm during my undergraduate education, this conceptual model, which focused on promoting adaptation of the patient in social, self-concept, environmental and physiologic areas, the biopsychosocial component and integration of these components made more and more sense to me. Holistic care in medicine and nursing, with its

tenants of mind, body, and soul intertwined compelled me to re-define my nursing framework and attitudes toward patient care to a more holistic, integrated view, as my career led me to a different area: community nursing at a home care agency and eventually at a public health agency.

After nursing school, my views of medicine and my personal values continued to evolve as I observed the reality of chronic diseases in my clients; that some people did well with conventional care, but many others did not. My gut told me that wellness was not linked to conventional medical care and pharmaceuticals, and that there are other factors critical for health and healing. Eventually I experienced this reality after a work injury sidelined my activities, and I developed pain and fatigue issues, which persisted after medical treatment. I finally sought out holistic care from a chiropractor. Several years later, the same practitioner successfully used acupuncture for severe wrist pain, a consequence of overuse from holding my newborn son during endless sleepless nights when he cried incessantly with colic for a full nine months (and then cried several more months with bilateral ear infections). Initially, I called my primary provider and received a script for pain medication. It did not help my issues at all, and I was upset with the systematic approach, which is typical for the conventional approach to illness. I returned to the holistic provider; after two sessions of acupuncture, the pain was gone and did not return. These episodes opened my eyes to a new worldview, one that is transformative, and aware of the limitations of Western medicine.

Since then, my paradigm has drifted into the critical area with my awareness of individual realities in wellness. My current position as an adult mental health registered nurse has solidified my position in the critical paradigm, although I am also deeply influenced by

evidence-based research since I work in a conventional setting with medical and psychiatric providers. My primary objective is to manage medications for severe and persistently mentally ill clients, which means that I must use my skills to assess for drug interactions and side effects during my visits with clients. Insomnia is a frequent problem for my clients, and I am able to use the knowledge gleaned from this project as I work to help them get more sleep and better manage their daily lives. Wellness varies greatly for them, and it is often dependent on medication compliance. However, it is very gratifying to observe that many psychiatric advanced practice nurses and psychiatrists frequently use pharmaceuticals and holistic interventions concurrently for insomnia and mental health.

My current journey has led me full circle. What I felt in my gut as a younger nurse: assessment of the whole person (body/mind/spirit), reliable evidence-based information, and self-empowerment are tools that all healthcare providers need to assist clients to find their own healing from disease, that this is good nursing practice. Integrative care alongside conventional care is necessary to treat the whole person. For our health system to be more effective, there needs to be a shift in our perceptions as healthcare providers. Absence of disease is not the goal we need to achieve; rather, a more compassionate and truthful partnership with clients will assist them to reach their own definition of health and wellness.

As a nurse, design and develop research has significant applications for my own professional practice, and my lens as a professional nurse, since it allows for a bridging solution from theory to practice. The creation of an evidence-based CIT artifact for insomnia, derived from the literature and the feedback from our survey participants, is a practical tool that I can use in my current nursing practice with clients. Falling and staying asleep is a formidable obstacle

for so many, and I am excited to be a partner to my clients and assist them as they discover their own pathways to wellness.

As researchers, we feel confident that integrative medicine is definitely part of the solution in the pervasive problem of chronic insomnia associated with chronic disease. Our project will add insight and awareness to integrative practices and mind-body-spirit healing for chronic insomnia.

Method

The purpose of this chapter is to outline the design and development research method we used to create an educational artifact about effective complementary and integrative therapies (CIT) for the management of insomnia. We begin this chapter with the rationale for our critical paradigm, the culture of inquiry, and method of design. Next, we describe the framework for the six-step methodology of design and development research. We conclude the chapter by discussing the ethical considerations of human subjects' research, our demonstration of rigor, and the limitations of the research design.

Rationale

To begin this section we discuss why we framed this project within the critical paradigm and why chose design and development research as our culture of inquiry and method of design.

Critical paradigm. According to Guba and Lincoln (1994), researchers use the critical paradigm in qualitative research as a means to recognize and empower individuals for change where both dialogue and diverse experiences are valued components of the research process. Through the critical research process, both the researcher and the participants may uncover a new expertise and experience a transformative enterprise.

The critical paradigm is based on subjectivism, not on empiricism (Rallis & Rossman, 2012). The medical community is not grounded in the subjective worldview, instead they are established in an objective positivist approach to knowledge; bridging this difference is an important consideration for change and the rationale for pursuing design and development research. An important component of the critical paradigm is the ability to acknowledge some of the diverse beliefs and opinions of healthcare providers (HCPs), such that the values of the

researcher (subjectivism) intertwine with the values of the research participants (empiricism) to facilitate change (Guba & Lincoln, 1994).

Design and development inquiry. Design and development research is both a culture of inquiry and method of design. Richey and Klein (2007) specified the definition to the education domain by defining this type of research as: “the systematic study of design, development and evaluation processes with the aim of establishing an empirical basis for the creation of instructional and non-instructional products” (p. xv). This method of research encourages creative and practical solutions to problems that are challenging and complex in nature. Design and development research is a “problem driven” approach (Ellis & Levy, 2010, p. 109). In our research, the design and development framework supports the systematic use of evidence-based knowledge from the literature to construct an artifact that serves as a tool to incorporate CIT into HCPs’ practices for the management of insomnia (Ellis & Levy, 2010).

A major strength of our research design is that we identify and address a real life problem with a solution-focused design. We derive our research problem from the literature, as well as our professional experience, which is a vital foundation for the research process using the six-step design and development research methodology (Ellis & Levy, 2010).

Framework for Design and Development Research

Design and development research involves six designated steps; identifying the problem, describing the objective, designing and developing the artifact, testing the artifact, evaluating testing results, and communicating the testing results (Ellis & Levy, 2010; Richey & Klein, 2007).

Identify the problem. We use our extensive clinical experience along with the literature

review to identify a problem: despite the strength of research supporting CIT, HCPs primarily manage insomnia with pharmaceuticals (Foley et al., 2004). Furthermore, while a majority of the general population use some form of CIT, only 4-5% use CIT specifically for insomnia (Pearson et al., 2006). Research confirms that HCPs increasingly support the use of CIT (Bjerså et al., 2012; Milden & Stokols, 2004; Münstedt et al., 2011), so the focus of our project is on how to best inform HCPs about a mind-body approach to supplement current standard practices for insomnia management.

Describe the objective. Our research purpose is to co-create with HCPs an educational artifact that helps them inform their chronically ill patients about evidence-based CIT for insomnia management.

Design and develop the artifact. To construct the content of the artifact, we first organized the literature as a data source, and then created a draft of the educational artifact (refer Appendices B and C for educational artifact drafts).

Organizing the literature as a data source. Organizing and evaluating the literature as a data source included two processes: a literature selection process and a CIT selection process. We identified key components from the literature, including emerging themes and the resulting four CIT for insomnia management to include in our educational artifact.

Literature selection process. After completing the literature review, we found research on 13 CIT (herbs, aromatherapy, acupuncture, energy healing including Reiki, music, mindfulness meditation, hypnosis, massage therapy, tai chi chih and qigong (movement), relaxation and breathing techniques, and yoga) in 65 articles, including RCTs, and systematic reviews. We also examined questionnaires measuring and describing medical students' and HCPs' attitudes about

integrating CIT into practice. Individually, we took notes and recorded the research summaries in a Google Sheets spreadsheet. We each added our articles to a RefWorks group database where we categorized and stored the articles.

When discussing our notes as a group, we noticed themes that emerged from the literature. The four themes were: cost of the CIT, safety of the CIT, access to the CIT, and evidence-based CIT research. We include these four themes as key components in the draft of our educational artifact and as inclusion criteria in the CIT selection process.

CIT selection process. We excluded studies based on four criteria. First, we determined that each CIT needed evidence-based research with more than one RCT supporting that CIT use for insomnia; therefore we excluded qigong, massage therapy, and energy healing. In survey responses of medical students and HCPs, safety of CIT was identified as a concern. Therefore, we excluded herbs due to the potential for herb/drug interactions. The third theme considered was out-of-pockets costs, including the lack of insurance coverage and the accessibility to credentialed CIT providers. We excluded Reiki, hypnosis, acupuncture, and tai chi chih because insurance does not generally cover the cost of seeing a specially trained CIT practitioner. Fourth, we excluded music, which although is beneficial, is culturally centered as a mainstream activity and not an integrative practice. We included in our educational artifact the four remaining CIT: aromatherapy, mindfulness meditation, relaxation and breathing techniques, and yoga. These four therapies support the defined criteria of evidence-based CIT research: safe, cost effective, and accessible.

Educational artifact draft. The architecture of our educational artifact included two sections for each modality. The first section (Definition and Summaries of the Research), we

listed a brief definition and a detailed summary of the research. This section was six pages. In the second section (CIT Research Summaries), we created a table highlighting ten sections including modality, title of article, citation, variable, sample size, abstract, cost, drug interaction, ease of use, and effectiveness. This section was 15 pages long.

Throughout our research, we refer to the document we created for our survey as an educational artifact; however, in the survey it is titled an educational resource to provide HCPs a user-friendly term.

Testing the artifact. To test the artifact, we developed a survey to elicit feedback from HCPs about the artifact. Below we describe how we: 1) developed the survey; 2) tested the pilot survey, 3) used the survey to obtain feedback about our artifact, and 4) analyzed the survey data.

Developing the survey. Since the educational artifact is an attachment in our survey, we began with formulating the survey questions and concluded with the design of the survey.

We reviewed three validated surveys prior to developing our own: Integrative Medicine Attitude Questionnaire (IMAQ), International CAM Questionnaire (I-CAM-Q), and CAM Health Belief Questionnaire (CHBQ). Each validated survey addressed HCPs beliefs and opinions of CIT (Lie & Boker, 2004; Quandt et al., 2009; Schneider, Meek, & Bell, 2003). With the assistance from a department lecturer experienced in research, we formulated and modified survey questions to create effective questions that will produce actionable insights related to our specific project.

The survey includes 13 questions (three quantitative, six qualitative, four demographic). We developed quantitative (Likert scale categorical and continuous interval) questions to understand how informative and supportive the educational artifact was for HCPs and if they

were considering the recommendation each of the four modalities for the management of insomnia. We created qualitative (open-ended) questions to increase our understanding of how to further support HCPs in the integration of CIT into their practices for insomnia management. This combined data provided detailed results of the opinions and intentions of the HCPs that elicit unique perspectives (Richey & Klein, 2007).

The design of the survey was simplistic and direct and we used Qualtrics, an online survey tool. Throughout the survey, we enabled Force Response, which required all HCPs to answer a question before proceeding to the next question. We engaged the Prevent Ballot-Box Stuffing option, which prevents HCPs from taking the survey multiple times. The email introduction (refer to Appendix B for the email introduction) included a brief introduction to the survey, described the two steps to complete the survey and contained the link to connect HCPs to the educational artifact.

