

THESIS

COLLEGE VETERANS' EXPERIENCES OF INVOLVEMENT IN COGNITIVE
BEHAVIORAL THERAPY FOR INSOMNIA PROGRAM

Submitted by

Jessica Smith

Department of Occupational Therapy

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Master's Committee:

Advisor: Aaron Eakman

Karen Adler

Shannon Hughes

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ABSTRACT

COLLEGE VETERANS' EXPERIENCES OF INVOLVEMENT IN COGNITIVE BEHAVIORAL THERAPY FOR INSOMNIA PROGRAM

Objective. Despite quantitative research which indicates that cognitive behavioral therapy for insomnia (CBT-I) is an effective treatment for chronic insomnia, there is little qualitative research which exists regarding the experiences related to participation and adherence. The purpose of this study was to explore veterans' experiences of adherence to a multicomponent CBT-I program and its impact on occupational engagement. Method. To answer the two research questions: 1) What, from the perspective of veteran participants, influenced adherence to a multicomponent CBT-I program? And 2) How is adherence to multicomponent CBT-I experienced in relation to its impacts on occupational engagement? Qualitative data were gathered through the use of semi-structured interviews which were then transcribed and coded via a process of First and Second Cycle coding by three separate researchers. Self-Determination Theory (SDT) was used as a guiding framework to interpret results related to motivation in the current study due to its proven application in behavior change programs such as CBT-I. Results. Qualitative data analysis revealed the presence of three categories that captured the experience of adherence and occupational engagement as a result of participation in a CBT-I program: Extrinsic Forms of Motivation Influenced Adherence, Social Environment can Support or Hinder Adherence and Bidirectional Relationship between Activities and Routines. Extrinsic Forms of Motivation were influenced by the receipt of a reward, emotional responses (i.e. guilt), past experiences and understanding the mechanisms that impact sleep and gaining "tools" as a result of this

understanding. An additional motivating factor came from the body itself. As the body's sleep-wake system became entrained as a result of continued adherence, participants experienced the body as motivating. The social environment was determined to be composed of factors within the home and outside of the home. Both people and obligations (such as being a part of a sports team) had the potential to support or hinder adherence to CBT-I components. Additionally, there was evidence that coursework and academic commitments associated with being a college student were important facets of the social environment that influenced participants' ability to adhere. Finally, research revealed that activities and routines played an important role in adherence. The restructuring of activities and the purposeful use of activities as a way to occupy waking time were strategies participants used to support adherence. The development of routines also went on to aid in building sleep drive, which in turn positively impacted adherence. Conclusion. The present study provides novel qualitative data regarding adherence and occupational engagement as a result of participation in CBT-I that can be understood in regards to three categories: Extrinsic forms of motivation influenced adherence, social environment can support or hinder adherence and bidirectional relationship between activities and routines. Designing CBT-I programs which are built on factors that are experienced as supportive has the potential to impact overall adherence and therefore effectiveness, of CBT-I programs.

TABLE OF CONTENTS

ABSTRACT.....	ii
INTRODUCTION.....	1
Introduction to Insomnia and Daytime Functioning.....	1
Treatments for Insomnia.....	2
Adherence to CBT-I.....	5
PURPOSE.....	7
METHOD.....	8
Study Design.....	8
Restoring Effective Sleep Tranquility Program.....	9
Data Collection.....	10
Data Analysis.....	11
Rigor.....	13
Guiding Framework.....	13
RESULTS.....	16
Extrinsic Forms of Motivation Influenced Adherence.....	16
Controlled Motivation	16
Autonomous Motivation.....	17
Additional Motivating Factors.....	19
Social Environment can Support of Hinder Adherence	19
Within the Home	20
Outside the Home.....	20

Bidirectional Relationship Between Activities and Routines.....	22
DISCUSSION	26
Extrinsic Forms of Motivation Influenced Adherence	26
Controlled Motivation	26
Autonomous Motivation	28
Additional Motivating Factors.....	30
Social Environment Can Support or Hinder Adherence	32
Within the Home.....	32
Outside the Home.....	33
Bidirectional Relationship Between Activities and Routines.....	35
LIMITATIONS AND FUTURE RESEARCH.....	38
CONCLUSION.....	40
REFERENCES.....	41
APPENDIX A.....	46
APPENDIX B.....	48

INTRODUCTION

Sleep difficulties are a common complaint among Americans, with insomnia accounting for the greatest number of sleep related diagnoses. Chronic insomnia has effects that extend beyond consistent inability to sleep. Both physical and mental health are adversely impacted when ability to sleep is compromised. Current research suggests that cognitive-behavioral therapy for insomnia (CBT-I) is an effective treatment for chronic insomnia, but little is known about the experiences related to program participation and adherence in such programs. This is especially true as it pertains to the military veteran population. The purpose of this study was to examine the perceptions of post 9/11 veterans who completed a 7-week CBT-I program to understand their experiences with adherence to the program and its impact on their occupational engagement.

Introduction to Insomnia and Daytime Functioning

Insomnia is defined as having dissatisfaction with sleep quantity or quality, associated with one or more of the following symptoms: difficulty initiating sleep, difficulty maintaining sleep or early-morning awakenings with inability to return to sleep. The disordered sleep must also result in some type of daytime impairment (social, occupational, academic, etc.). Chronic insomnia is diagnosed when symptoms persist beyond three months and occur at least three nights per week. (American Psychological Association, 2013). Recent statistics suggest that 10-15% of the general population experiences insomnia (Green & Hank, 2015). This rises to 24% when assessing Operation Enduring Freedom/Operation Iraqi Freedom veterans, making it a topic of particular importance to this population (Troxel et. al, 2014). Chronic insomnia's effects on health are far reaching and long term. Studies have shown correlations between chronic

insomnia and decreased health status, including an increased risk for physical illness, cardiovascular diseases, hypertension and obesity (Cappuccio et al., 2011; Chien et al., 2010; Knutson, 2010). Additionally, a study conducted by Kripke et al. (2002) found that participants sleeping less than 6 hours a night were at increased risk for mortality.

From an occupational therapy perspective, we recognize the effects of chronic inability to sleep on health status and the resulting effects on a person's ability to function during the day. The American Occupational Therapy Association (AOTA, 2014) defines rest and sleep occupations as "activities related to obtaining restorative rest and sleep to support healthy, active engagement in other occupations" (p. 20). Individuals suffering from insomnia face a decreased ability to participate in the roles, routines and activities that give their lives meaning (Faulker & Mairs, 2015; Taylor et al., 2014). This includes decreased ability to perform self-care tasks, hold a job, and maintain social relationships. Further, a study by Kyle, Espie and Morgan (2009), found that people with insomnia score lower on quality of life measures. When understood within the context of its effects on daytime functioning, chronic insomnia and sleep disturbances are of concern to occupational therapists and are an area that can be further examined in order to better serve those affected by the "occupational consequences" of sleep difficulties (Faulkner & Mairs, 2015).

Treatments for Insomnia

The current study uses utilizes the 3P Model of Insomnia developed by Spielman and Glovinsky (1987) in understanding the possible causes of insomnia. This biopsychosocial model suggests that insomnia is the result of the presence and interaction of three factors: predisposing, precipitating and perpetuating, which may have biological, psychological or social bases. Predisposing factors are individual variants, which include temperament and gender.

Precipitating factors are stressors including major life events and any psychological environmental or medical factors. Finally, perpetuating factors are maladaptive behaviors and thoughts. Perpetuating factors are described as the modifiable thoughts or behaviors held by individuals (Troxel et al., 2014). Viewed from the perspective of this model, effective treatments may address all of the components (biological, psychological and social) which may be impacting a person's ability to participate in restorative sleep. In the veteran population, there are a variety of factors which are military specific and viewed as potentially attributed to the higher rates of insomnia observed in the veteran population, making this population of particular importance in sleep research and treatment.

Current treatments for insomnia fall under the category of being either medical or behavioral. Medication management for chronic insomnia primarily includes the use of sedative antidepressants, hypnotics or low doses of antipsychotics (Perlman et. al, 2008; Troxel et, al, 2014). Management of insomnia through use of these medications has been shown to have good short-term effects in regards to sleep onset (ability to fall asleep) and sleep duration (length of sleep) but has limited long-term effects (primarily due to habituation) and limited impacts on sleep quality. Sleep quality includes subjective experiences of sleep, depth of sleep, feeling of being rested upon awakening and satisfaction with sleep (Pilcher, Ginter & Sadowsky 1997). Poor sleep quality is especially evident when the treatment of insomnia co-occurs with comorbid conditions including pain and psychiatric disorders (Koffel, Koffel & Gehrman, 2015; Margolies, 2013; Troxel et al., 2014; Perlman et al., 2008).

