Home-Based Sleep Intervention and Behavioural Parent Training to Increase Compliance in a Ten-year-old Youth.
by
Abigail McNeilly

A thesis submitted to the School of Community Services in partial fulfillment of the requirements for the Honours Bachelor of Behavioural Psychology

St. Lawrence College
Kingston, Ontario
Canada.
April, 2018

Honours Bachelor of Behavioural Psychology
Dedication

For my mother.
I would not be who I am, or where I am without you.
Abstract
Children who receive insufficient sleep as a result of disruptive sleep patterns can experience detrimental effects on cognitive development, impacting learning, memory consolidation, and overall executive functioning of the brain; which can also relate to behavioural noncompliance (Mindell, Kuhn, Lewin, Meltzer, & Sadeh, 2006). In order to comply, it is required that the child attend to a command, create a plan to complete the task, keep the plan in working memory, and then behaviourally complete the task. The detrimental impact of improper sleep on these processes have been well researched and evidence shows that addressing sleep quality first can quickly improve overall functioning. The purpose of this study was to test the hypothesis that the use of a home-based sleep intervention paired with behavioural parent training would increase positive behaviours of sleep and compliance. One ten-year-old youth diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) and Oppositional Defiance Disorder (ODD) struggling with sleep disturbances and noncompliance behaviours participated in an 8-week program. Pre-test and post-test measures were used, which evaluated parent rating scores of positive sleep behaviours and compliance, on a 11-point rating scale with 0 being the lowest and 10 being the most ideal positive behaviours. Analyses examining the changes from the pre-test to the end of treatment indicated significant improvements in both parent ratings of child compliance and positive sleep behaviours. Results of the study suggest that the use of a sleep protocol prior to behavioural parent training for youth struggling with sleep disturbances and noncompliance can positively improve maladaptive behaviours. For future research, the use of a larger sample size with valid standardized measures would be beneficial for generalization and significance of results.
Acknowledgments

Firstly, I would love to thank my friends and family for their consistent love and support over the years. Especially to my mother, Janet Jarrell, who is my greatest inspiration in life. And to my BPsych family Colleen, Ainslie, Bee, and Lizzy. I would not have made it this far without you.

Secondly, I would love to thank the staff and clients from all three of my placement opportunities. I learned a great deal from each experience and I am truly grateful for the learning opportunities gained over the years. Each experience shaped me to be a better person as well as a better professional in the Behavioural Psychology field.

Thirdly, I would love to thank all of the staff members within the Behavioural Psychology Program. Each Professor contributed to my success and growth from the beginning all the way to the end of the program. I am forever grateful of the abundance of knowledge I gained through all of you.

Lastly, I would love to thank my college supervisor Dr. Melissa Bolton. Your support throughout my placement and further into my completion of my thesis was beyond helpful. I am so grateful for your prompt feedback, support, and knowledge over the last few months. Your contributions to my thesis and future in the Behavioural Psychology field are greatly appreciated.
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Chapter I: Introduction

The American Psychological Association (APA, 2017) estimates that approximately 60% of Americans report having sleep problems throughout the week; with 40 million suffering from over 70 different types of sleeping disorders. For children alone, it has been reported that over 2 million suffer from sleep disorders, with 69% under the age of 10 experiencing some type of sleep problem. Furthermore, it is estimated that 30%-40% of children are not getting the proper recommended amount of sleep (Cone-Health, 2012). It is well supported that receiving proper sleep is essential for one’s well-being and for overall physical and psychological health (American Psychological Association, 2017).

For children in particular, achieving quality sleep is critical for optimizing physical and mental development. During non-rapid eye movement (NREM), sleep hormones are released for growth and development, restoration of energy, muscle gain, tissue growth, brain development, and more (Weiner, Elkins, Pincus, & Comer, 2015). Children with sleep disruptions and who receive insufficient sleep can experience detrimental effects on cognitive development impacting learning, memory consolidation, and the overall executive functioning of the brain (Mindell, Kuhn, Lewin, Meltzer, & Sadeh, 2006). With regards to mood regulation, the negative impacts from a loss of sleep can be seen through chronic irritability and poor modulation of affect. Further, their attention and behaviours can change as observed through displays of aggression, hyperactivity, and poor impulse control (Mindell et al., 2006). Negative impacts regarding health can be seen through decreased metabolism and immune functioning and accidental injuries with an overall decrease in the quality of life (Mindell et al., 2006). These concerns are also linked to both emotional and behavioural difficulties such as anxiety, depression, attention difficulties and overall conduct behaviour (Wang et al., 2016).

During puberty, children undergo dramatic changes which naturally alter their sleep patterns (Thomas, Monahan, Lukowski, & Cauffman, 2015). There is a change in the circadian rhythm which leads to the desire to stay up later in the night and sleep in during the morning (Thomas et al., 2015). This shift in the sleeping pattern can lead to difficulties as it is incompatible with most school schedules causing an increase in day time fatigue (Thomas et al., 2015). The negative impact on sleep quality and quantity has detrimental impacts for youth due to psychological and biological changes that occur at this time (Thomas et al., 2015). Inadequate sleep can be associated with a variety of difficulties seen in pubescent children such as inattention, disruptive behaviours, impulsivity, impaired cognitive functioning, as well as academic and social difficulties (Weiner et al., 2015).