The survey began with three quantitative slider response questions. After reading the question, each HCP rated the four CIT individually on a scale of zero through ten. The next section of the survey included three qualitative text-entry questions, in order to collect open-ended responses from the HCPs. We collected numeric data in two multiple-choice questions, and a rank-order question. We concluded the survey with four multiple-choice demographic questions on professional title, years of practice, age, and gender.

Piloting the survey. We emailed the pilot survey (refer to Appendix C for the pilot survey) to two participants; a respiratory therapist specializing in sleep medicine, and one of our research advisors, who is a homeopath, coach, and educator. We were interested in feedback involving the clarity of each survey question, the amount of time required to complete the

survey, and the ease of process to open, read, and submit a completed survey.

As a result of the feedback on the pilot survey, we made multiple adjustments. We changed the order of the survey questions, rephrased two survey questions, and deleted four columns from the artifact section labeled CIT Research Summaries. Specifically, we moved question one down to question eight, removed the word “modality” from questions one and two, changed the layout of the artifact from portrait to landscape, and moved the margins from one inch to one-half inch, except the bottom margin, which was decreased to a one-third inch margin. In addition, we reduced the number of columns in the artifact from ten to six by removing the columns listed as Title of Article (also listed under Citation), Cost, Drug Interaction, and Ease of Use. By making all these adjustments, we improved the clarity of the questions in the survey and the readability of the document in the educational artifact. The listed changes also decreased the total number of pages of the educational artifact from 21 to seven pages.

Administering the survey. We emailed the survey (refer to Appendix D for the survey) with attached educational artifact (refer to Appendix E for the Definitions and Summaries of the Research and Appendix F for the CIT Research Summaries in the educational artifact) via a survey software system called Qualtrics. We used the Qualtrics survey software system for creating the design of the survey, the questions, the email distribution, data and analysis, and reports of the survey.

Sampling. We selected a convenience sample of 29 actively practicing HCPs, who provide direct care to patients with chronic conditions, to evaluate the educational artifact. This sample included physicians, nurse practitioners, physician assistants, mental health therapists, and sleep medicine specialists. We asked the HCPs to forward the survey link to other qualified

colleagues (snowball sample), to enhance the variety and depth of responses.

Fourteen HCPs received emailed surveys on Sunday, January 15, and we emailed an additional 15 surveys to HCPs over the course of the next 20 days. We created a reminder email (refer to Appendix G for the reminder email), but later discovered that using an anonymous link in Qualtrics is not compatible with scheduling automatic reminder emails. Alternatively, all survey participants received a manual email on Tuesday, January 24. The survey closed on Tuesday, February 7, with 12 completed surveys and three partially completed surveys. We excluded one partially completed survey because the responses consisted of zeros and we deemed responses of zeros as unusable data. Therefore, the data analysis included 14 surveys.

Analyzing the survey data. The data analysis process consisted of two sessions, individual and group. First, we individually reviewed the responses of the open-ended questions and made a list of each of the distinct comments. As a group, we categorized the comments into six outcomes, which were unintentionally simplified versions of our survey questions: content of an educational artifact, informational sources for integrated care, best resource format, financial considerations, factors impacting integration of CIT into practice for the management of insomnia, and provider intentions of CIT for insomnia management. We concluded our analysis by synthesizing the HCPs' comments into six topic areas: components of artifact, intentions to use CIT, prioritized factors that impact CIT integration, and HCPs open response suggestions for additional artifact content, preferred format, and informational sources.

Evaluate testing results. In results, we present the data from the literature and the evaluative feedback from HCPs on the survey. We synthesize the evaluative feedback and the implications of the research results in the discussion chapter.

Communicate testing results. The final step of design and development research included communicating the results of our research to the HCPs. Due to the time constraints, we did not complete this final step of the research process. Instead, we conclude with our recommendations for the key components for an educational artifact. One research member will create a website using the key components for an educational artifact for her practicum in the fall of 2017.

Ethical Considerations

Ethical considerations are important to ensure the protection of the human subjects who participated in our study. In this project, we addressed the protection of human subjects, informed consent, coercion, and confidentiality. As graduate students conducting social and behavioral research of human subjects, we completed the Collaborative Institutional Training Initiative (CITI Program) certification. The Holistic Health Studies Program Director reviewed our applied research project application prior to the initiation of the survey, to ensure we met the requirements to uphold the integrity of our research. We received approval on our research project December 30, 2016.

Coercion was a potential risk in our research, due to the selection of HCPs from the professional networks of the researchers. To mitigate the possibility of coercion, we used the online survey software system Qualtrics to develop the anonymous links and to ensure all HCP responses were not identified with an email address. We informed participants that this was a confidential study and participation was optional. We addressed the voluntary nature of participation and the implied informed consent in the email introduction letter. Participants were able exit the survey at any time and for any reason before they submitted their answers.

To maintain confidentiality, the collected data was stored in the Qualtrics password-protected software program and then exported to an external drive for analysis. Only our research team and research advisors had access to the data during the analysis process.

Demonstration of Rigor

As researchers, we maintained the importance to uphold and ensure the reliability, validity, and rigor in our research project's design, data collection, and data analysis processes. On October 11, 2016, we started an online journal to document the discourse in the research processes. We updated the journal with the intricate details and decisions we made throughout the entire 18-month research process. Our research group texted, Skyped, and met in-person regularly. As a group, we maintained a high level of communication throughout the design, collection, and analysis phases of research, in order to continuously discuss and challenge each other's interpretations to ensure consistency in our writing. To increase our integrity and credibility, we carefully analyzed how our personal, professional, and collective group lenses may have formed biases within our research. In the lenses, we provided context of the need for transparency of our research.

Limitations

In this section, we discuss the limitations of the design and development of our research project. Limitations of the research design impacted multiple areas of the research process. The differences of the paradigms between the researchers (critical) and the HCPs (positivist) are a potential limitation in the research. Klimenko et al. (2006) establishes that mainstream medicine practitioners have different definitions of health from the complementary or integrative practitioners. Mainstream medical practitioners are more interested in the physical functioning of

the individual, whereas complementary and integrative providers are more focused on a healthy mind-body-spirit connection. Some HCPs may disregard the credibility of our study because not all the evidence based studies we evaluated for our research were conducted by physicians. Haug (1997) performed a meta-analysis study and found that HCPs prefer receiving information primarily from peer-reviewed journals.

The designer of the artifact and the researcher are the same, so the extent of the expertise of the researcher affects the strength of the design of the final product (Richey & Klein, 2005). We have no formal training in the design of new products, nor are we experts in the management of insomnia with CIT. None of us are primary care providers. To mitigate our novice status, we chose the Qualtrics survey software system, which included Qualtrics University (<https://www.qualtrics.com>). Qualtrics University is an online support system that includes an entire library of articles, manuals, and troubleshooting tools. We also consulted with more experienced researchers, piloted the survey, and revised the survey according to the feedback we received.

The convenience sample of HCPs surveyed does not represent the opinions of the greater community of HCPs caring for individuals with insomnia and chronic disease. These are not generalizable findings, but instead feedback regarding a usable format that provides CIT information to HCPs who customarily do not use or refer patients to CIT practitioners for insomnia management. In using a convenience sample of HCPs, we wanted to recruit HCPs with experience in insomnia and chronic disease and who could provide constructive feedback on the artifact.

Results

The purpose of this chapter is to report the findings on the design and development research for the creation of an educational artifact addressing CIT for insomnia management for individuals living with chronic diseases. We first address the results of organizing and analyzing the literature as a data source. Next, we discuss the results of the evaluative feedback from our panel of experts (HCPs). Finally, we apply the literature and evaluative feedback to recommend 17 key components to include in the educational artifact.

Results of Organizing and Analyzing the Literature as a Data Source

Based on the literature review, we identify four key components used as inclusion criteria of the educational artifact draft:

- Cost of the CIT
- Safety of the CIT
- Access to the CIT
- Evidence-based CIT research

We also identify four evidence-based integrative therapies for the management of insomnia:

- Aromatherapy
- Mindfulness meditation
- Relaxation and breathing techniques
- Yoga

We then select three core components to include in the educational artifact draft:

- Modality definition

- Modality summary of the research
- Modality CIT research summaries

We set our parameters based on key components and evidence-based therapies before moving on to the evaluative feedback involving our panel of experts. This provides a base to create both the educational artifacts and the survey.

Evaluative Feedback

In this section, we present the survey results from of our panel of experts about the educational artifact. We begin with a description of the participants and then provide details on the survey feedback.

Description of participants. We include results from 14 surveys in this analysis. Two participants did not provide demographic data. Three physicians, three nurse practitioners, and six mental health therapists completed the demographic questions, with four male and eight female participants. The HCPs' years in practice are as follows: 0-10 years (n=3), 11-20 years (n=3), 21-30 years (n=5), and 31-40 years (n=1). Eight percent (n=1) of participants are under 30 years of age, 42% (n=5) are 41-50 years of age, 33% (n=4) are 51-60 years of age, and 17% (n=2) over 60 years of age.

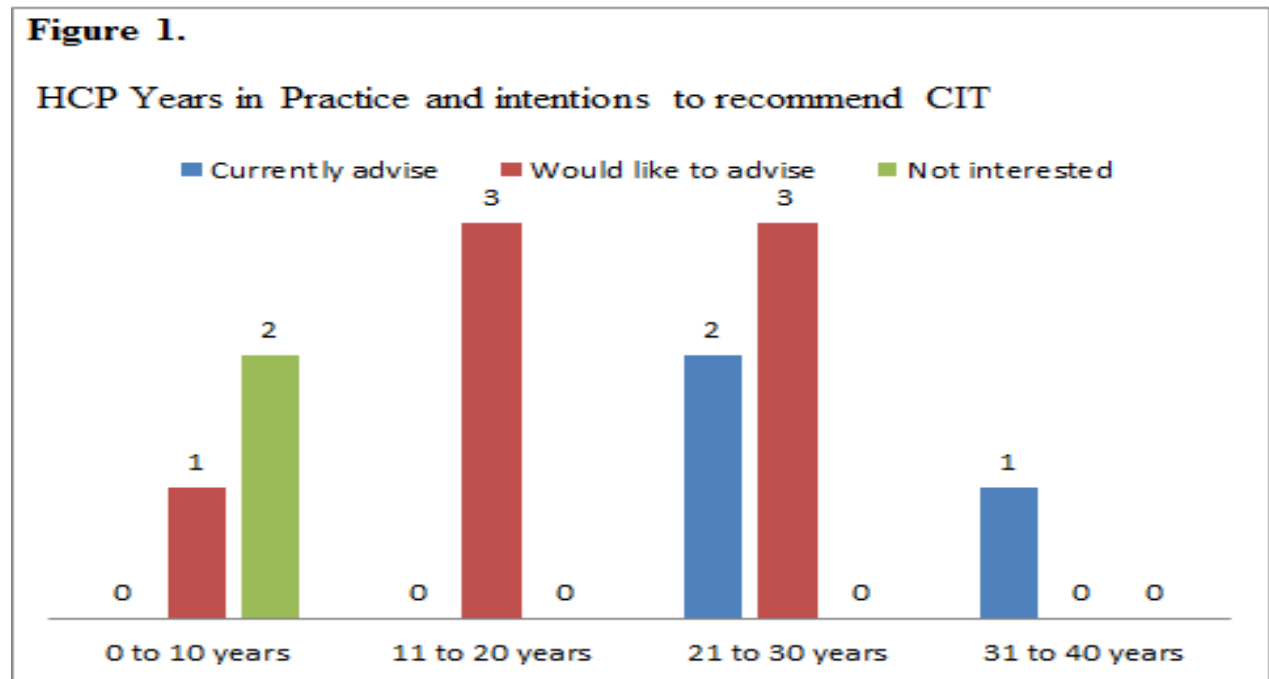
Components of artifact. In the survey, HCPs evaluate the three content components of the educational artifact and provide feedback on its usability. We ask these questions to understand two criteria: if the definitions and summaries of the research provide adequate support for the use of these four integrative practices within a conventional medical practice and how likely HCPs are to recommend any of the four modalities to assist in the management of chronic insomnia. HCPs respond to the clarity and usability of the aromatherapy definition with

the highest mean. According to HCPs, the CIT research summary for relaxation and breathing techniques contains the most usable information. Of our four presented modalities, HCPs preferred modality is mindfulness meditation for chronic insomnia management, followed by aromatherapy, relaxation and breathing techniques, and, lastly, yoga. Yoga received the lowest scores in all three areas of content component feedback. We summarize these results in Table 1.