Of the typical behavioral treatments available to address chronic insomnia, multicomponent cognitive behavioral therapy for insomnia (CBT-I) is the most commonly utilized and is now considered a first line treatment by the National Institutes of Health (Koffel,

2015). The main components of CBT-I are stimulus control therapy (SC), sleep restriction therapy (SR), cognitive therapy, psycho-education, and sleep hygiene (Bootzin & Manber, 2013). Stimulus control is intended to strengthen the bed as a cue for sleep and is made up of 5 components. 1) Only sleep and sex in bed, 2) Getting out of bed if you are there for more than 10-15 minutes, 3) Going back to bed only when sleepy, 4) Not watching the clock, and 5) Getting out of bed within five minutes of the alarm going off. Sleep restriction works on the principal of building sleep drive to increase the body's ability to produce sleep when in bed at night. The total time a person is allowed to spend in bed each night is dependent on the body's unique ability to produce sleep. Persons are given a set wake up time or their prescribed time out of bed (PTOB) and a prescribed time to bed (PTTB) as requirements of sleep restriction therapy. Sleep hygiene is composed of strategies such as limiting alcohol/caffeine consumption, exercising, eating healthily, and keeping a consistent daytime routine (Eakman et al., 2017, Kyle et al., 2015, Stewart et al, 2015). Strategies based in psychoeducation and cognitive therapy are used to identify and address the core beliefs participants have surrounding sleep, to promote sleep that is more restorative and effective through behavioral change (Koffel, 2015).

In addition to the benefits of faster sleep onset and longer sleep duration seen in pharmacological treatment of insomnia, CBT-I is more effective than pharmacological treatments in increasing sleep efficiency, which is a significant determinant of waking up feeling refreshed and being able to effectively function during the day (Perlman et al., 2008). A mixed methods study conducted by Kyle and colleagues which explored the patient experience of participation in sleep restriction therapy found that with respect to daytime functioning, participants noticed “positive changes in energy levels, fatigue and aspects of work life and social functioning” (2010, p. 745). Viewed in this manner, we understand sleep not only as its

own occupation, but also as an occupation that affects every additional waking occupation. For occupational therapists, understanding the effects of restorative sleep on daily occupational engagement is imperative, yet still relatively under researched (Brown & Stoffel, 2011).

Adherence to CBT-I

Despite the positive impacts associated with CBT-I, studies identify low adherence to CBT-I components (especially to prescribed time to bed, prescribed time out of bed, stimulus control and sleep hygiene) as a potential barrier to fostering its full benefits. Adherence to CBT-I components are thought to range between 55% and 89 % (Vincent, Lewycky & Finnegan, 2008). Research suggests that CBT-I programs are most effective for those with high adherence rates; therefore, understanding factors which affect adherence is important to effective therapy (Troxel et al., 2014).

Most of the research surrounding adherence is quantitative. Within these studies, short sleep durations and elevated symptoms of depression prior to participation in CBT-I programs were viewed as contributing to higher attrition rates (Ong, Kup & Manber, 2007; Trockel, Karlin, Taylor & Manber, 2013). Other studies of adherence have produced findings that indicate a need for qualitative research to explore additional factors influencing adherence. For example, in a sample of 34 women with breast cancer and comorbid insomnia, Matthews et al. (2012) determined that adherence to sleep restriction therapy was most affected by self-reported motivation to change, which calls for “qualitative research with a focus on individual meaning of adherence” (p. 226).

Similarly, Vincent et al. (2008) conducted a correlational design study with 40 adults with chronic primary and comorbid insomnia to investigate adherence to a CBT-I program. Results indicated that participants who perceived fewer barriers (such as boredom and

annoyance) to sleep restriction and stimulus control were more adherent. The authors however, described the lack of exploration of adherence behavior as a limitation of the study and an area requiring additional research. In other words, it is unclear what participants in the study were doing in order to adhere and suggests further research be conducted to understand participants' experiences with learning and implementing these strategies for adherence into their daily lives.

Initial understandings of adherence provided by quantitative studies has determined the importance of adherence in CBT-I however, qualitative research is necessary in order to enhance understanding of adherence specifically. A comprehensive review completed by Matthews and McCarthy (2013) revealed only 15 studies which specifically examined adherence to CBT-I. Results from these studies indicated that there was no demographic or medical characteristics which were associated with adherence. However, psychological characteristics including anxiety and depression were somewhat reliable predictors of adherence, as were attitudes including motivation to change. The authors concluded that adherence remains understudied. However, significant clinical gains may be made by examining specific factors related to adherence including gathering qualitative data regarding the experience of adherence from the patient perspective.

PURPOSE

In respect to the existing literature surrounding CBT-I, there still exists little to no research that specifically examines the experience of and behaviors associated with adherence, despite the call for these studies. The purpose of this study is to explore veterans' experiences of adherence to a multicomponent CBT-I program as well as explore its impact on occupational engagement and daytime functioning with regards to activity performance. Exploring adherence to programs aimed at treating chronic insomnia in veterans and developing foundational knowledge regarding the use of activity to improve adherence may improve services in CBT-I and in occupational therapy for veterans. With this knowledge, practitioners will be more prepared to support adherence and, therefore, improve effectiveness of multicomponent CBT-I for veterans.

METHOD

Study Design

The current study adopted a pragmatic approach to natural inquiry based on the goal of understanding the experiences of participants in a multicomponent CBT-I program called Restoring Effective Sleep Tranquility (REST). The use of a pragmatic approach also lends itself to “guiding action in real-world settings,” which is critical if this research is to be used to guide CBT-I program development. (Glasgow, 2013, p.260). Qualitative data were gathered through the use of semi-structured interviews which were delivered via focus groups and individual interviews from consenting participants upon their completion of a multicomponent CBT-I program. Two research questions guided this study: 1) What, from the perspective of veteran participants, influenced adherence to a multicomponent CBT-I program? 2) How is adherence to multicomponent CBT-I experienced in relation to its impacts on occupational engagement?

The research team for the current study consisted of one occupational therapy graduate student and two occupational therapy professors. One of the professors was the developer of the Restoring Effective Sleep Tranquility (REST) program from which data were gathered for the current study. Additionally, the graduate student has aspirations of working with the veteran population upon graduation. Disclosure of the involvement of these researchers is provided in accordance with suggestions by Caelli, Ray and Mill (2003) to provide an additional source of rigor for pragmatic research based on disclosure of associations and expectations. This study was approved by the university’s review board in August of 2015 (#15-5974H).

Restoring Effective Sleep Tranquility Program

The Restoring Effective Sleep Tranquility (REST) program was conducted with post 9/11 veterans with service-connected injuries, who were university students, had self-reported sleep disturbances and were committed to completing a multicomponent CBT-I program, except for one participant who separated from military service before 2001. Participants in REST completed multi-component CBT-I by attending seven group delivered sessions and seven to eight one on one sessions. Group sessions were used to deliver sleep education and facilitate group discussion on topics including: sleep restriction, stimulus control, the circadian rhythm, sleep drive, sleep beliefs, and the use of activity to improve sleep. They were also used to practice mindfulness techniques. One-on-one sessions were used to develop, monitor, and reach personalized sleep-related goals based upon sleep restriction and stimulus control therapies and sleep hygiene recommendations. In both the group and one-on-one sessions, the occupational therapist drew the connection between activity and meaningful sleep, thereby encouraging participants to purposely use activity throughout participation in REST (Eakman et al., 2017). Data for the current study were gathered from 19 of the possible 21 participants who completed REST: 5 participants who completed a pilot version of the program and 14 participants (Group A = 6, Group B = 8) who completed a wait list control trial of the program. These 19 participants gave informed consent to be in REST and be interviewed as part of this study. Demographic data regarding participants is offered in Table 1.