Similar behaviours can be seen in children diagnosed with Attention-Deficit Hyperactivity Disorder (ADHD) or Oppositional Defiant Disorder (ODD). Adolescents with ADHD usually have behavioural concerns with regards to sleep problems observed as difficulties initiating and maintaining sleep (Hiscock et al., 2015). It is estimated that 73% of youth with ADHD have significant sleep problems which may contribute to behavioural concerns, including noncompliance (Nelson, Van Dyk, McGinnis, Nguyen, & Long, 2016). Extended from these concerns, adolescents who experience sleep difficulties can have a negative impact on the family dynamic and well-being of the family members, potentially contributing to maternal depression, disruption of other family members sleep, and cause dysfunction to the family dynamic (Mindell et al., 2006).

ADHD is a neurobehavioral disorder that impacts 9-12% of youth world-wide and is characterized by inattention, hyperactivity, and impulsivity (Singh et al., 2010). Children who are diagnosed with ADHD may display problem behaviours such as aggression and
noncompliance (Singh et al., 2010). ODD can be defined as a persistent behavioural pattern of irritability and anger, as well as displays of argumentative and defiant behaviour towards authority figures (American Psychological Association, 2017). Children diagnosed with ADHD and ODD are generally more noncompliant with regards to parent-child interactions which has been linked to further severe behavioural concerns later on in their adolescent years such as difficulties at school or with the law (Johnston, Murray, & NG, 2007).

A standard treatment for ADHD is the use of pharmacotherapy, which uses stimulants such as amphetamines. However, studies suggest that the combination of behavioural therapy and pharmacotherapy are more successful compared to the use of one intervention alone (Singh et al., 2010). There is extensive literature that supports empirically based behavioural treatments for sleep problems and the multiple outcomes which occur from a lack of sleep (Mindell et al., 2006). In comparison to pharmacological treatment for such concerns, studies demonstrate that behavioural approaches are often more effective and socially acceptable to both the practitioners and caregivers (Mindell et al., 2006). The use of behavioural strategies over pharmacological treatments are more generalizable across settings and avoid potentially harmful side effects medications can cause for children mentally, physically, and biologically (Mindell et al., 2006). Therefore, this current study seeks to discover if pairing a sleep protocol with behavioural parent training in addition to medication to address noncompliant behaviours for children with ADHD and ODD will increase the likelihood of success for the intervention to resolve clinical concerns.

Chapter II: Literature Review

Sleep has been proposed as a potentially modifiable target that could lessen symptoms that are related to mental health disorders (Palmero et al., 2016). Research finds that inadequate sleep contributes to the onset, preservation, and recurrence of symptoms related to mental health conditions (Palermo et al., 2016). Karen, Smith, & Gordon (2014) explain that every aspect of the human functioning is virtually affected by sleep deprivation impacting one’s emotional well-being, impairing one’s physical health, jeopardizing public safety, and also could even contribute to mortality. Deep stages of sleep are required for the body to repair and grow. If not enough sleep is provided, then full restoration to function the next day is not possible or is limited (Karen, Smith, & Gordon, 2014). They note how in general medical clinics fatigue is reported as the number one most common symptom for patients. In 1994, it was estimated that the total annual cost of sleep problems, including lost productivity, in the United States (US) was 92.5-107.5 billion dollars a year (Karen, Smith, & Gordon, 2014).

Two main reasons why sleep is vital for the body, as noted by Karen, Smith, & Gordon (2014), are to allow for repair and restoration. During deep sleep, growth hormones are released which are needed for the repairing of micro-injuries which are sustained every day (Karen, Smith, & Gordon, 2014). They explain how without sleep, a deficiency in these hormones can lead to negative effects in the body such as aches, pains, and depressive symptoms. The neurotransmitters in the brain require sleep for restoration to keep the nervous system functioning properly and thus impacting serotonin, norepinephrine, and dopamine levels (Karen, Smith, & Gordon, 2014). When sleep deprivation occurs, levels in these hormones drop in the central nervous system leading to depression, anxiety, and heightened pain (Karen, Smith, & Gordon, 2014). Psychologically, effects of sleep deprivation can lead to reductions in the body’s vital functioning, concentration, enjoyment, well-being, coping and motivation (Karen, Smith, & Gordon, 2014). Behaviourally, an increase in accidents have been reported, an increase in depression, and a decrease in one’s overall quality of life (Karen, Smith, & Gordon, 2014).
Karen, Smith, & Gordon (2014) reported on a study of 691 participants who were untreated for insomnia. They found that 83% of these participants were easily irritated, upset, or annoyed. Of these, 78% of participants reported they were too tired to do things such as daily tasks, 59% reported they had trouble remembering things, and 43% reported that they were confused in their thinking. Sleep deprivation can lead to a reduction in the satisfaction of life, to unsatisfying relationships, reduce coping abilities, and impair the ability to enjoy life (Karen, Smith, & Gordon, 2014).