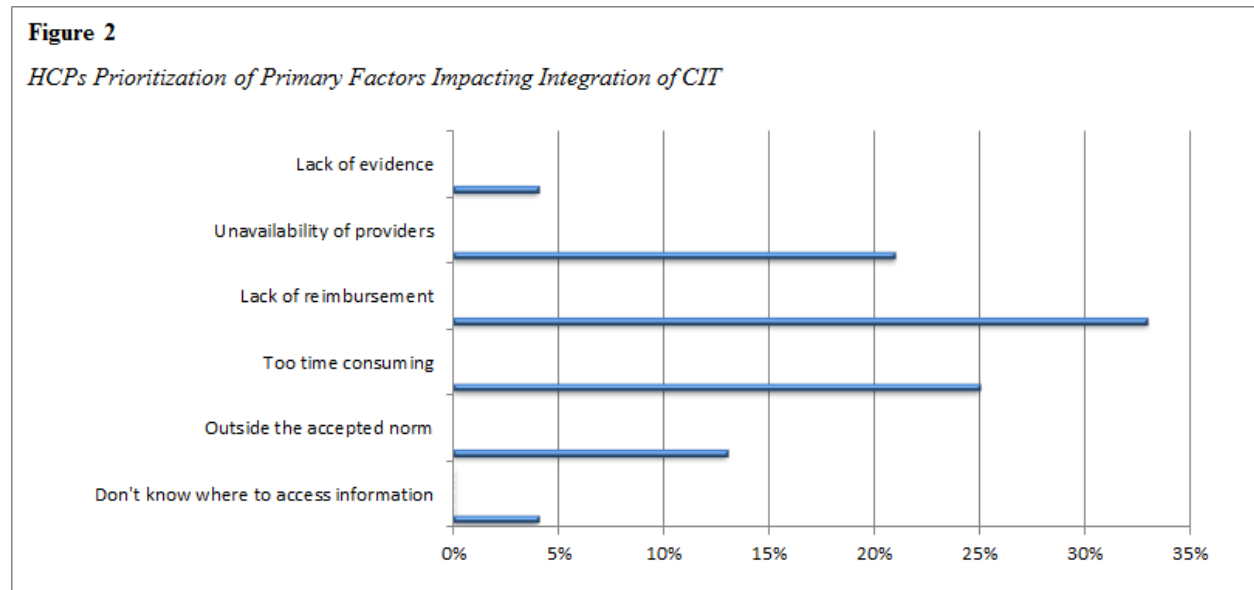
Modality	Definitions (M) Range	Research Summary (M) Range	Likelihood for Recommendation (M) Range
Aromatherapy	7.6 (6-10)	7.9 (5-10)	7.6 (3-10)
Relaxation and Breathing Techniques	7.3 (2-10)	8.0 (5-10)	7.0 (2-10)
Mindfulness Meditation	7.4 (4-10)	7.9 (5-10)	7.8 (3-10)
Yoga	6.7 (3-10)	7.8 (5-9)	6.9 (3-10)

Note. M = mean of N=14. Range= range of responses (1-10)

HCPs intentions to use CIT. We are interested in the HCPs' intentions to use integrative practices for the management of insomnia. Fifty-eight percent (n=7) state they would like to be able to advise patients about common integrative practices for chronic insomnia. Twenty-five percent (n=3) currently advise their patients about common integrative practices for chronic insomnia. Two therapists, with less than ten years of professional experience, respond with no interest in advising their patients about integrative practices for chronic insomnia. We summarize this data in Figure 1.



HCPs prioritize factors influencing CIT integration. HCPs rated six factors, in order of priority, on how they affect their intentions to integrate CIT into their practice for the management of chronic insomnia. They cited lack of reimbursement as the foremost priority that affects their decision to integrate CIT into the management of insomnia, representing 33% of all the HCPs' responses. More than 20% of the HCPs stated time and the unavailability of providers as their priorities; whereas lack of evidence for practice and where to access resources about evidence-based practice received less than 10% of responses. HCPs prioritized the six listed factors, measured as a percentage of the overall responses as shown in figure two.



Note. Results expressed as a percentage of the overall responses, total=100%

HCPs suggest additional content for artifact. In an open-ended question, we summarize HCPs comments on additional content needed to strengthen the usability of the educational artifact:

- How to introduce CIT to patients
- Specific instructions and examples for each modality

Format for artifact. In a multiple-choice question, HCPs respond to what format they prefer for the educational artifact. We received 12 responses: a website (n=8), an app (n=3), and a brochure (n=1).

Informational sources for integrated care. HCPs identify the primary sources (many choosing multiple sources) that they use to stay current, including trainings sessions, workshops, and conferences (n=7), internet searches (n=6), consult with colleagues or consultants (n=5), personal or client experience (n=3), and professional journals and magazines (n=3).

After analyzing the evaluative feedback results, we identify six key outcomes. The first

key outcome of HCPs' responses is that a website would be the most useful format for an educational artifact. The second key outcome is the variety of sources HCPs use to obtain information about integrative care for patients. Information on introducing CIT to patients is the third key outcome, and specific instructions and examples for each modality is the fourth key outcome. Because HCPs prioritized "too time consuming" as their second highest factor affecting the integration of CIT into their practice, we list "addresses time constraints of HCPs" as the fifth key outcome. While HCPs prioritized lack of reimbursement as their highest factor affecting the integration of CIT into their practice for the management of insomnia, they also respond with "cost of each modality," "cost effective manner," and "clients fall under poverty guidelines." We classified this information into the sixth key outcome of out-of-pocket expenses for integrative therapy. We categorized them as follows:

- Format for artifact
- Informational sources for integrated care
- How to introduce CIT to patients
- Specific instructions and examples for each modality
- Addresses time constraints of HCPs
- Out-of-pocket expenses for integrative therapy.

Applying the Literature and Evaluative Feedback for Development of the Key Components

From the literature review, we identified four key components (cost, safety, accessibility, and evidence-based) as inclusion criteria for our educational artifact, and four evidence-based CITs (aromatherapy, mindfulness meditation, relaxation and breathing techniques, and yoga) for the management of insomnia. Based on the literature, we chose three core components (modality

definition, modality summary of the research, and modality CIT Research Summaries) to include in the educational artifact. We created an educational artifact draft and emailed a pilot survey with attached educational artifact to two HCPs and make enhancements to both the survey and educational artifact after receiving their feedback. We emailed the revised survey with the revised educational artifact to 29 HCPs and received 14 surveys to include in our analysis. As a result of the data analysis, we identified six additional key components (format for artifact, informational sources for integrated care, how to introduce CIT to patients, specific instructions and examples for each modality, address time constraints of HCPs, and out-of-pocket expenses for integrative therapy) for the co-creation of an educational artifact. Together with HCPs, we conclude that the seventeen key components for an educational artifact include the following list:

- Cost of CIT
- Safety of CIT
- Access to CIT
- Evidence-based CIT research
- Aromatherapy
- Mindfulness meditation
- Relaxation and breathing techniques
- Yoga
- Modality definition
- Modality summary of the research
- Modality research summaries
- Format for artifact

- Informational sources for integrated care
- How to introduce CIT to patients
- Specific instructions and examples for each modality
- Addresses time constraints of HCPs
- Out-of-pocket expenses for integrative therapy

In the discussion chapter we synthesize the methods and results and address the research purpose of co-creating with HCPs an educational artifact that informs HCPs and their chronically ill patients about evidence-based complementary and integrative therapies (CIT) for insomnia management.

Discussion

The purpose of this chapter is to interpret our research findings. We begin with a review of the literature-supported findings. Next, we examine the unexpected findings from our research and discuss the implications for holistic health, the medical community, and future research. We conclude with a summary of our project.

Findings Supported by the Literature

The literature supports a number of our findings. In this section, we first consider provider interest and their willingness to recommend CIT for insomnia management, followed by the financial considerations for patients using CIT, and the unavailability of credentialed providers for integrative practices.

Provider interest and willingness to recommend CIT for insomnia. Consistent with the literature, HCPs in our survey are cognizant of CIT (Klimenko et al., 2006; Milden & Stokols 2004; Münstedt et al., 2011) and are interested in recommending it to their patients (Milden & Stokols, 2004; Smith et al, 2015). Bjerså et al. (2012) and Milden and Stokols (2004) acknowledge that CIT is gaining visibility and becoming more mainstream among patients and practitioners in allopathic healthcare. Increased provider interest in CIT confirms the importance of an accessible informational or educational artifact to bridge the gap from research to practice.

Financial considerations. In the evaluative feedback, the convenience sample of HCPs considers lack of reimbursement to be the most important factor affecting the integration of CIT into their practices. Although these findings cannot be generalized to the greater population of HCPs, this finding is also congruent with the literature. The literature cites out-of-pocket costs to patients as a consideration for the use of CIT by HCPs (Klimenko et al., 2006; Léger & Bayon,

2010) and corroborated by our survey results. Therefore, we address the barriers of financial considerations by selecting four modalities that represent cost effective strategies for the management of insomnia.

Unavailability of credentialed providers for integrative practices. Results from our study are consistent with the literature, which suggests that access to credentialed providers for CIT is a challenge for HCPs, and creates a referral barrier (Klimenko et al., 2006). The evaluative feedback frequently cites unavailability of credentialed providers as a factor that affects the use of CIT for insomnia. Referring a patient to a credentialed CIT practitioner takes the burden of professional responsibility off the HCP, while still allowing for what is in the best interest of the patient and their health (Chang et al., 2011; Halterman-Cox, Sierpina, Sadoski, & Sanders, 2009; Klimenko et al., 2006).