Table 1: Demographic Information on Participants

<i>Participant ID</i>	<i>Gender</i>	<i>Age</i>	<i>Branch</i>	<i>Time Since Separation from Military (Months)</i>	<i>Number of Months experienced Sleep Disturbances</i>	<i>Received Prior Treatment for Sleep (Yes/No)</i>
P1	Female	24	Navy	28	36	Yes
P2	Male	26	Marines	52	108	No
P3	Male	27	Marines	11	36	No
P4	Male	24	Air Force	29	38	No
P5	Male	40	Army	25	180	No
P6	Male	29	Marines	73	120	No
P7	Male	27	Army	37	102	Yes
P8	Male	29	Army	74	17	No
P9	Male	27	Army	38	24	No
P10	Male	26	Army	22	60	No
P11	Female	33	Air Force	18	52	No
P12	Male	38	Army	31	228	Yes
P13	Male	58	Navy	424	429	Yes
P14	Male	33	Army	9	113	No
P15	Male	52	Marines	18	75	Yes
P16	Male	33	Army	79	120	No
P17	Male	37	Air Force	73	3	Yes
P18	Male	32	Coast Guard	25	22	No
P19	Male	31	Navy	41	60	Yes

Data Collection

Qualitative data for this study were gathered through interviews lasting approximately 30-60 minutes after the completion of one of the three REST session (Pilot, Group A or Group B). Preferred format for the delivery of the interviews was in person in the context of focus groups. However, a one on one in-person interview or phone interview was available to those who needed the accommodations (see Table 2 for summary of formats for interviews). The interviews were guided by semi-structured questions developed to promote discussion of the individual experiences of both adherence and occupational engagement as posed in the two research questions. Examples of questions developed to gather data surrounding adherence

included: In relation to stimulus control strategies, which of these techniques were easier to use?; What were the factors that made using these easier? To address occupational engagement, questions were asked which addressed the activities participants engaged in, and aimed to discover whether activities and routines changed. Examples include: What changes, if any, have you noticed in how you function during the day?; How did having a set time to rise in the morning influence your morning activities?; How did have a prescribed bedtime influence your evening activities? Initially, research questions were created and used with the pilot group. Based on data collection from this group, the questions were refined before being used with Group A. This was done to promote data collection that was relevant to the research questions posed. These questions were again refined for Group B based on data collection from Group A. (See Appendix A for complete list of semi-structured interview questions used).

Table 2: Interview Formats by Group

	<i>Pilot</i>	<i>Group A</i>	<i>Group B</i>
Focus Group (n=4)	5	3	5*
Individual (n=6)	0	4	2

** 2 focus groups were held for Group B, 2 participants were in one and 3 were in the other*

Data Analysis

A total of 10 interviews were conducted, which were audio recorded and transcribed verbatim. Transcribed interviews were distributed to three researchers. The primary researcher read all 10 interviews while the remaining two researchers each read 5 interviews. After first read through of the interviews, the researchers came together to discuss initial impressions. Based on these impressions and key words derived from the interview questions, the researchers developed an initial code list. This code list was created to organize the data from the transcripts

into similar “chunks”, a process Miles, Huberman and Saldana define as First Cycle coding (2014). Once the initial code list was created the researchers re-read through the interviews they were assigned, coded these interviews based on the list and then met in person to reach consensus on the application of these codes. (DePoy & Gitlin, 2014). This method of creating and applying codes was a deductive approach as the codes that were developed were based on the research questions posed by the study. Examples of codes which were First Cycle and deductive included ‘activity’ and “adherence.”

An additional process of inductive coding occurred simultaneously during the coding process. Miles, Huberman and Saldana define inductive coding as allowing for the emergence of additional codes not in the initial code list (2014). This assures that all participants’ experiences were captured. Inductive codes were based on the researchers’ identification and consensus of additional chunks of data that emerged using words that reflected participants’ language. An example includes the code “tools,” which was defined by the researchers as “strategies or knowledge with utility or purpose.” This code portrayed the language used by multiple participants and captured an experience that could not otherwise be coded within the context of the initial codes. The final code list consisting of both the initial and open codes is included as Appendix B.

After First Cycle codes (encompassing both deductive and inductive codes) were applied to each interview, a process of Second Cycle coding was used. Miles, Huberman and Saldana (2014) identify that Second Cycle coding is used for grouping summaries of data from First Cycle coding into condensed categories for interpretation. Second Cycle coding is used to summarize data based on 1) categories, 2) causes, 3) relationships among people and 4) theoretical constructs (Miles, Huberman & Saldana, 2014). The three researchers met once a

week for four weeks to determine Second Cycle codes. During this process, First Cycle codes were grouped into categories based on commonalities and presented as either pertaining to adherence or occupational engagement (as these were the two topics of the research questions posed). Once consensus was met regarding categories, each of the 10 interviews were revisited and the data were coded using these Second Cycle Codes. These final codes were then used to report the findings from this study. Miles, Huberman and Saldana (2014) support the use of this process of group coding as it allows for the clarification of the definitions of codes, as well as provides a reliability check.

Rigor

Rigor was addressed through triangulation by researcher, meaning findings were confirmed by using three different researchers to analyze the data. (Miles, Huberman & Saldana, 2014). Through the process in which the three researchers came together and discussed each interview and developed/applied First and Second Cycle codes, it was ensured that the data was correctly captured, interpreted and represented (Miles, Huberman & Saldana, 2014). Additional strategies for rigor included keeping an electronic trail of the evolution of the codes and their definitions, maintaining an audit trail/memoing after completion of interviews to encapsulate initial reactions and being reflexive in clearly identifying the position of the primary researcher (Caelli, Ray and Mill. 2003).

Guiding Framework

Self Determination Theory (SDT) as developed by Ryan and Deci (2002) was utilized as a framework to interpret the data. This framework was chosen based on the results of a meta-analysis by Ng et al. (2012) that revealed that 184 studies had used the SDT as a guiding framework to encourage motivation in health behavior change programs including smoking

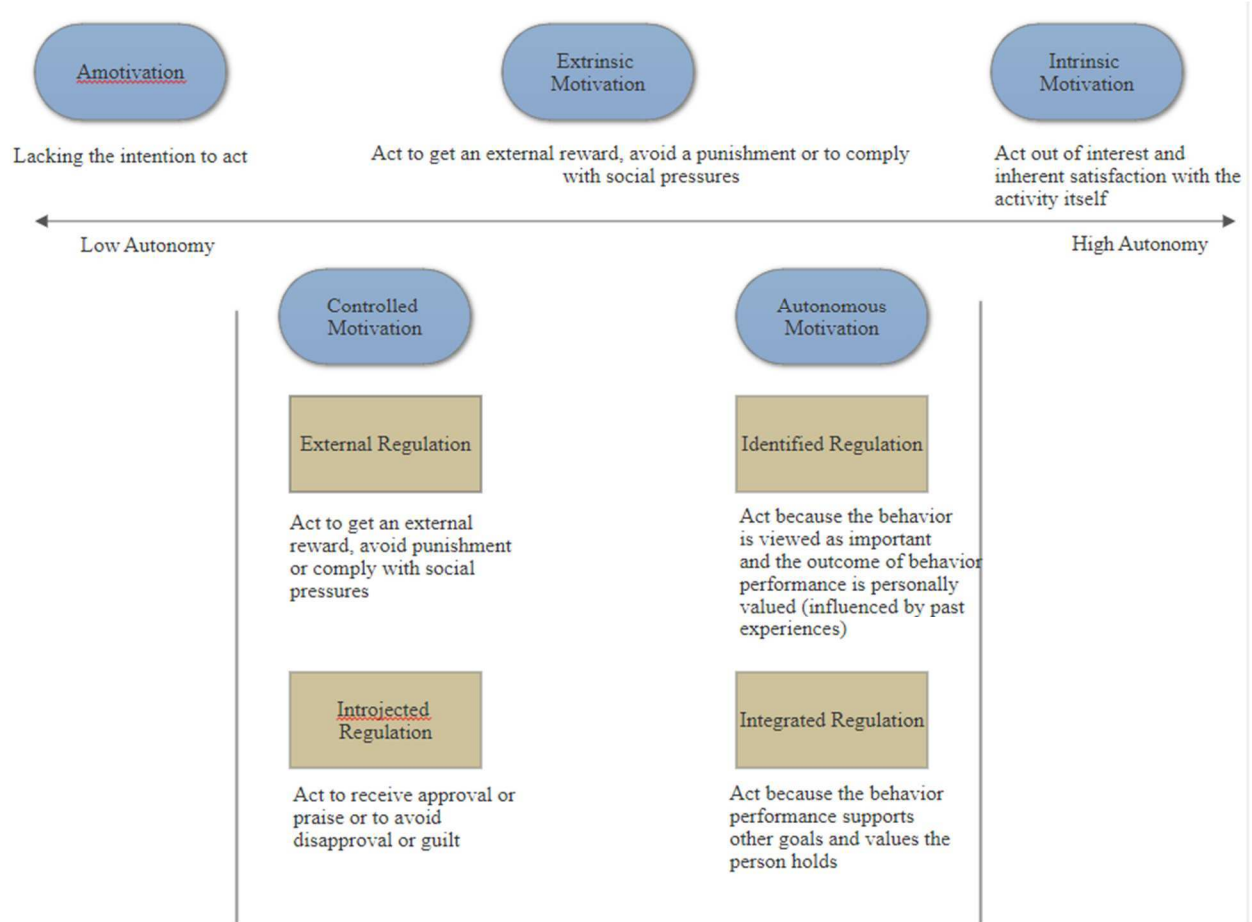
cessation, weight loss and medication adherence. SDT was determined to be a viable framework to use when examining motivation for health-related behaviors based on the results from this meta-analysis.