There is no national standard for credentialing integrative practitioners, and Minnesota currently does not require credentialing for holistic health practitioners or many integrative practitioners (National Center for Complementary and Integrative Health, 2016). The four modalities of aromatherapy, mindfulness meditation, relaxation and breathing techniques, and yoga are not dependent on a referral to a specialized integrative practitioner and therefore may be accessed without concerns of a referral barrier. However, a list of practitioners and access to informational websites is still needed to support the integration of CIT into HCPs practices

Content of an educational artifact. A principal outcome of the evaluative feedback from the expert panel of HCPs is to determine the specific information needed to support the assimilation of mind-body practices alongside evidence-based practice standards of allopathic medicine for the management of insomnia. Aromatherapy, mindfulness meditation, relaxation

and breathing techniques, and yoga are research-supported practices that preclude identified barriers from the literature and receive validation from the HCP sample in this research. Each of these modalities represents a strategy that patients may implement at home (accessible), has minimal to low out-of-pocket costs (cost constraints), is without risk of interactions with other medical treatments (interactions), and demonstrates efficacy for the management of insomnia. Because HCPs identified time as a barrier for implementing CIT for insomnia, making research-supported materials easily accessible to both HCP and patients is an important consideration for the content of the educational artifact. A web-based resource is an example of such an artifact, with specific examples of how to use the modalities, along with direct links to reliable websites, and is accessible for HCPs, efficiently linking effective CIT to insomnia management.

Research also supports the components of the educational artifact in which providers indicate interest and willingness to integrate CIT into a conventional medical practice (Klimenko et al., 2006; Milden & Stokols, 2004; Sierpina, 2004; Smith et al., 2015). Within the context of the critical paradigm, and with acknowledgement of the values of the researchers and participants, we collaborated with HCPs to develop the content of an educational artifact that addresses effective insomnia management by HCPs. Next, we discuss unexpected findings.

Unexpected Findings

The standard in healthcare is to use evidence-based practice, defined by Sackett, Rosenberg, Gray, Haynes, & Richardson (1996) as using the best scientific evidence for clinical practice decisions. We therefore anticipated that evidenced-based practice recommendations would be a priority for HCPs considering integration of CIT into a mainstream medical practice. This is not the case in our evaluative feedback; instead, lack of reimbursement was the single

most-cited factor that affects HCPs' consideration of recommending CIT. Our sample considered other elements as important including time constraints of an office visit and concern about the availability of credentialed CIT providers (Benca, 2005; Chang et al., 2011; Halterman-Cox et al., 2008; Klimenko et al., 2006; Milden & Stokols, 2004; Smith et al., 2015).

We surmise two conclusions from how our sample prioritized factors affecting their use of CIT for insomnia management. First, there is an increased awareness surrounding the benefits of CIT (Weise, Oster, & Pincombe, 2010), which gives it more credibility as another option for insomnia management. Second, our convenience sample, as our colleagues and acquaintances, are more likely than the general population to share an interest in holistic practices, and therefore may be more informed on CIT than the general population of HCPs. In conclusion, our small sample is in no way representative of the general population of HCPs.

Years of experience in practice are a determinant in how interested this sample of HCPs is in using CIT in their practice (Milden & Stokols, 2004). Milden and Stokols (2004) note a correlation to increased years of practice (in physicians) to greater resistance or indifference to CIT, possibly related to their strict positivist attitudes. A survey of medical students and HCPs also suggests that recent medical school graduates have had more education in CIT and therefore greater awareness of CIT (Halterman-Cox et al., 2008).

We anticipated the younger, or less experienced HCPs would be more willing to integrate CIT, but found that it was the older and more experienced HCPs who are either using CIT or willing to adopt CIT into practice. In our survey, participants with 20 years or more of practice experience are more interested in advising their patients about integrative practices for chronic insomnia than HCPs with 10 or fewer years' experience. We are intrigued and unsure how to

interpret this finding. This outcome may be linked to increased provider acceptance of CIT for insomnia and depression/anxiety disorders, which are considered mind-body diseases, and are difficult to treat with allopathic interventions (Barrows & Jacobs, 2002). We also anticipate that the HCPs with greater professional experience have more confidence stepping outside the norms of standard medical practice.

Despite yoga's widespread use in the United States and confirmed effectiveness by evidence-based research (Kennedy, 2014; Khalsa, 2004), we didn't expect that yoga was the modality least likely to be recommended for the management of insomnia. There are RCTs and quasi-experimental trials that link the benefits of yoga to insomnia management (Afonso et al., 2012; Cohen et al., 2004; Halpern et al., 2014; Hariprasad et al., 2013). In our opinion, yoga may be more culturally rooted as an exercise modality rather than a mind-body relaxation technique for insomnia. Thus, there is a disconnect between yoga as a research-supported therapeutic modality and yoga as a cultural phenomenon for a healthy lifestyle. Additionally, challenges may also exist with the accessibility of yoga, such as perceptions by HCPs and patients that yoga is best practiced at a studio with specially trained practitioners and requires an out-of-pocket financial commitment.

It is compelling that, of the four modalities, HCPs are most likely to recommend mindfulness meditation. There is considerable research connecting the benefits of mindfulness meditation to insomnia management, suggesting a movement of evidence-based practice standards of allopathic medicine closer to a holistic approach to improve the QOL of individuals. Despite the research results, the research team has not located references that identify HCPs' opinion or knowledge of specifically aligning the use of meditation over other modalities for

insomnia management.

Implications

There are several important implications from our research. In this section we consider the implications of our project in the field of holistic health and in the medical community. In closing, we suggest future research topics.

Holistic health. The results of our design and development research are important for holistic health because we have identified four effective modalities that meet the criteria of being safe, accessible, evidence-based, and with a low financial burden. Aromatherapy, mindfulness meditation, relaxation and breathing techniques, and yoga are viable applications that offer exciting new pathways to complement conventional treatments of insomnia (Chang et al., 2011; Neuendorf et al., 2015; Smith et al., 2015).

Informing holistic practitioners about the burden of insomnia and the importance of good sleep is important, especially in individuals with chronic disease where non-pharmacologic interventions may be beneficial without adding to the burden of medication side effects. The mind-body-spirit approach to wellness is well established. Connecting CIT modalities with insomnia management is the next step. We need to initiate communication and education about insomnia, healthy sleep, the benefits and risks associated with pharmacological interventions, and the effectiveness of CIT. Information dissemination should include targeting professional holistic organizations, health newsletters, academic conferences, and local community events.

Although this research focused on HCPs, it is also time to address the benefits of CIT for insomnia with the general population. There is greater awareness that insomnia is a prevalent health burden, and research supports the link between chronic conditions, QOL, and sleep. HCPs

in general have underused CIT as a tool for insomnia management; therefore, dissemination of information is key. Education about the benefits of CIT for sleep begins as a grassroots effort at community centers, yoga studios, food co-ops, in the schools, childcare centers, senior centers, and with holistic practitioners.

Medical community. There continues to be ongoing research acknowledging the importance of understanding the role that CIT may play within mainstream medicine (Pearson & Chesney, 2007), yet HCPs are not well informed about the research-supported integrative practices for the management of insomnia (Chang et al., 2011; Milden & Stokols, 2004). We discern a disconnect between research supported CIT for insomnia and HCPs' lack of knowledge about effective CIT strategies for insomnia management. In order to improve the support of practitioners in primary medical clinics, there needs to be a logical, organized, and accessible means for HCPs to access tools, information, and referral sources for integrative modalities in the management of insomnia. Therefore, we propose a balanced care model (see key components in results) that supports holistic and conventional practice as both timely and realistic. As CIT providers, we need to work on system and policy changes to increase CIT insurance reimbursement. We also need to make CIT providers more accessible and develop partnerships with healthcare companies. Licensure or standard credentialing may improve reimbursement for integrative therapies and provide more credibility and visibility for integrative modalities (Herman & Coulter, 2016).

The financial concerns of HCPs for their patients are particularly relevant in the current political arena as healthcare costs are becoming more burdensome to American families (DiJulio, Kirzinger, Wu, & Brodie, 2017). The widespread debate on controlling healthcare expenditures

has elevated an awareness of the financial burden associated with medical care. It is within this context that our research has important implications for the management of insomnia. We have identified four evidence-based modalities that are useful for the management of chronic insomnia with minimal financial impact and that allow more patient control over their health.

Addressing insomnia management for health maintenance is imperative because sleep is essential for healing the body and mind, but unfortunately, up to 80% of the chronically ill experience some degree of insomnia (Pearson et al., 2006, Sorscher, 2008). The curriculum of all healthcare providers needs to include basic insomnia education, including medical schools, nursing schools, social workers, and psychologists. There is a need to improve patient care and QOL by improving access to informed holistic providers and databases that support the integration of CIT into mainstream medicine.

Future research

In this section, we describe the various opportunities to strengthen future research based on the retrospective analysis of our study. We look at the limitations in our design and consider an alternative design for research.

Random-controlled studies are needed to further define the effects of CIT on insomnia and how HCPs can use various therapies in combination to improve insomnia management. A longitudinal study that follows the benefits of CIT modalities in insomnia patients with chronic disease with or without the use of pharmacology or CBT-I would help further delineate the effectiveness for CIT in chronic insomnia. More studies are required to develop a stronger base of reliable information to promote CIT use among conventional medical providers. Publications in peer-reviewed professional journals give CIT more credibility within the medical community.

A different research design could also ferret out more information from HCPs and clients. For example, the use of participatory action research could result in meaningful collaboration between integrative practitioners and medical providers to weave together the strengths of two paradigms of healthcare, providing us with more direct access to patient care and CIT education for HCPs. Holistic care is on the precipice of engaging the medical community in holism as another approach to healthcare. Our excitement and experience as Master's prepared students provide us with the directive to educate and inform both HCPs and patients.

Conclusion

Insomnia affects health and is especially prevalent in individuals with chronic diseases (Foley et al., 2004; Katz & McHorney, 2002; Liu et al., 2013; Roth, 2009). HCPs do not routinely address insomnia until it becomes a significant health problem (Benca, 2005; Milden & Stokols, 2004; Saddichha, 2010; Schutte-Rodin et al., 2008; Shahid et al., 2012; Sorscher, 2008). Current insomnia management includes pharmaceuticals and CBT-I (Benca, 2005; Pearson et al., 2006; Saddichha, 2010; Shahid et al., 2012). Pharmaceuticals are not intended for long-term management (Benca, 2005; Saddichha, 2010; Schutte-Rodin et al., 2008; Vyas, 2013). CBT-I is not readily accessible and requires a high degree of compliance to be successful (Mitchell et al., 2012). Despite the strength of research supporting CIT for managing insomnia and HCP interest in CIT in the US, pharmaceuticals are primarily used for insomnia management (Shahid et al., 2012).

Using a critical paradigm, this design and develop methodology establishes the best content and preferred format of an educational artifact model for CIT for the management of insomnia in individuals with chronic conditions. The key components of the educational artifact

address the challenges of managing insomnia in chronic conditions. The chronically ill make more visits to HCPs, spend more money on pharmaceuticals, and there are greater concerns for drug interactions with insomnia medications due to the sedating effects (Benca, 2005; Foley et al., 2004; Roth, 2009). Therefore, the four CIT evidence-based modalities of aromatherapy, mindfulness meditation, relaxation and breathing techniques, and yoga we selected for this research represent safe, affordable, accessible, and evidence-based practices, which are congruent with the needs of the chronically ill.

The literature suggests there is an increased awareness of the benefits of CIT for the management of many health issues including insomnia (Chan et al., 2014; Cueller et al., 2007; de Niet et al., 2009; Dzierzewski et al., 2014; Gooneratne, 2008; Gross et al., 2011; Halpern et al., 2014; Sarris & Byrne, 2011; Weise et al. 2010). Informing HCPs of holistic options and how to approach and empower their patients with these options for self-efficacy is now the challenge. The key to developing a balanced, integrated healthcare model for insomnia is education of HCPs regarding effective CIT modalities (Sierpina, 2004). Our design and development research confirms that an educational artifact is advantageous, timely, and raises the awareness of the application of CIT for the management of chronic insomnia in individuals with chronic conditions.

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Appendix A

Sleep Term Definitions

Term	Definition
Chronic insomnia	Inadequate quantity or quality of sleep characterized by a subjective report of difficulty with sleep initiation, duration, consolidation, or quality that occurs despite adequate opportunity for sleep, and that results in some form of daytime impairment and has persisted for at least one month
Deep restorative cycles of sleep	6-9 hours of uninterrupted sleep which includes all the sleep stages
Healthy sleep	6-9 hours of uninterrupted sleep which includes all the sleep stages
Insomnia	A disorder characterized by inability to sleep or a total lack of sleep
non-Rapid Eye Movement (non-REM) sleep	Stages N1, N2, and N3 sleep
Objective versus subjective sleep	Measurable sleep by use of a polysomnogram (objective) versus how the person reports sleep (subjective)
Polysomnography	A test used to diagnose sleep disorders. Polysomnography records brain waves, the blood oxygen level, heart rate and breathing, as well as eye and leg movements
Rapid Eye Movement (REM) Sleep	Rapid eye movement sleep, the stage of sleep with the highest brain activity, characterized by enhanced brain metabolism and vivid hallucinatory imagery or dreaming, also called “paradoxical sleep”, and associated with fast eye movements
Rebound insomnia	Occurs after a patient stops taking the sleep medication which typically causes 1 - 2 nights up to 1 - 2 weeks of sleep disturbance, daytime sleepiness, and anxiety as well as a temporary worsening of long-term insomnia

Short-term sleep management	Treatments for non-chronic insomnia
Sleep architecture	The basic structural organization of normal sleep
Sleep deprivation	The situation or condition of suffering from a lack of sleep
Sleep disorders and dysfunctions	Problems with sleeping include trouble falling or staying asleep, falling asleep at the wrong times, too much sleep, and abnormal behaviors during sleep
Sleep disturbances	Disorders of initiating and maintaining sleep (DIMS), disorders of excessive somnolence (DOES), disorders of sleep–wake schedule, and dysfunctions associated with sleep, sleep stages, or partial arousals (parasomnias)
Sleep Efficiency	The ratio of total time spent asleep (total sleep time) in an sleep period to the total amount of time spent in bed
Sleep Hygiene	A variety of different practices and habits that are necessary to have good sleep quality and full alertness; including regular bedtime and risetime, limited caffeine, and establishing a bedtime ritual
Sleep latency	The duration of time from “lights out,” or bedtime, to the onset of sleep
Sleep maintenance	The ability to stay asleep once asleep
Subjective sleep quality	One's perception that they fall asleep easily or with difficulty, get sufficient duration so as to wake up feeling rested or not enough sleep to feel rested, and can make it through their day without experiencing excessive daytime sleepiness (EDS) or have impairments due to EDS
Sleep Rebound	The lengthening and increasing frequency and depth of sleep which occurs after periods of sleep deprivation
Sleep time	How much sleep is acquired in a given time
Slow Wave Sleep (SWS)	Also called deep sleep or N3, the deepest stage of sleep where it is believed most brain restoration happens as well as hormone secretion such as growth hormone

Stage N3 sleep	Also called slow wave sleep, approximately 20% of an adults sleep period
Wake after sleep onset (WASO)	How much time is spent awake after sleep onset

Resources used for definitions:

Sleep Terms, Definitions and Abbreviations. (n.d.). Retrieved from <http://www.sleepnet.com/definition.html>

National Sleep Foundation. (2016). *Sleeptionary - definitions of common sleep terms*. Retrieved from <https://sleepfoundation.org/sleeptionary>

Appendix B

Email Introduction

Dear Healthcare Provider:

You are invited to participate in a research study. As an experienced healthcare provider, we are interested in your opinion and content expertise. We are conducting a survey regarding Complementary and Integrative Therapies (CIT) and your input will be used to format the content of an educational artifact on CIT for the management of chronic insomnia. Our Master's research thesis title is "Complementary and Integrative Therapies for the Management of Insomnia in Chronic Disease." The results of the study will benefit providers and patients by facilitating the application of research results to patient care.

We request that you forward this email and the survey link provided to other healthcare providers who manage individuals with chronic insomnia and chronic disease. We welcome the input of physicians, nurse practitioners, physician assistants, and mental health therapists.

Please respond to each question based on how you presently feel about the subject. Participation in this study is voluntary and implies consent. If you decide not to complete this survey, feel free to withdraw at any time. The research team will not have any information about which providers in the convenience sample decide to participate. Your responses will be confidential. A password protected computer will store the data results. The IP addresses will not be collected with returned surveys. Only the research team and the research advisors will have access to the data in the analysis process. The data will be destroyed in July 1, 2017, after completion of the final project.

The survey should take 10-15 minutes.

Click on the link to view the educational resource and complete the survey.

Follow this link to the Survey:

Take the survey

Or copy and paste the URL below into your internet browser:

http://stkate.az1.qualtrics.com/SE?SID=SV_4JcSfmIGFS9K6jP&Q_CHL=preview&Preview=Survey

Follow the link to opt out of future emails:

Click here to unsubscribe

Thank you.

Research Team Members,

Nicole Anderson, BA, CITI Training, Qualtrics Training

Elisabeth Benson, RN, BSN, PHN, CITI Training, Qualtrics Training

Mary McKinley, R.EEG T., RPSGT, RST, BA, CH, CITI Training

Juliana Sayner, RN, BSN, OCN, CITI Training, Qualtrics Training

St Catherine University

Masters of Holistic Health Studies

St Paul, MN, 55116

Appendix C

Pilot Survey

CIT for the Management of Chronic Insomnia Survey

Please review the “*Educational Resource*” listed below in [blue](#). The educational resource includes three sections. The first two sections are in a document containing modality definitions and summaries of the research for four integrative modalities. Scrolling down, you will find a document including the final section, which is a chart of evidence-based research studies on the four integrative modalities.

After reviewing the documents, close the *Educational Resource* and continue to the survey by clicking on the [coral box](#).

Thank you.

[Educational Resource](#)

Please respond to the following questions.

Q1 What are your intentions about the utilization of integrative practices for the management of chronic insomnia? Select one response.

(Multiple choice response)

- (1) I would like to be able to advise patients about commonly used integrative practices for chronic insomnia.
- (2) I currently advise my patients about commonly used integrative practices for chronic insomnia.
- (3) I am not interested in advising my patients about integrative practices for chronic insomnia

Q2 Do the modality definitions provide adequate support for the use of these four integrative practices within a conventional medical practice?

(Slider response: 0=Not Supportive 10=Very Supportive)

- (1) Relaxation and Breathing Techniques
- (2) Yoga
- (3) Mindfulness Meditation
- (4) Aromatherapy

Q3 Do the modality summaries of the research provide adequate support for the use of these four integrative practices within a conventional medical practice?

(Slider response: 0=Not Supportive 10=Very Supportive)

- (1) Relaxation and Breathing Techniques
- (2) Yoga
- (3) Mindfulness Meditation
- (4) Aromatherapy

Q4 After reviewing this educational resource, how likely are you to recommend each of the four modalities to assist in the management of chronic insomnia?

(Slider response: 0=Not Likely 10=Very Likely)

- (1) Relaxation and Breathing techniques
- (2) Yoga
- (3) Mindfulness meditation
- (4) Aromatherapy

Q5 What additional content could strengthen the usability of the educational resource?
Be specific. (Text entry response)

Q6 What sources do you currently use to obtain information about integrative care for patients?
Be specific. (Text entry response)

Q7 What format would be most useful as a resource about integrative modalities?

(Multiple choice response)

- (1) Website
- (2) An App
- (3) Brochure

We are interested in your opinion on integrating CIT into your practice.

Q8 Drag the following factors, in order of priority, on how they impact integrating CIT into your

practice for the management of chronic insomnia.

(Rank order response: 1= greatest impact affecting my integration of CIT
6=least impact affecting my integration of CIT)

- (1) Lack of evidence for practice
- (2) Unavailability of credentialed providers for integrative practices
- (3) Lack of reimbursement
- (4) Too time consuming
- (5) Outside the accepted professional norm
- (6) Don't know where to access information about evidence-based practices

Q9 Any additional comments, please list below. If not, please write "no" below to proceed.

(Text entry response)

Please answer a few questions on demographics.

Q10 What professional title is most relevant to your current practice in healthcare?

(Multiple choice response)

- (1) Physician
- (2) Physician Assistant
- (3) Nurse Practitioner
- (4) Therapist
- (5) Sleep Medicine Specialist
- (6) Other

Q11 How many years have you been in practice?

(Multiple choice response)

- (1) 0-10 years
- (2) 11-20 years
- (3) 21-30 years
- (4) 31-40 years
- (5) More than 40 years

Q12 What is your age?

(Multiple choice response)

- (1) Under 30 years old
- (2) 31-40 years old

- (3) 41-50 years old
- (4) 51-60 years old
- (5) Over 60 years old

Q13 What is your gender?

(Multiple choice response)

- (1) Male
- (2) Female

Appendix D

Survey

CIT for the Management of Chronic Insomnia Survey

There are four integrative techniques for the management of chronic insomnia included in our survey. The techniques are aromatherapy, mindfulness meditation, relaxation and breathing techniques, and yoga.

There are two steps to complete the survey.

First, you will read a definition and summary of the research for each technique. Following the summaries, we have also included the CIT Research Summaries. This is our educational resource (listed below in blue).

Second, you will complete a survey about the information provided in the educational resource.

After reviewing the information, close the educational resource and continue to the survey by clicking on the coral box in the lower right-hand corner of this page.

Thank you.

[Educational resource](#)

Please respond to the following questions.

Q1 Do the definitions provide adequate support for the use of these four integrative practices within a conventional medical practice?