SDT views motivation as occurring along a continuum containing three primary types of motivation. Extrinsic motivation, a primary type of motivation, is further classified into two forms: controlled and autonomous motivation. Figure 1 has been adapted from Ryan, Patrick, Deci and Williams (2008) and provides definitions for each type of motivation and is a visual that can be used to guide understanding of the results from the present study in regards to the SDT.

According to SDT, the factor that determines which type of motivation is being exhibited is autonomy. Autonomy is defined as “the perception of being the origin of one’s own behaviors and experiencing volition in action,” (Ng et. al, 2012). Behaviors that are classified under Amotivation are considered to have no autonomy associated with their performance, while behaviors that are classified under intrinsic motivation are considered completely autonomous. Although autonomy is equated to intrinsic motivation, lesser degrees of autonomy are present in Autonomous Motivation, one of the two forms of extrinsic motivation.

Based on the SDT, being autonomously motivated is important as it equips a person to be more persistent and more effective in their behavior performance. Additionally, having some degree of autonomy results in an individual having more choice, volition, and freedom in their behavior performance: supporting continued behavior performance after program completion (Ryan, Patrick, Deci and Williams, 2008). Therefore, results related to motivation from the present study are discussed in regards to the degree of autonomy exhibited.

Figure 1: Adapted Self-Determination Theory Framework



RESULTS

The results address the two research questions related to adherence and occupational engagement. Data analysis revealed that the questions could be addressed through the acknowledgement of three categories: Extrinsic Forms of Motivation Influenced Adherence, Social Environment Can Support or Hinder Adherence and Bidirectional Relationship between Activities and Routines. Each participant was assigned a unique ID (P1-P19) in order to utilize quotes for the support of each category without breaching confidentiality. Additionally, if quotes were provided by a participant in the context of a focus group, this is noted next to their participant ID.

Extrinsic Forms of Motivation Influenced Adherence

The first category resulting from data analysis was the recognition that various forms of extrinsic motivation as posed by the SDT were the driving force behind the behavioral change required of participation in a multicomponent CBT-I intervention. The following results are presented in regards to which form of extrinsic motivation (controlled or autonomous) is noted as influencing motivation for adherence with emphasis on SR and SC. These factors will be explained in terms of the SDT in the discussion section.

Controlled Motivation

The receipt of a FitBit as reward for participation and completion of REST acted as the motivator for adherence to CBT-I for some participants. This was evidence of external regulation according to SDT. When asked by the interviewer what struck him about the advertisement for REST, participant 18 of focus group 1 replied, “Getting one of those,” while pointing to a FitBit.

This idea was echoed by participant 4 who stated: “So knowing that I got the Fit Bit for free was like, “Okay, I need to give it (a try).”

Emotional responses (i.e. anxiety and guilt) were also present as motivating adherence to program components. Emotional responses represented the presence of introjected regulation in the present study. The most salient examples were primarily tied to the one-on-one sessions required of participation in REST. Having someone whom they were obligated to report instances of non-adherence worked to incite, in some participants, a sense of guilt. Therefore, in order to avoid feeling guilty, participants adhered to CBT-I components. In relation to adhering to his prescribed time out of bed and knowing he would have to tell the OT when he didn’t, participant 3 offered during focus group 2:

Yeah, I’d just force myself to get up. There’d be a couple of times where I’d stay in bed for a few minutes and I’d start to feel guilty so I would get up and just kind of start checking my email.

Participant 18 of focus group 1 offered a more general example of adhering secondary to guilt when he said: “I just didn’t like having to tell (the occupational therapist) I didn’t do it, so guilt.”

Autonomous Motivation

Past experiences proved to be an important source of motivation for adherence to the current program and evidence of identified regulation. In particular, participants expressed the similarity between being given orders while in the military and being given “orders” for sleep prescriptions from the occupational therapist during REST:

And so I told (the occupational therapist) I came from the military and I work best from orders. So if you’re ordering me that I have to get out of at this time then that triggers something in my brain a little differently than, “Hey, you need to get up at this time.” “No, I’m ordering you!” And that’s what worked for me. I was like, well, (the

occupational therapist) is ordering me to get out of bed at 6:45. That was the only thing that worked. (P2, Focus Group 2)

Other military experiences proved to be motivating as well. Two participants' quotes clearly illustrate past experiences of sleep deprivation while in the military as providing motivation to adhere to sleep restrictions during REST even when they felt they couldn't.

I mean after the military experience... I feel like if I hadn't gone through that, this would've been so much harder because every time...like especially the first couple of weeks, I would be getting like to the point, "Oh man, I'm going to pass out if I sit in this chair," and I'd look at the time and see I can't go to bed for another two, two-and-a-half hours," and like I said, if I haven't gone through the military...If I hadn't already done tons of sleep restriction already. I would have probably cheated..... (P8, Focus Group 3)

When you're really tired and you're falling asleep sitting down at your desk or falling asleep doing things you don't normally fall asleep doing, it's really difficult to be like, "Alright, but I have to stay up for another 45 minutes because they, you know, its part of the program." It, I mean, it, honestly what came into play with that is a lot of the military training I had, is a lot of the literally not allowing me time to sleep and just kind of the understanding that even though I am incredibly exhausted, I still can keep doing things and I'm going to be okay. (P10)

For some participants, valuing the end goal of restorative sleep and recognizing the connection between sleep and other valued occupations motivated adherence to CBT-I. According to SDT, this was evidence of integrated regulation. Motivation of this type was supported by the acquisition and use of "tools". Tools are best defined as strategies or knowledge about the mechanisms that promote quality sleep which were used purposefully by participants. Examples of tools that participants spoke of included placing their alarm clock across the room to support getting out of bed in accordance with their prescribed time out of bed and knowing that if they chose to nap during the day then they needed to adjust the time they went to bed that night. Having tools that they could use in order to support adherence to CBT-I components gave

participants a sense of control over their sleep quality and was experienced as the most autonomous form of motivation within the context of the current This idea is supported by participant 4 who stated:

I think what their objective was is to give you a set of tools that works best for you and to be able to use those whenever you need. Or if you fall back into it, then are able to act alone and you don't have to seek out help or other things. You have all the materials or you remember like, "I need to cut it back," or "I took a nap so I need to stay up later," those kind of things.

Additional Motivation Factors

Finally, motivation was influenced by a process of somatization that occurred as the body reacted to participation in CBT-I. More specifically, the circadian rhythm and the body's sleep drive systems became entrained. As participants consistently adhered to CBT-I components (primarily SR), they began to feel sleepy around their PTTB at night and alert and ready to wake in the morning near their PTOB. The resulting somatization effect made it easier for them to adhere. Evidence of this finding in relation to adhering to prescribed time out of bed was articulated by participant 11 who said: "Like I might wake up at 5:15 now every day because my body knows that in five minutes you know the alarm is going to go off." This finding was also found in regards to PTTB as supported by participant 10 who stated:

You know, like the fourth night when it was really difficult to stay up to that time, I got really good sleep and it was easier to stay up until that time the next few days because my body was kind of adjusting to staying up, being active until that time and then going to bed.

Social Environment Can Support or Hinder Adherence

The second category which arose throughout data analysis was the recognition of the social environment's impact on participant experiences of adherence to sleep restriction and stimulus control. The social environment included anyone within the multiple environments participants found themselves (including the home, school and work environments) as well as the

activities they were involved in and the social commitments they made while participating in the current study. For clarity, the findings in this category are further organized according to whether they were present within the home or outside of the home of participants.