(Slider response: 0=Not Supportive 10=Very Supportive)

- (1) Relaxation and Breathing Techniques
- (2) Yoga
- (3) Mindfulness Meditation
- (4) Aromatherapy

Q2 Do the summaries of the research provide adequate support for the use of these four integrative practices within a conventional medical practice?

(Slider response: 0=Not Supportive 10=Very Supportive)

- (1) Relaxation and Breathing Techniques
- (2) Yoga

- (3) Mindfulness Meditation
- (4) Aromatherapy

Q3 After reviewing this educational resource, how likely are you to recommend each of the four modalities to assist in the management of chronic insomnia?

(Slider response: 0=Not Likely 10=Very Likely)

- (1) Relaxation and Breathing techniques
- (2) Yoga
- (3) Mindfulness meditation
- (4) Aromatherapy

Q4 What additional content could strengthen the usability of the educational resource?
Be specific.

(Text entry response)

Q5 What sources do you currently use to obtain information about integrative care for patients?
Be specific.

(Text entry response)

Q6 What format would be most useful as a resource about integrative modalities?

(Multiple choice response)

- (1) Website
- (2) An App
- (3) Brochure

We are interested in your opinion on integrating CIT into your practice.

Q7 Drag the following factors, in order of priority, on how they impact integrating CIT into your practice for the management of chronic insomnia.

(Rank order response: 1= greatest impact affecting my integration of CIT
6=least impact affecting my integration of CIT)

- (1) Lack of evidence for practice
- (2) Unavailability of credentialed providers for integrative practices
- (3) Lack of reimbursement
- (4) Too time consuming
- (5) Outside the accepted professional norm

(6) Don't know where to access information about evidence-based practices

Q8 What are your intentions about the utilization of integrative practices for the management of chronic insomnia? Select one response.

(Multiple choice response)

(1) I would like to be able to advise patients about commonly used integrative practices for chronic insomnia.

(2) I currently advise my patients about commonly used integrative practices for chronic insomnia.

(3) I am not interested in advising my patients about integrative practices for chronic insomnia

Q9 Any additional comments, please list below. If not, please write "no" below to proceed.

(Text entry response)

Please answer a few questions on demographics.

Q10 What professional title is most relevant to your current practice in healthcare?

(Multiple choice response)

(1) Physician

(2) Physician Assistant

(3) Nurse Practitioner

(4) Therapist

(5) Sleep Medicine Specialist

(6) Other

Q11 How many years have you been in practice?

(Multiple choice response)

(1) 0-10 years

(2) 11-20 years

(3) 21-30 years

(4) 31-40 years

(5) More than 40 years

Q12 What is your age?

(Multiple choice response)

(1) Under 30 years old

- (2) 31-40 years old
- (3) 41-50 years old
- (4) 51-60 years old
- (5) Over 60 years old

Q13 What is your gender?

(Multiple choice response)

- (1) Male
- (2) Female

Appendix E

Educational Artifact

Definitions and Summaries of the Research

Aromatherapy

Definition: Aromatherapy is the use of selected essential oils with the general goal of improving health and well-being. Essential oils interact on an emotional, energetic and biochemical level.

Aromatherapy is defined by The National Association for Holistic Aromatherapy [NAHA] as “the art and science of utilizing naturally extracted aromatic essences from plants to balance, harmonize and promote the health of body, mind and spirit.”

Summary of the Research: A meta-analysis of twelve RCTs and quasi-experimental aromatherapy studies definitively link aromatherapy to improved physical health (improved sleep, improved fatigue), psychological health (decreased depression, improved anxiety), and improved pain. Results of a second systematic review of fifteen quantitative studies evaluating inhalation aromatherapy effects on sleep disturbances, demonstrate improved sleep outcomes, without adverse effects. The biochemical components found in essential oils, such as esters, acids, coumarins and monoterpenoids generate hypnotic, antianxiety, and sedative effects. Essential oils may be used as monotherapy or in conjunction with other CIT and conventional modalities. Lavender, chamomile, bergamot, cypress lavender, peppermint and jasmine are the oils studied in each of the systematic reviews.

Dyer, J., Cleary, L., McNeill, S., Ragsdale-Lowe, M., & Osland, C. (2016). The use of aromasticks to help with sleep problems: A patient experience survey. *Complementary Therapies in Clinical Practice*, 22, 51-58. <http://dx.doi.org/10.1016/j.ctcp.2015.12.006>

Hajibagheri, A., Babaii, A., & Adib-Hajbaghery, M. (2014). Effect of *Rosa damascene* aromatherapy on sleep quality in cardiac patients: A randomized controlled trail. *Complementary Therapies in Clinical Practice*, 20(3), 159-163. <http://dx.doi.org/10.1016/j.ctcp.2014.05.001>

Johannessen, B. (2013). Nurses experience of aromatherapy use with dementia patients experiencing disturbed sleep patterns: An action research project. *Complementary Therapies in Clinical Practice*, 19(4), 209. <http://dx.doi.org/10.1016/j.ctcp.2013.01.00>

Mindfulness Meditation

Definition: Mindfulness meditation (MM) is a research-based, non-sectarian, Western form of meditation that comes from a 2,500-year-old Buddhist practice called Vipassana or Insight Meditation. It is a form of meditation designed to develop the skill of paying attention to our inner and outer experiences with acceptance, patience, and compassion. Mindfulness meditation is a mind-calming practice that focuses on breathing and awareness of the present moment and has been shown to improve overall sleep onset and continuity.

Summary of the Research: The relaxation response of MM is a deep physiological shift in the body that counters the stress response. The relaxation response can help ease many stress-related ailments, including depression, pain, high blood pressure as well as insomnia.

Mindfulness is effective for chronic insomnia in combination with CBT-I and as a stand-alone therapy. MM teaches non-judgmental awareness of thoughts to decrease negative sleep patterns. A significant improvement in sleep measures of total wake time, and sleep efficiency is measured by sleep diaries and the pre-sleep arousal scale. The studies reviewed suggest MM improves symptoms of insomnia as adjunct or alternative to pharmacology. The initial instruction may be provided by a trained practitioner, although there are also free apps and websites available for guided meditation.

Jain, S., & Shapiro, G. (2013). Introducing insomnia meditation therapy: A novel behavioural intervention for insomnia. *Sleep Medicine, 14*(Suppl.1), e158.

<http://dx.doi.org/10.1016/j.sleep.2013.11.364>

Ong, J., & Sholtes, D. (2010). A mindfulness-based approach to the treatment of insomnia.

Journal of Clinical Psychology, 66(11), 1175-1184.

<http://dx.doi.org/10.1002/jclp.20736>

Ong, J. C., Manber, R., Segal, Z., Xia, Y., Shapiro, S., & Wyatt, J. K. (2014). A randomized controlled trial of mindfulness meditation for chronic insomnia. *Sleep*, 37(9), 1553.

<http://dx.doi.org/10.5665/sleep.4010>

Sun, J., Kang, J., Wang, P., & Zeng, H. (2013). Self-relaxation training can improve sleep quality and cognitive functions in the older adult: A one-year randomized controlled trial. *Journal of Clinical Nursing*, 22(9-10), 1270-1280.

<http://dx.doi.org/10.1111/jocn.12096>

Relaxation and Breathing Techniques

Definition: Intentional action using slow and controlled respiration and focal muscle relaxation, to reduce muscle tension, induce a quiet body response, and slow the activity of the brain.

Summary of the Research: Although there is evidence-based research that supports relaxation techniques as a single modality, relaxation techniques have most often studied as an adjunct with other integrative mind/body modalities. The controlled respiratory rate of 10 seconds per breath cycle (inhalation plus exhalation) is more likely to slow sympathetic nervous system response.

Research results also indicate that focused breathing and relaxation techniques decrease cortisol levels, suggesting a reduction in the stress response to emotional and physiological

triggers. Sleep hygiene, stimulus control along with relaxation and breath techniques have shown to improve time to fall asleep and sleep maintenance modestly. Because of the simplicity of this modality, compliance is less likely to be a problem. Relaxation and Breathing techniques are easily completed at home and associated with little to no cost. Appropriate medical assessment suggested before recommending in individuals with underlying pulmonary disease.

Konsta, A., Dikeos, D., Bonakis, A., Economou, N., Chrousos, G., & Darviri, C. (2013). Stress management techniques in primary insomnia: A randomized controlled trial. *Sleep Medicine, 14*, e173. <http://dx.doi:10.1016/j.sleep.2013.11.405>

Pallesen, S., Nordhus, I. H., Kvale, G., Nielsen, G. H., Havik, O. E., Johnsen, B. H., & Skjøtskift, S. (2003). Behavioral treatment of insomnia in older adults: An open clinical trial comparing two interventions. *Behaviour Research and Therapy, 41*(1), 31-48. [http://dx.doi:10.1016/S0005-7967\(01\)00122-X](http://dx.doi:10.1016/S0005-7967(01)00122-X)

Tsai, H. J., Kuo, T. B. J., Lee, G., & Yang, C. C. H. (2015). Efficacy of paced breathing for insomnia: Enhances vagal activity and improves sleep quality: Paced breathing and insomnia. *Psychophysiology*, 52(3), 388-396. <http://dx.doi:10.1111/psyp.12333>

Waters, W. F., Hurry, M. J., Binks, P. G., Carney, C. E., Lajos, L. E., Fuller, K. H., . . . Tucci, J. M. (2003). Behavioral and hypnotic treatments for insomnia subtypes. *Behavioral Sleep Medicine*, 1(2), 81-101. http://dx.doi:10.1207/S15402010BSM0102_2

Yoga

Definition: Yoga is an ancient Indian philosophy which seeks to balance the body, mind, and spirit. In Sanskrit, yoga means union. It uses techniques of regulated breathing (pranayamas) combined with postures (asanas) that are fluid and move gently from one to the next. The use of the breath helps to connect the movements, to enhance relaxation, and improve mental calmness and clarity. Yoga postures improve circulation, and strengthen the body. The meditative techniques of yoga (dhyana) help to connect practitioners to the world as a whole, which is the spiritual quality of yoga.

Summary of the Research: There is considerable research on yoga for insomnia, but due to the many different types of yoga, it is difficult to generalize results. Evidence-based studies link health benefits to the practice of yoga with insomnia through a diminished stress response, including decreased blood pressure, respiratory and heart rate. Researchers demonstrate improvements in total sleep time, sleep latency, decreased wake time after sleep onset, improved sleep efficiency, and improved QOL. To achieve the full benefits of this modality, a certified yoga instructor can provide initial instruction for the movements and breathing techniques. The initial guidance reduces the potential for injury and improves practice compliance. Yoga is an effective and safe intervention for persons with chronic diseases since it is adaptable to all levels of ability.

Afonso, R. F., Hachul, H., Kozasa, E. H., Oliveira, D. S., Goto, V., Rodrigues, D., & ... Leite, J. (2012). Yoga decreases insomnia in postmenopausal women: A randomized clinical trial. *Menopause, 19*(2), 186-193. <http://dx.doi.org/10.1097/gme.0b013e318228225f>

- Cohen, L., Warneke, C., Fouladi, R. T., Rodriguez, M. A., & Chaoul-Reich, A. (2004). Psychological adjustment and sleep quality in a randomized trial of the effects of a Tibetan yoga intervention in patients with lymphoma. *Cancer, 100*(10), 2253–2260. <http://dx.doi.org/10.1002/cncr.20236>
- Hariprasad, V. R., Sivakumar, P. T., Koparde, V., Varambally, S., Thirthalli, J., Varghese, M., . . . Gangadhar, B. N. (2013). Effects of yoga intervention on sleep and quality-of-life in elderly: A randomized controlled trial. *Indian Journal of Psychiatry, 55*(Suppl. 3), S364-S368. <http://dx.doi.org/10.4103/0019-5545.116310>
- Halpern, J., Cohen, M., Kennedy, G., Reece, J., Cahan, C., & Baharav, A. (2014). Yoga for improving sleep quality and quality of life for older adults. *Alternative Therapies in Health and Medicine, 20*(3), 37-46. Retrieved from <http://www.alternative-therapies.com>
- Khalsa, S. B. S. (2004). Treatment of chronic insomnia with yoga: A preliminary study with sleep–wake diaries. *Applied Psychophysiology and Biofeedback, 29*(4), 269-278. <http://dx.doi.org/10.1007/s10484-004-0387-0>
- Manjunath, N.K., & Telles, S. (2005). Influence of yoga & Ayurveda on self-rated sleep in a geriatric population. *Indian Journal of Medical Research, 121*(5), 683-690. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/15937373>

Appendix F

CIT Research Summaries

Modality	Citation	Variable	Sample Size	Abstract	Effectiveness
Aromatherapy	Dyer, J., Cleary, L., McNeill, S., Ragsdale-Lowe, M., & Osland, C. (2016). The use of aromasticks to help with sleep problems: A patient experience survey. <i>Complementary Therapies in Clinical Practice</i> , 22, 51-58. http://dx.doi.org/10.1016/j.ctcp.2015.12.006	The blends used in this study represented a typical selection of essential oils for sleep. Blend A is bergamot (<i>Citrus bergamia</i>) and sandalwood (<i>Santalum austrocaladonicum</i>); blend B is frankincense (<i>Boswellia carterii</i>), mandarin (<i>Citrus reticulata</i>) and lavender (<i>Lavandula angustifolia</i>); blend C is a proprietary blend sold for "sleep" containing orange sweet (<i>Citrus sinensis</i>), petitgrain (<i>Citrus aurantium</i>), lavandin (<i>Lavandula hybrida</i>), mandarin (<i>Citrus reticulata</i>), bergamot (<i>Citrus bergamia</i>), lavender (<i>Lavandula angustifolia</i>) and Roman chamomile (<i>Anthemis nobilis</i>).	N=59 adults with cancer	A prospective audit of aromasticks given to help facilitate sleep. Sixty-five aromasticks were given out over a 13 week period. Bergamot (<i>Citrus bergamia</i>), sandalwood (<i>Santalum austrocaladonicum</i>), frankincense (<i>Boswellia carterii</i>), mandarin (<i>Citrus reticulata</i>), and lavender (<i>Lavandula angustifolia</i>) were the essential oils used in the two blends chosen by patients.	94% of patients reported that they did use their aromastick to help them sleep and 92% reported that they would continue to do so. An improvement of at least one point on a Likert scale measuring sleep quality was shown by 64% of patients following the use of an aromastick. Thirtyseven patients (57%) initially reported problems getting off to sleep and 51 patients (91%) reported problems getting back to sleep, with "anxiety, worry, busy mind" (reported by 46 patients, 71%) and "pain/discomfort" (reported by 37 patients, 57%) being the reasons most often chosen.
Aromatherapy	Johannessen, B. (2013). Nurses experience of aromatherapy use with dementia patients experiencing disturbed sleep patterns. An action research project. <i>Complementary Therapies in Clinical Practice</i> , 19(4), 209. http://dx.doi.org/10.1016/j.ctcp.2013.01.00	<i>Lavender angustifolia</i> essential oil was diffused nightly.	N=24 residents N=12 nurses	The purpose of this action research study was to gain insight into nurses' experiences of incorporating aromatherapy into the care of residents suffering from dementia, anxiety and disturbed sleep patterns from four nursing homes. Nurses experienced some negative attitudes because of lack of evidence for practice for aromatherapy use from colleagues.	Nurses found that lavender had a positive effect on residents. Those on night shift observed fewer residents wandering or irritable and several slept well. Nurses on morning duty found that these residents were more alert and improved in mood. For a minority of residents, the effect of lavender was only slightly noticeable.

Aromatherapy	Hajibagheri, A., Babaii, A., & Adib-Hajbaghery, M. (2014). Effect of <i>Rosa damascene</i> aromatheapy on sleep quality in cardiac patients: A randomized controlled trial. <i>Complementary Therapies in Clinical Practice, 20</i> (3), 159-163. http://dx.doi.org/10.1016/j.ctcp.2014.05.001	Two groups: one control group with environmental control (such as sound and light), and second with environmental control along with aromatherapy.	N=60	Randomized controlled trial using a convenience sample allocated to the experimental or control groups. Patients in the control group received routine care. In the experimental group, patients received routine care and <i>Rosa damascene</i> aromatherapy for three subsequent nights. Sleep quality was assessed using the Pittsburgh Sleep Quality Index.	<i>Rosa damascene</i> aromatherapy can significantly improve the sleep quality of patients hospitalized in CCUs.
Mindfulness Meditation	Jain, S., & Shapiro, G. (2013). Introducing insomnia meditation therapy: A novel behavioural intervention for insomnia. <i>Sleep Medicine, 14</i> , e158. http://dx.doi.org/10.1016/j.slee.2013.11.364	Insomnia Meditation Therapy (IMT) evaluated using AIS and PSQI.	N=34	Three instructional sessions of insomnia meditation therapy (IMT) in a group format over the course of a month. Each session lasted 45 min and incrementally taught breathing exercises, a technique of meditative imagery (MI) and a non-judgmental awareness (NJA) meditation. Participants were asked to practice once during the day and immediately prior to bedtime for 20–30 min each time. The impact of IMT was assessed by validated questionnaires, AIS and PSQI. In addition the seven components of the PSQI were independently evaluated to determine which aspect of sleep quality improved.	Compared to the other major meditation therapy developed to date (MBT-I), IMT is easier to teach and learn, less time invasive and less demanding for the practitioner and professional, produces a palpable reaction during the first session and has demonstrated improved nocturnal sleep and daytime function at 3–4 weeks post introduction. It can be used in conjunction with other behavior and pharmaceutical treatments.
Mindfulness Meditation	Ong, J. C., Manber, R., Segal, Z., Xia, Y., Shapiro, S., & Wyatt, J. K. (2014). A randomized controlled trial of mindfulness meditation for chronic insomnia. <i>Sleep, 37</i> (9), 1553. http://dx.doi.org/10.5665/sleep.4010	Mindfulness based stress reduction v. mindfulness based therapy for insomnia v. self-monitoring.	N=54	Participants were randomized to either mindfulness-based stress reduction (MBSR), mindfulness-based therapy for insomnia (MBTI), or an eight-week self-monitoring (SM) condition.	Mindfulness meditation had positive patient reported benefits and appears to be a viable treatment option for adults with chronic insomnia. Mindfulness meditation may provide an alternative to traditional treatments for insomnia.

Mindfulness Meditation	Ong, J., & Sholtes, D. (2010). A mindfulness-based approach to the treatment of insomnia. <i>Journal of Clinical Psychology</i> , 66(11), 1175-1184. http://dx.doi.org/10.1002/jclp.20736	Case study applying behavioral treatments to mindfulness meditation for the management of insomnia	N=1	Mindfulness-based therapy for insomnia includes reducing unwanted wakefulness at night and effectively managing the emotional reactions to sleep disturbance and daytime fatigue. As the program progresses, the participant is taught to use mindfulness principles and behavioral strategies to work with these undesirable states. Using awareness as a platform, the participant is taught to respond to sleep disturbance with mindfulness skills rather than react automatically by increasing effort to rest. For example, awareness of internal cues (sleepiness rather than fatigue) along with a recognition of reactive tendencies (avoid fatigue by going to bed) is used to make changes in both the relationship to sleep and behaviors that are likely to promote sleep.	This case study adds to the growing body of evidence supporting the use of a mindfulness-based approach for the treatment of insomnia. Limitations include no control group and lack of specificity of treatment mechanisms.
Mindfulness Meditation	Sun, J., Kang, J., Wang, P., & Zeng, H. (2013). Self-relaxation training can improve sleep quality and cognitive functions in the older adult: A one-year randomized controlled trial. <i>Journal of Clinical Nursing</i> , 22(9-10), 1270-1280. http://dx.doi.org/0.1111/jocn.12096	Experimental group received self-relaxation training including progressive muscle relaxation and meditation Control group received sleep hygiene education only.	N=80 older adults	Randomly assigned to experimental (n = 40) or control (n = 40) group. Subjects in the experimental group received self-relaxation training including progressive muscle relaxation and meditation based on sleep hygiene education, while the control group received sleep hygiene education only.	The results of this study indicate that older adults may benefit from self-relaxation training in terms of improved sleep quality as well as cognitive functions. In practice, healthcare professionals can encourage older adults to take self-relaxation training as an alternative self-care skill, enabling them to improve sleep quality and cognitive functions.
Relaxation and Breathing Techniques	Tsai, H. J., Kuo, T. B. J., Lee, G., & Yang, C. C. H. (2015). Efficacy of paced breathing for insomnia: Enhances vagal activity and improves sleep quality: Paced breathing and insomnia. <i>Psychophysiology</i> , 52(3), 388-396. http://dx.doi.org/10.1111/psyp.12333	14 good sleepers and 14 self-reported insomniacs	N=28	Breathing at a rate of 10 seconds per breath cycle is important (not 5 seconds per breath). Slower measured relaxation breathing has the potential to slow the activity of the sympathetic nervous system.	Slow paced breathing for 20 minutes at night significantly reduced wake after sleep onset, the number of awakenings a night and time it takes to fall asleep.