Within the Home

For some participants, the social environment within the home acted as a support to adherence. Participant 11 explained the support offered by her husband in regards to her prescribed time to bed and how his support aided in her adherence to her sleep prescription:

He was so wonderful because he adjusted his sleep schedule to mine. Not the wake-up time but, he wanted to make sure I knew that he was there for me so he would go to bed when I went to bed and if he came to bed later it might be a couple minutes later or half hour at most, but that only happened a handful of times. So he didn't want me to feel like it was something I had to do by myself and he was going to live his own life. (Focus group 4)

Alternatively, participant 4 shared how the presence of his significant other was sometimes a barrier to adherence to PTTB. “The rise time wasn’t too hard but, there was a few times where she was ready to go to bed and I was like, “No, I can’t go to bed yet.” The idea of the social environment as a barrier to PTTOB was also experienced. Participant 12 shared how the presence of others in his social environment acted as a barrier to adhering to his prescribed time out of bed because it was not in line with the wake up times of the others in his home. “So that was kind of the hardest thing for me was...what am I going to do. I can't walk around the house and wake my daughter and my wife up.” (Focus group 4).

Outside the Home

One factor outside of the home, but still part of the social environment, was the presence of the occupational therapist. Some participants expressed the idea that having the occupational therapist in their social environment as someone whom they were obligated to report instances of

adherence and nonadherence to was a support. The occupational therapist was viewed as the expert and participants relied on his/her knowledge of CBT-I components to support adherence.

The following quotes from participant 10 provide support for the positive impact of the therapeutic relationship on adherence to both sleep restriction and stimulus control.

I was, you know, it was, for me at least, it was a lot of trusting in the OTs and you know, the people at the head of the program telling me that this program works and that adhering to it was the most important part...and trying my best to adhere to that knowing that it was going to be helpful in the long run.

And so, um, the stimulus control was difficult for me to adhere to but I...you know, after they keep continuously telling you to like, “yes it sucks. Its hard, but doing these things will help make your sleep better and help improve your sleep,” you know, I trusted their experience and I did it.

For others, the support offered by the social environment was more a product of the activities that they were engaged in and the social commitments that resulted from their involvement in activities outside of the home. Having a commitment to a team, a group, work or school was seen as a support to CBT-I adherence. This idea was clearly articulated by participant 3 during focus group 2 who expressed the support that being part of a sports team had on his ability to adhere to his prescribed time to bed. “Luckily for me, I guess I had (rugby). Practice ran until 11 most nights, so I was running right up to my time (to bed),” And by participant 6 who offered, “I work part-time Monday, Wednesday, Fridays, so those days I had to be up anyways and leave for work.”

Despite the potential for the social environment to be a support in adherence, there were certain circumstances in which its presence worked as more of a barrier. For example, participant 4 explained how the desire to interact with his friends and family made adherence to his prescribed time to bed and his prescribed time out of bed difficult at times, especially during the weekends:

...when you talk about adherence, the hardest part for me is the weekends, like disappointing whoever on the weekends because there's no way I could adhere to that on the weekends, even if I'm just with family or just doing something with traveling or in a group setting. More times than not, I'm not going to be able to go to bed at whatever or wake up at the same time.

The fact that all participants were college students was also an example of the social commitments that could be experienced as a barrier to adherence (primarily sleep restriction). School commitments challenged time management in participants, often resulting in increased difficulty with adherence to SR. Participants were required to find a way to manage the many demands of their academic program (including homework, group projects and papers) and their sleep prescriptions. This idea was expressed clearly by participant 8 who explained how the coursework associated with his major prevented him from being able to adhere to his prescribed time to bed multiple times throughout his participation in the CBT-I program:

Well unfortunately, because I'm just wrapping up my engineering degree here the sleep restriction stuff got a bit excessive in the sense that like I couldn't meet my prescribed times to bed which in the context of this particular study wasn't so much a problem as waking up at six but...there is several instances throughout the study where I didn't log any sleep on particular nights or stretches of nights and stuff like that.(Focus group 3)

Bidirectional Relationship Between Activities and Routines

The final category, bidirectional relationship between activities and routines, provides data which addresses both adherence and the experience of occupation as a result of participation in a CBT-I program. It is important to recognize that activities and routines occur within the context of social environments and include some of those social commitments discussed previously. In relation to adherence, findings indicated that the majority of participants restructured their preexisting activities (the timing, amount, and order of) to aid in adherence to program requirements. By restructuring their activities, participants were promoting adherence to

both their PTOB and PTTB while purposefully using their time spent awake. Participant 2 offered how the development of a morning routine aided in his prescribed time out of bed:

And now it's nice. It's cool, I'm up at 6:45. I can take my time, make breakfast, take my time getting ready, start on my chores, then I start finishing up chores at 8/9 o'clock and now I have all this time to...do whatever. (Focus group 2)

Additionally, participant 10 offered how he developed a nighttime routine that allowed him to adhere to his prescribed time to bed:

I actually changed up my like going to bed routine. You know, I used to like brush my teeth after I got done with my last meal. Whereas, (now) I would brush my teeth and shower like an hour before I went to bed. So, he (the occupational therapist) told us an hour before bedtime, relax, do something enjoyable. And so an hour before bed I would brush my teeth and then shower and play video games. And so, like, you know, once I did that for a few days, it kind of, I felt I caught on quick to the routine of that. It helped transition to getting ready for bed time...

For some participants, adhering to sleep restrictions affected their occupational engagement. Most participants expressed they were now purposefully using activity to occupy the time they spent awake. One participant explained how he purposefully scheduled his schoolwork to keep him active and engaged until his prescribed time to bed:

...sometimes I would shift my own homework to a little later in the day so that I you know... have something to do. And I'd be sitting at home for an hour and you know, and at like noon or something, I'd be like, "Oh, I have that thing to do," and then I'd be like, "No. I'm going to wait until later you know, when I'm searching desperately for something to keep me occupied, yeah. (P8, Focus group 3)

Most of the participants engaged in activities that were already in place before REST to support adherence to sleep restriction and stimulus control. As suggested by the previous quotes, data supported that participants were engaged in activities such as completing coursework, watching television, spending time with their loved ones, playing video games and participating

in physical activity to help in building sleep drive. However, some participants were now developing new spaces in which they completed their activities and were engaging in these activities at new times. In this way, activities were being used with a purpose, which was to stay active and engaged throughout the day.

For some participants, new activities were adopted during participation in the REST program due to the increased amount of time available to them during the days. This idea is presented by participant 11 who explains how she used a new activity to occupy her mornings and ease into the day ahead with awareness of her social environment.

Yeah, the 5:20 wake up is actually pretty great, it gives me about an hour, sometimes an hour and a half before he gets up. So at first, you know, when I first started it was still kind of hard to get up that early but I had made a meditation room out of this open area we had just because we didn't have anything to put there and I had started doing yoga with the girls and so I would get up in the morning and if.. I have chronic pain, so if I was having a painful day I would maybe be laying down on my heat pad down in the meditation room but I was still awake and I would do either meditative breathing or things like that to help the pain but keep me awake and not let me just fall asleep. (Focus group 4)

The use of consistent daytime routines aided in building sleep drive, which made adherence to prescribed time to bed easier because participants were sleepy and ready for bed when it came time to lay down. Participant 10 explained the relationship he noticed between establishing a routine, staying active throughout the day and being ready for bed in accordance with his PTTB because at the end of the day he was tired.

And I started, I actually changed up my like going to bed routine. You know, I used to like brush my teeth after I got done with my last meal. Whereas, I would brush my teeth and shower like an hour before I went to bed. So, he told us an hour before bedtime, relax, do something enjoyable and so an hour before bed I would brush my teeth and the shower and play video games. And so, like, you know, once I did that for a few days, it kind of, I felt I caught on quick to the routine of that. It helped transition to getting ready for bed time, right?

Finally, participation in a CBT-I program impacted the quality of the activities and routines participants engaged in. This was experienced by participants as an added benefit of

adhering to CBT-I components. Instances of these were coded as “daytime effects,” a First Cycle code used to encapsulate any impact of sleep on daytime functioning, positive or negative. Specifically, school, child care and social participation presented as reoccurring activities participants offered as activities which were impacted by their participation in REST. “...I think I probably have a little more energy and stuff during the day and I had been more efficient at school so I felt like I could give more time to the kids,” (P5); “I’m more alert, more ...I’ve become more active I guess socially,” (P11, Focus group 4); “...The sleep, the added sleep or improvement of sleep aided in the end in like classes and everything,” (P2, Focus group 2).