Relaxation and Breathing Techniques	Konsta, A., Dikeos, D., Bonakis, A., Economou, N., Chrousos, G., & Darviri, C. (2013). Stress management techniques in primary insomnia: A randomized controlled trial. <i>Sleep Medicine, 14</i> , e173. http://dx.doi.org/10.1016/j.sleep.2013.11.405	Relaxation breathing, progressive muscle relaxation and guided imagery twice a day or a control condition	N=53 adults over 60 years old	Random-controlled trial; Intervention group included CD based program with relaxation breathing, guided imagery and muscle relaxation. Baseline data reported insomnia and quality of sleep, assessment for depression and anxiety, perceived stress and measurements of saliva cortisol levels. Assessment repeated at 4 weeks and 8 weeks. At the end of 8 weeks of the relaxation program there was a measured decrease in reported insomnia and improvement on sleep quality.	Improvements on perceived stress seemed to correlate with a decrease in salivary cortisol levels, a biological marker of stress. Depression and anxiety symptoms also decreased significantly at the 8-week point. Patients with primary insomnia using relaxation techniques reported decrease in stress and symptoms of primary insomnia. Utilizing simple techniques such as diaphragmatic breathing, progressive muscle relaxation and guided imagery may be regarded as an effective and low cost non-pharmacological treatment of insomnia
Relaxation and Breathing Techniques	Waters, W. F., Hurry, M. J., Binks, P. G., Carney, C. E., Lajos, L. E., Fuller, K. H., . . . Tucci, J. M. (2003). Behavioral and hypnotic treatments for insomnia subtypes. <i>Behavioral Sleep Medicine, 1</i> (2), 81-101. http://dx.doi.org/10.1207/S15402010BSM0102_2	Progressive muscle relaxation, cognitive distraction, sleep restriction, stimulus control, Dalmane (medication), sleep hygiene. Hypothesis is that people with physical and emotional stresses have greater physiological arousal thus interfering with sleep.	N=52 adults	Progressive muscle relaxation (MR) with cognitive distractions (CD) versus Sleep restriction (SR) plus stimulus control (SC) for sleep onset issues. Sleep restriction (SR) plus SC versus Dalmane for sleep maintenance. All variables were compared to sleep hygiene (SHE) in the 2nd phase.	Overall behavioral treatments of PMR, SR, SC, along with sleep hygiene (SHE) were more effective in improving sleep quality than sleep hygiene alone, but not as effective as the MED (Dalmane). Behavioral treatments could be used comprehensively or sequentially to address insomnia.
Relaxation and Breathing Techniques	Pallesen, S., Nordhus, I. H., Kvale, G., Nielsen, G. H., Havik, O. E., Johnsen, B. H., & Skjotskift, S. (2003). Behavioral treatment of insomnia in older adults: An open clinical trial comparing two interventions. <i>Behaviour Research and Therapy, 41</i> (1), 31-48. http://dx.doi.org/10.1016/S0005-7967(01)00122-X	Sleep hygiene (SH) plus stimulus control (SC) versus SH plus relaxation tape (RT) The control group followed a 4 week wait list before being randomly assigned to either SH/RT or SH/SC.	N=55 adults	Open clinical trial comparing sleep hygiene plus stimulus control vs sleep hygiene plus relaxation tape.	26.8% with sleep onset insomnia improved at 6 month follow up; 25.8% with sleep maintenance insomnia improved at 6 months follow up in the SH/SC group. 43.4% improved either with sleep onset or sleep maintenance, and 33.3% showed improvement from the SH+RT. 33% showed improvement in one of the two categories with below average compliance. Statistical improvement of sleep onset, sleep maintenance from baseline to post treatment. No improvement in early morning wakening.

Yoga	Khalsa, S. B. S. (2004). Treatment of chronic insomnia with yoga: A preliminary study with sleep-wake diaries. <i>Applied Psychophysiology and Biofeedback</i> , 29(4), 269-278. http://dx.doi.org/10.1007/s10484-004-0387-0	Baseline diary entries for 2 weeks and diaries for the intervention period of 8 weeks for sleep measures: total wake time, total sleep time, sleep efficiency, sleep quality 1-5 scale, sleep onset latency, wake time after sleep onset, and restedness at wake time 1-5 scale. Intervention was a daily yoga program for 8 weeks in experimental group, no program in control group.	N=20	A yoga treatment was evaluated for insomnia with use of sleep-wake diaries pre- and post-treatment. Participants practiced yoga on their own daily (30-45") following a single in-person training session. Measure of sleep efficiency (SE), total sleep time (TST), total wake time (TWT), sleep onset latency (SOL) and wake time after sleep onset (WASO) were derived from sleep-wake diary entries.	Statistically significant effects for TWT, TST, SOL, WASO and SE at end treatment as compared to pretreatment.
Yoga	Manjunath, N.K., & Telles, S. (2005). Influence of yoga & Ayurveda on self-rated sleep in a geriatric population. <i>Indian Journal of Medical Research</i> , 121(5), 683-690. Retrieved from www.ncbi.nlm.nih.gov/pubmed/15937373	Baseline ratings, three months and six months completed for three groups; yoga intervention (n=23), Ayurveda (n=23), and wait-list control (n=23). Self-ratings for SOL, TST, rested feeling, and number of awakenings.	N=69 over the age of 60	This study compares the effects of Yoga and Ayurveda on the self-rated sleep in a geriatric population in Indian home for the elderly. The sample was stratified based on age (five year intervals) and randomly allocated to three groups: Yoga (physical postures, relaxation techniques, and voluntarily regulated breathing), Ayurveda (a herbal preparation), and wait-list control (no intervention). The groups were evaluated by self-assessment for sleep at baseline, three, and six months of the respective interventions.	Significant decrease in SOL of 10 minutes in yoga group, no significant change in other groups. Average increase in TST = 60 minutes in yoga group and improved feeling of being rested.
Yoga	Halpern, J., Cohen, M., Kennedy, G., Reece, J., Cahan, C., & Baharav, A. (2014). Yoga for improving sleep quality and quality of life for older adults. <i>Alternative Therapies in Health and Medicine</i> , 20(3), 37-46. Retrieved from http://www.alternative-therapies.com/openaccess/AT_HM_20_3_halpern_37_46.pdf	Subjective variables: self-reported sleep questionnaires (PSQI, ESS), self-reported mood states, health survey (SF-36), and daily sleep and practice logs. Objective variables: mobile home sleep studies using portable sleep monitoring devices. Intervention: Yoga group and wait list group. Yoga group attended classes twice weekly and participated in daily home meditation practice.	N=67, over the age of 60	Study objectives evaluated efficacy of yoga for insomnia in older adults, effects on QOL, and applicability of yoga for older adults in a western setting. Design was a nonrandomized controlled trial with a wait list group and an intervention group. The high compliance yoga group demonstrated significant subjective improvements over the lower compliance group.	Results in yoga group were significant for improved sleep efficiency, overall sleep quality, sleep latency and duration in addition to well-being, depression measures and health status from the various surveys. The objective measure of increased slow wave sleep and subjective measures of sleep were more significant in the high compliance subset of the yoga group as compared to the lower compliance subset. Yoga is a safe intervention for older adults.

Yoga	<p>Hariprasad, V. R., Sivakumar, P. T., Koparde, V., Varambally, S., Thirthalli, J., Varghese, M., . . . Gangadhar, B. N. (2013). Effects of yoga intervention on sleep and quality-of-life in elderly: A randomized controlled trial. <i>Indian Journal of Psychiatry</i>, 55(Suppl 3), S364-S368. http://dx.doi.org/10.4103/0019-5545.116310</p>	<p>Quality of sleep (PSQI) and World Health Organization Quality of Life (QOL) at baseline and after 6 months measured in yoga group and waitlist group (no intervention).</p>	N=87	<p>Random controlled trial to examine the effects of yoga intervention on quality-of-life (QOL) and sleep quality in the elderly living in long-term care facilities. Design was a single blind controlled study with block randomization for the yoga and the control/wait-list groups. The yoga group received instruction on poses and breathing techniques daily for one month, then weekly for two months, then encouraged to engage in self-practice. Outcomes measured for both groups.</p>	<p>Benefits noted in physical and psychological health and quality of life of participants. Yoga group had significant increase noted in total sleep quality, and reduced measurements of stress.</p>
Yoga	<p>Afonso, R. F., Hachul, H., Kozasa, E. H., Oliveira, D. S., Goto, V., Rodrigues, D., & ... Leite, J. R. (2012). Yoga decreases insomnia in postmenopausal women: A randomized clinical trial. <i>Menopause (New York, N.Y.)</i>, 19(2), 186-193. http://dx.doi.org/10.1097/gme.0b013e318228225f</p>	<p>Questionnaires used; Beck Anxiety Inventory, Beck Depression Inventory, Kupperman Menopausal Index, Menopause-Specific QOL, Lipps Inventory of Stress Symptoms for Adults and Insomnia Severity Index (ISI) at baseline and 4 months. Polysomnographic measurements were obtained one night before the study and one night post intervention. Intervention: yoga group (1 hour session 2 times weekly), passive stretching group (1 hour 2 times weekly) and control group (no intervention) for four months.</p>	N=44 women 50-65 years of age	<p>The study evaluated the effect of standardized yoga practice on the physical and mental health and climacteric symptoms of postmenopausal women with insomnia. There have been no studies evaluating the effects of yoga on postmenopausal women with insomnia. This rigorous controlled and randomized design highlights the effectiveness of a specific sequence of yoga for insomnia and menopausal symptoms.</p>	<p>The yoga group showed significant improvements in menopausal symptoms using MENQOL and KMI scores. Sleep scores and QOL scores were significantly improved in the yoga group compared to the control. The yoga group improved on all measures: anxiety, depression, menopause symptoms, stress and insomnia.</p>
Yoga	<p>Cohen, L., Warneke, C., Fouladi, R. T., Rodriguez, M. A. and Chaoul-Reich, A. (2004). Psychological adjustment and sleep quality in a randomized trial of the effects of a Tibetan yoga intervention in patients with lymphoma. <i>Cancer</i>, 100(10), 2253-2260. http://dx.doi.org/10.1002/cncr.20236</p>	<p>Questionnaires at baseline and post-intervention: Impact of Events Scale, Spielberger State Anxiety Inventory, Centers for Epidemiologic Studies-Depression, Brief Fatigue Inventory, Pittsburgh Sleep Quality Index. Lymphoma patients assigned to yoga group (7 weekly sessions) or wait list control group.</p>	N=39 adults with lymphoma	<p>Research suggests that stress-reduction programs tailored to the cancer setting help patients cope with the effects of treatment and improve their quality of life. A random –controlled trial examined the effects of the Tibetan Yoga (TY) practices of Tsa lung and Trul khor, which incorporate controlled breathing and visualization, mindfulness techniques, and low-impact postures in patients with lymphoma. The Yoga group attended one weekly session of instruction for 7 weeks. Written materials and audiotape was distributed and group asked to perform. techniques once a day. No intervention for control group. Participants reported practice frequency 2- 3 times a week.</p>	<p>The Tibetan Yoga group had a decrease in sleep disturbances, improved subjective sleep, sleep latency and duration. The participants also used fewer sleep medications than the control group.</p>

Appendix G

Reminder Email

Dear Healthcare Provider,

You recently received a request for participation in our Master's thesis research project on the development of an educational resource on complementary and integrative practices for the management of chronic insomnia. In order to meet our course requirements, our survey will only be available through February 5, 2017. We would appreciate your time and interest as an experienced healthcare provider working with individuals living with chronic insomnia.

Please follow the link to review the brief research summary and complete the survey. The entire process will require about 10-15 minutes of your time.

We appreciate your time and look forward to hearing from you.

Research Team Members,

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