DISCUSSION

The two research questions this study aimed to answer were: 1) What, from the perspective of veteran participants, influenced adherence to a multicomponent CBT-I program? 2) How is adherence to multicomponent CBT-I experienced in relation to its impacts on occupational engagement? Results supported the emergence of three categories, Extrinsic Forms of Motivation Influenced Adherence, Social Environment Can Support or Hinder Adherence and Bidirectional Relationship Between Activities and Routines in answering these questions. The following discussion is organized according to these three categories.

Extrinsic Forms of Motivation Influenced Adherence

Motivation is defined as the driving force behind action. The present study identified motivation as crucial in influencing adherence to a CBT-I program due to its direct impact on behavior performance necessary for change (i.e. adherence to SR and SC). Throughout the individual and focus group interviews, participants in the present study provided examples of factors that influenced their motivation to engage in behavior performance required of their participation in a CBT-I program. When viewed in the context of the SDT, all of these factors were forms of extrinsic motivation and therefore could be further classified as being either controlled or autonomous forms of motivation (refer to figure 1).

Controlled Motivation

External regulation, the first form of controlled motivation, was evident in the current study when participants shared that the external reward of receiving a FitBit for their participation in REST motivated them to enroll. By offering the FitBit in return for enrollment, REST developers were able to motivate some participants to respond to initial recruitment

efforts. Hidi (2016) performed a review of available neuroscience and psychology literature on motivation and concluded that the use of rewards can “enhance attention, energize behavior and improve memory” under certain circumstances (p.87) and does not necessarily undermine intrinsic motivation as previously thought. Findings from Hidi (2016) are based on the fact that the reward receipt is part of human nature and is not inherently bad, however the circumstances under which rewards are given may disrupt the development of intrinsic motivation. These conditions include the frequency at which rewards are given and whether or not rewards are actively earned or given independent of behavior performance. The impact of these conditions on motivation is not yet fully understood and is a subject warranting more attention.

Combined with findings from the present study, it is evident that external rewards may play a role in behavior change programs. For example, the potential to receive a reward may be influential enough to motivate adherence to program requirements in order to receive a reward. However, based on the SDT, it is important to know that if an individual does not move beyond this form of motivation, the likelihood of long-term adherence is decreased (Ryan, Patrick, Deci & Williams, 2008). This is due to lack of autonomy exhibited in this form of motivation (see Figure 1). Therefore, for an individual whose motivation for CBT-I adherence remains controlled, it is unlikely that they would adhere after the receipt of the reward/end of the program and they would not benefit as fully as someone who is influenced by other forms of extrinsic motivation.

Evidence for introjected motivation, the second form of controlled motivation, in the present study were primarily tied to the one-on-one sessions required of participation in REST. Having the OT as someone whom they were obligated to report instances of non-adherence to worked to guilt some participants. Therefore, in order to avoid feeling guilty, participants

adhered to REST requirements such as going to bed and waking up at their prescribed times. Despite the lack of autonomy exhibited in this form of motivation, it is a type often used by health-behavior change providers to initiate behavior change (Ryan, Patrick, Deci and Williams, 2008). This is due partly to the finding that individuals experiencing introjected motivation are more motivated to exert effort in order to avoid feeling the negative emotional responses that may result if they don't behave in a certain way (Ryan & Deci, 2000). In relation to CBT-I specifically, this effort exertion resulting from introjected motivation could manifest itself in initial SR and SC adherence behaviors.

Implications for these combined findings suggest that the inclusion of one-on-one sessions in a CBT-I program can be beneficial in supporting initial adherence and encouraging initial behaviors. However, it is important to recognize that in regards to the lack of autonomy associated with introjected regulation, this form of motivation is not enough to encourage sustained adherence, which is necessary once the CBT-I program ends.

Autonomous Motivation

Identified motivation is the first form of autonomous motivation. In the context of the current study, this form of motivation was heavily influenced by past experiences. Experiences of military service were seen as contributing the development of certain values held by participants, which went on to impact motivation for adherence in the present study. Research by Rumann, Rivera and Hernandez (2011) indicated that past military experience is an important factor in supporting student veterans in the college environment. For example, the adjustment to a variable schedule of a college student is often experienced as an obstacle to academic performance due to the fact that most veterans are used to the structured routine provided by the military. The value veterans placed on routine was a result of their experiences and went on to

impact life outside the military. Although these findings were in regards to academic performance, the finding that past military experience influences civilian life is an important finding for the current study. It provides evidence for the idea that military experience influences value development. When viewed in accordance with the SDT, the integration of behavior performance that is in line with personal values is experienced as more autonomous. For the veteran population specifically, the current study suggests that there are aspects of past military involvement that can be integrated into and used in CBT-I programs to support adherence and feelings of autonomy. The gap in knowledge remains just how to discover and use the past experiences of participants in CBT-I programs to support adherence via identified regulation.

Integrated regulation, the most autonomous form of extrinsic motivation was also evident in the present study. Participants who experienced this form of motivation were beginning to understand how restorative sleep lent itself to other occupations they valued. In this way, sleep and adhering to CBT-I components which supports restorative sleep, became personally important to participants. The valuing of sleep resulted from participants beginning to understand the mechanisms impacting restorative sleep and adjusting their behaviors to act in accordance with their new knowledge through the use of tools. The use of tools provided participants a way to enact behavior change. Behavior change is the most critical component of effective CBT-I. In the Behavioral Model of Insomnia, as developed by Spielman and Glovinsky in 1987, the adoption of a behavioral treatment requires a person to first understand how chronic insomnia develops. The person must then identify the maladaptive cognitions and resulting behaviors that perpetuate their insomnia. Finally, the person must act to address these maladaptive cognitions and behaviors using motivation as the driving force behind the action to change beliefs and behaviors. The use of tools was the result of this process. As cognition changed, participants

utilized tools to act in accordance with new beliefs. The ability to utilize tools independently was then experienced as motivating. The idea that participants experienced a change in dysfunctional sleep beliefs is supported by Eakman et al. who found this factor as the greatest sleep related outcome in REST (2017).

In regards to SDT, participants who spoke of having gained tools also spoke of the ability to utilize these tools independently. This independence is equated to autonomy, which is necessary for lasting behavior change. This finding indicates that the inclusion of “tools” during the psychoeducation component of a CBT-I program may be a crucial element in creating CBT-I programs that support adherence and have longer lasting effects.

Additional Motivating Factors

Though not directly related to motivation as understood in the SDT, participants experienced an additional form of motivation which resulted from the body’s response to the entraining of the circadian rhythm and sleep drive. Participants expressed that as their circadian rhythm became more naturally entrained as a result of adherence to sleep restriction, it became easier to adhere to their sleep prescription. Many expressed that it became easier to wake up in the mornings, oftentimes waking up naturally within 5 minutes of their alarm. As well as it became easier to fall asleep at their prescribed time to bed as they experienced tiredness that aligned with their bedtime. The idea is that the entraining of the circadian rhythm and sleep drive was experienced as motivating because when the two were in sync and functioning naturally, adherence was experienced as less effortful.

The entraining of the circadian rhythm and sleep drive is a critical component of CBT-I and is based off understanding of the Two Process Model of Insomnia as posed by Borbely (1982). This theory states that sleep regulation is determined by two processes: the homeostatic

(S) and the circadian rhythm (C) which act in opposition to each other and which can become disrupted due to behaviors performed by an individual. Psychoeducation provided in REST gave participants the information regarding what behaviors disrupted the normal processes of the S/C system. The sleep prescription assigned to each individual gave them new behaviors to facilitate a return to normal S/C functioning. Once the body responded to changes in behavior (i.e. sleep restriction) resulting from adherence to CBT-I components, the body began functioning in accordance with the natural S/C cycle.

The idea that entraining the S/C system can be experienced as motivating is supported by existing research. As early as the late 1980s, researchers studied the link between the circadian rhythm, the human reward system and mood. From various studies there exists evidence that the circadian rhythm affects the body's natural reward center, causing the person to interact with the environment primarily by affecting alertness. (Murray et al., 2009, Watson et al., 1999). In the context of the current study, for participants who experienced alertness that aligned with their sleep prescriptions, they were motivated by the body to continue to adhere because the experience was no longer as effortful as it had previously been.

The finding that the body's response to continued adherence was experienced as a support has important implications for practice. One being that it is a piece of information CBT-I facilitators can provide to participants to encourage continued participation, especially during the initial sleep restriction period when adherence is experienced as most difficult. Knowing that the body will respond to adherence and that adherence will eventually become easier may help reduce attrition rates in CBT-I programs.

Social Environment Can Support or Hinder Adherence

The subcategory of Sleep Participation is included as part of the occupation of Rest and Sleep in the Occupational Therapy Practice Framework (AOTA, 2014). This framework acknowledges that in order for a person to participate in the occupation of sleep, it is necessary for them to “negotiate the needs and requirements of interacting with others within the social environment such as children or partners...” (p. S20). Participants in the current study provided salient examples of how their social environments (both within and outside of the home) worked to support or hinder their adherence during participation in REST. SDT (Deci & Ryan, 2002) helps to clarify this finding as it relates to motivation through the acknowledgement that social-contextual factors either support or hinder motivation in individuals due to the fact that the social environment influences the development of values. The values an individual holds impacts motivation to act in accordance with these values. The development and adoption of values lays the foundation for motivation for behavior performance. Therefore, the motivation to adhere to CBT-I components while engaged in REST is undoubtedly subject to the social environment which participants found themselves in. The emergence of the social environment as a support or barrier to adherence as a category is not unexpected, however the present study provides a perspective on the social environment as it relates to CBT-I that has not been previously examined.

Within the Home

Data from the current study provides evidence for the fact that participants’ adherence was impacted by their significant others’ (and other family members’) within the home schedules. Most notably, participants expressed the tension that resulted from the fact that their PPTB or PTTTB did not align with that of others in their home. Having to figure out how to

navigate those moments when schedules did not align impacted adherence significantly. In the current study, REST participants experienced adherence as easier than when their partners adapted their own sleep schedules to accommodate the participants' new sleep schedule. Alternatively, when significant others' schedules stayed the same, adherence was experienced as more difficult. Previous research by Ellis and Troxel (2015) found that adherence to CBT-I is more likely when participants' significant others are willing to support adherence. The present study suggests that this willingness to support adherence may actually be a willingness of the people with the home environment to adjust their own sleep schedules to accommodate that of the individual participating in a CBT-I program.

Outside the Home

The present study also provided data for facets of the social environment outside of the home that acted as both supports and barriers to CBT-I adherence. Starting with supports, results indicate that the presence of the occupational therapist as the facilitator for CBT-I was the most significant. Participants viewed the occupational therapist as the expert in CBT-I and trusted in their expertise. This trust resulted in the development of a therapeutic relationship which, despite giving participants someone whom they were obligated to report instances of non-adherence to, also provided them with someone whom they could trust. The development of trust between participant and OT allowed for problem solving as obstacles arose. As participants were afforded the opportunity to admit that adherence was sometimes challenging and were met with a positive response from the OT rather than being shamed, they experienced a greater degree of control over their ability to adhere. Supporting the development of the therapeutic relationship that leads to open communication is important as it has been tied to better treatment outcomes for participants in cognitive behavioral therapy programs. (Hardy, Cahill and Barkham, 2007).

Furthermore, Self Determination Theory (Ryan and Deci, 2002) recognizes that supportive social environments have a role in encouraging self-motivated behavior. The results from the current study suggest that there may be a relationship not only between the therapeutic relationship and CBT-I outcomes, but between therapeutic relationship and motivation for adherence to CBT- I components and therefore, treatment outcomes. how the therapeutic relationship between CBT-I provider and participant can be used as a therapeutic tool to foster higher adherence rates.

In regards to barriers, the school environment was the most significant. The time pressure of meeting academic demands while attempting to maintain their sleep schedule as prescribed by the OT was challenging at times. Most students experienced the greatest difficulty adhering to their sleep prescriptions during finals week and the couple of weeks leading up to finals week. In having to meet more academic deadlines, prepare for more exams and develop/present more projects as required by their academic professors, participants felt as though their wasn't enough time to get everything done. The interaction between academic demands and time pressure of CBT-I most often resulted in participants missing their PTTB. Some participants experienced so many academic demands at times that they weren't logging any sleep at all, thereby not adhering to either the PTTB or PTOB. Kloss, Nash, Horsey and Taylor (2011) had previously identified limited time as a potential barrier to college students in obtaining behavioral sleep medicine treatments. When developing a CBT-I program targeting students, it is important to understand that as academic demands ebb and flow, so do participants' ability to adhere to program requirements. This study provided only preliminary data on the experiences of CBT-I participation and the impact being a student had on program adherence. Future research may focus on just exactly how academic demands as part of the social environment of participants

impact adherence in order to better understand this phenomena and develop programs better suited to support adherence to CBT-I in this population.

Bidirectional Relationship Between Activities and Routines

Within The Occupational Therapy Practice Framework, routines are “established sequences of occupations or activities that provide a structure for daily life,” (AOTA, 2014, p.S8). The framework sees routines as necessary to engaging in all occupations and activities. Therefore, understanding routines is essential in understanding and supporting the performance of any occupation. Unsurprisingly, the theme “Bidirectional Relationship Between Activities and Routines” emerged as a pertinent finding in the current study.

The first finding in regards to this category was that participants restructured their activities in order to help them adhere to SR, primarily PTTB. In restructuring the timing/order of their activity performance, participants were giving themselves something to do to occupy their time spent awake. Research by Kyle et al. (2011) had previously found that one factor impacting non-adherence in CBT-I programs was boredom resulting from spending more time awake than they previously had. The occupational therapist who facilitated REST prepped participants to be bored and aimed to combat this boredom by providing strategies for them to utilize. One of these strategies was to engage themselves in meaningful activity. Participants took this strategy and applied it by scheduling and developing new routines for activity performance as evidenced in the results of this study. The development of these new routines and activities then supported SR by giving participants a meaningful way to occupy their time until their PTTB. Results from the current study suggest that preparing participants to bored and providing strategies to overcome this boredom in order to support adherence to SR is an important way to support CBT-I adherence and thereby, effectiveness.

As participation in REST led to the development of new routines based on the need to adhere, some spoke about the impact this had on their ability to complete schoolwork, be a parent, and a partner. For example, as participants restructured their day, they now had designated times they used for homework completion and were getting everything done that they needed to academically. Viewed in this manner, the development of new routines lead to improvements in activity performance. Previously, Kielhofner and Burke (1980) found that routines are necessary in organizing behavior meaningfully and providing structure which supports increased efficiency in occupational performance. The daily structure that resulted from adhering to SR lead to an improvement in daytime activity performance for participants. This is significant when viewed in accordance with research by Plach and Sells (2013) who identified that upon 30 young veterans' return to civilian life, most struggled with the occupations of relationships, school, physical health, sleeping and driving. Results from the current study suggest that adherence to CBT-I may actually work to address this issue by providing a set daily routine in which these activities are performed, leading to increased performance in a variety of occupations.

Finally, participants in the current study also provided evidence that their adherence to CBT-I components led to positive effects including increased concentration, focus and energy, which then had positive impacts during the performance of their daily activities and routines. These were captured by the First Cycle code of "daytime effects," and included examples such as increased ability to perform academically and socially. The recognition that adherence had an impact that extended beyond sleep addresses the DSM V's criteria that the presence of insomnia must result in some type of daytime impairment. These findings are significant due to the fact that the veteran population is significantly impacted by mental health diagnoses including

depression and anxiety (Troxel et al., 2014) and that occupational performance is negatively impacted by the presence of mental health diagnoses (Crist, Davis & Coffin, 2000). Results from the present study suggest that the routines which develop as a result of adherence to CBT-I may aid in decreasing symptoms associated with mental health disorders including difficulty concentrating, decreased energy and increased anxiety which go on to impact overall occupational performance.

LIMITATIONS AND FUTURE RESEARCH

Although this study provides important and novel qualitative findings regarding adherence to a multicomponent CBT-I program from the perspective of participants, there still exists a number of limitations. First, this study was conducted only with student veterans therefore, the results do not necessarily represent all college students or alternatively, all veterans. As a result, the ability to generalize findings directly to other populations beyond student veterans is limited.

As a study which sought to understand adherence, not gathering data from those who dropped out limits findings significantly. Dropping out may be evidence of an inability to adhere, however the current study did not collect any data in regards to this population and what factors influenced their nonadherence. However, the withdrawal rate of 12.5% reported in REST is significantly lower in comparison to the average veteran withdrawal rates in CBT-I programs of 20- 24% (Eakman et al 2017, Perlman et al., 2008; Troxel et al. 2014). Therefore, the data gathered in the current study represents a successful CBT-I program which may be important in supporting further CBT-I program development.

Based on the findings from the current study, there are multiple directions for future research. In regards to motivation, evidence for the various types of motivation as posed by Deci and Ryan (2002) were present. Knowing that autonomy is the driving force for moving along the motivation continuum has implications for better supporting CBT-I participants' in their attempts to adhere to program requirements. Future research could focus specifically on the impacts of autonomy on adherence by seeking to understand how changes in autonomy are experienced throughout participation in CBT-I programs and how autonomy can be supported. In

regards to the social environment, the current study supports previous research that recognizes this environment (both within and outside of the home) as a powerful influence on occupational performance as well as provides preliminary data regarding how it directly affects adherence to a multicomponent CBT-I program. Further research could more directly examine the social environment in respects to CBT-I. For example, by interviewing the significant others of those involved in a CBT-I program, researchers could better understand the role these individuals have on influencing their partners' adherence. Finally, in regards to activities and routines, the present study provided evidence for the practicality and purpose of using and developing new activities and routines to occupy waking time in order to support adherence. However, studies which focus directly on the role between activities and routines in supporting adherence to multicomponent CBT-I would greatly foster understanding that would allow CBT-I providers to better support participants through their use.

CONCLUSION

The results of the current study provide qualitative data regarding the experiences of college-enrolled veterans' participation in a multicomponent CBT-I program. This study has findings which confirm past research on adherence while additionally providing the qualitative perspective which has been lacking in present research. In regards to this new knowledge, the present study provides evidence for three categories that are present in understanding adherence to multicomponent CBT-I components and occupational effects resulting from participation: Extrinsic Forms of Motivation Influenced Adherence, Social Environment can Support or Hinder Adherence and Bidirectional Relationship between Activities and Routines. Guided by findings from the present study, CBT-I programs can be developed which take into account the factors that influence adherence and occupational engagement.

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APPENDIX A

Semi-Structured Interview Questions

Key Questions:

Rest (sleep is essential not only to our health and well-being but it also allows use to engage fully in our lives and what we find meaningful. Without rest we cannot remain engaged in life.

- What were your daily routines like prior to the REST program?
 - What was sleep like? How did it affect your daily activities?
 - When would you study? When would you take time for yourself? For others?
 - How would you describe a day when you didn't get good sleep? What impact would it have on getting things done, or enjoying what you were doing or feeling good about what you were doing?
 - Did you tend to nap?
 - What were your beliefs or thoughts about sleep?

- So early in the beginning of the program you went through a process called sleep restrictions. Think back to when you began the program - when you first got sleep restrictions....talk about what it was like when Natalie told you when you could go to bed and then also gave you very specific techniques (stimulus control) to follow.... to adhere to these restrictions.
 - Talk about your experience
 - What did you do to get through this “sucky” time?
 - Sometimes people use activities as a way to cope,
 - Sometimes people use beliefs or attitudes to cope...
 - How did your activities change during this time... quantity, quality, frequency, the meaning or importance of the activities
 - What did you do to stay up later until your time to go to bed”?
 - What activities did you engage in
 - Explore further....what do you do on the computer, is this something that is common for you to do....
 - Where there some activities that you found were more helpful than others?
 - How did you decide which activities you would spend time doing
 - When you were lying in bed and not sleeping how did you get yourself out of bed
 - What strategies did you use? These are from psychology today
 - Sensory.... Breathe in fresh air, listen to music
 - Pleasurable activities
 - Mental/mastery – try to challenge your brain in some way... read something, try a new activity, clean, do a word search or puzzle.
 - Spiritual - meditate, list things you are grateful for
 - Emotional – deal with emotions, laugh, cry, self-compassion
 - Physical – yoga, walk
 - Social – call someone, go to lunch
 - If you lived with other people, how did you negotiate making these changes...

- One of the specific stimulus control techniques you learned about was the idea that to sleep well at night you have to be active during the day.....
 - What did you do? –
 - How did you spend your time, or what activities did you do ? (see the above probes.
 - How did you stay awake? Or how did you stay active?
 - How did your routines change?
 - If you lived with other people, how did you negotiate making these changes...

- What are some of the other SC techniques you used...
 - How did you make them work for you?
 - Which were easier / which were harder?

- In some ways many of these SC techniques require you to create new routines or habits, which can be hard to do.....
 - We know that routines are critical and they help us live life more efficiently.
 - What parts of your routine have you kept that support your new behaviors
 - Some people often tie in new elements of routines to already established routines....
 - Sometimes visual cues can be helpful
 - What helped you make the changes?
 - Things you did
 - Motivations

- What changes have you noticed in your thoughts and beliefs about sleep?
 - What led to these changes in thoughts and beliefs?
 - Were you able to reframe the way you thought about sleep?
 - Were you able to reframe the way you thought about using your time during the day?

- If you were to describe the REST program, what aspects would be most important to you to talk about? Why?

- What was your experience with the REST program?
 - There were two main parts of the REST program - your 1:1 sessions with Natalie and the group time....
 - What did you gain from the 1:1 sessions?
 - What did you gain from the group sessions?

- How did you get yourself to complete the sleep diary every morning?
 - What made it easier or what motivated you to do it?
 - Were there certain things you did to help you (routines, environmental cues, thoughts used)

- Is there anything else you would like to share?

- If time, have each person end with brief sentence of something that they will take with them from the program...

APPENDIX B

Summary of First Cycle and Inductive Codes

<i>Code</i>	<i>Definition</i>	<i>Example</i>
Activity	what participants are <i>doing</i> Types: Social (with others), Physical (exercise, ex: walking) etc. Note: May be dual coded with routine or schedule	Ex: Keeping a sleep journal, when there is mention of “doing” things
Activity Pre	When activity is described prior to participation then “Activity Pre” is used	
Routine	<i>First</i> I do this this, <i>then</i> this	
Schedule	If word “schedule” is used Anything having to do with managing activities in the stream of time	
Sleep Restriction	going to bed and waking up at prescribed times, staying awake until bed time Note: Can include talk about these concepts before or during program participation	Ex: napping
Stimulus Control	limiting activities in bed to only sleep and sex, leaving the bed when you can’t sleep includes kids, pets, etc	
Social Environment	Any mention of people living within the environment that may support or hinder adherence	

	Can be outside living environment if it influences sleep	
Adherence		Note: Typically reflects adherence to sleep restriction or stimulus control
Group Format	Any reference to group	
1 on 1	Any reference to individual	“Natalie”
Meditation	any mention of mindfulness, meditation, and/or yoga	
Pre-Sleep Beliefs Can be coded as Pre Belief Can use Pre/Post if not clear	any mention of beliefs related to sleep drive, circadian rhythm, catching up on sleep, worrying about sleep before start of study	
Post- Sleep Beliefs Can be coded as Post Belief Can use Pre/Post if not clear	any mention of beliefs related to sleep drive, circadian rhythm, catching up on sleep, worrying about sleep after start of study	
Mental Health	includes any mention of anxiety, depression and/or PTSD	
Tools	Strategies or knowledge with utility or function/purpose	Ex:” Tools to help me...”, “I now know what to do.”, etc.
Pre Sleep Quality/Quantity Can be coded as Pre Sleep	includes any mention of sleep history, quantity/quality before beginning the program	Includes nightmares and dreams
Post Sleep Quality/Quantity Can be coded as Post Sleep	anything that changes in sleep quantity or quality that happened since beginning the program	Includes nightmares and dreams
Sleep Hygiene	controlling room temperature, employing noise control strategies, etc.	

Physical Effects	<p>Any somatic symptom, complaint or vocalization of resolution</p> <p>Note: Can clarify (ex. Pain)</p>	<p>Ex. Pain, weight gain, soreness, headaches etc.</p>
Program	<p>Any general reference to program that hasn't been captured by another code</p> <p>Contribution to research</p>	<p>Ex: "so the program has been a godsend."</p>
Daytime Effects	<p>Impact of sleep on daytime functioning</p> <p>Can be loss or gain</p>	<p>"concentrate"</p> <p>"energy"</p> <p>"focus"</p>