A standard treatment for sleep loss is to utilize pharmacotherapy, which is a medical treatment by means of drugs, such as melatonin (Maanen, Meijer, Smits, & Oort, 2011). Melatonin is a hormone that is secreted by the pineal gland, and has been linked to the regulation of circadian rhythms (Van Maanen et al., 2011). Melatonin has been proven to be an effective treatment option for sleep problems reported in both adults and children as stated by Van Maanen et al., (2011). Additionally, melatonin as a treatment option has been linked to improved effects on health, behaviour, and parental stress (Van Maanen et al., 2011).

A study conducted by Van Maanen, Meijer, Smits, & Oort (2011) in the Netherlands at a Centre for Sleep-Wake Disorders and Chronobiology focused on children referred for sleep onset problems. The participants consisted of 24 boys and 17 girls ranging in age from 5-12 who met criteria and were diagnosed with ADHD, five with autism, and one with concurrent diagnoses (Van Maanen et al., 2011). In the study, researchers focused on the use of melatonin which was started at a dose of one milligram per day with an increase allowed of up to five milligrams a day. They allowed an increase after four days of treatment if no changes occurred. After three weeks of treatment the dosage of melatonin was reduced by half, and the following week was discontinued completely (Van Maanen et al., 2011). Van Maanen et al. (2011) addressed five measures in the study: the child’s sleep which was recorded through a sleep diary, delayed dim-light melatonin onset (DLMO) which was determined through the child’s saliva, health which was determined through the first 14 items of the Function Status II, behavioural problems which was determined through the Child Behavior Checklist, and the parents stress which was determined through the Nijmegen Parental Stress Index Short Version. Baseline data was recorded on all measures prior to treatment. All measures were taken again after three weeks of treatment, and once again at the end of the stop week which was when the use of melatonin stopped. The results of the study showed the sleep duration and efficiency increased during the melatonin use and decreased once the melatonin was removed (Van Maanen et al., 2011). The health measure displayed an immediate increase after the three weeks of melatonin use, however at the end of the stop week the effects disappeared showing longer sleep durations are related to better health (Van Maanen et al., 2011). The behavioural problems also decreased during the melatonin treatment, although with regards to the parents stress no affect was made but it was noted that it may be possible parental stress could decrease with the maintenance of decreased behavioural problems (Van Maanen et al., 2011).

In addition to pharmacotherapy, some behavioural strategies as reported by Karen, Smith, & Gordon (2014) help with the promotion of positive sleep hygiene, through focusing on stimulus control, and through utilizing relaxation techniques can aid in targeting sleep problems. Sleep hygiene is defined as behaviours related to the process of sleep which can affect both sleep duration and quality either positively or negatively (Barber, Grawitch, & Munz, 2013). Negative sleep hygiene consists of interference behaviourally, cognitively, and environmentally (Barber, Grawitch, & Munz, 2013). Some specific sleep hygiene techniques suggested by Karen, Smith, & Gordon (2014) that improve sleep could include an enjoyable and relaxing routine put in place...
before bed. This can be achieved by reading a favourite book or by taking a hot bath. Set personal difficulties aside before going to bed, write them down or create reminders to deal with them tomorrow to allow calm thinking. They suggest to avoid naps during the day, as well as caffeine after 2 p.m. to avoid being alert late in the evening. Other sleep hygiene techniques suggested by Karen, Smith, & Gordon (2014) include physical activity, avoiding going to bed hungry or full, avoiding fluids after dinner to limit night time waking’s, as well as waking up and going to bed at the same time seven days a week to allow for the body to get into a regular routine.

A study conducted by Barber, Grawitch, & Munz (2013) hypothesized that poorer sleep hygiene would predict an increase in psychological strain, a decrease in self-control and a decrease in work engagement. They implemented the study through the use of an online survey which was sent out to 414 staff and faculty members at a University in the US, as well distributed the survey to 815 students who worked part or full time. A final sample size of 328 participants with ages ranging from 18-50+ years completed the online survey (Barber et al., 2013). Researchers focused on four measures in the study. First, sleep hygiene was reported on a 13-item Sleep Hygiene Index. Secondly, self-control capacity was reported on a 13-item Brief Self-Control Scale (Barber et al., 2013). Third, psychological strain was reported on a 10-item Perceived Stress Scale (Barber et al., 2013). Finally, work engagement was reported on a 9-item Utrecht Work Engagement Scale (Barber et al., 2013). Barber et al. (2013) reported the results of the questionnaire. The findings confirmed the hypotheses with poorer sleep hygiene being associated with high levels of psychological strain and low levels of work engagement and self-control. The study further confirms growing empirical evidence that connects sleep with self-regulatory functioning.

Following proper sleep hygiene, when addressing stimulus control which trigger sleep disturbances as suggested by Karen, Smith, & Gordon (2014) such technique involves limiting non-sleep behaviours in the bedroom. These suggested techniques include using the bed for only sleeping, relaxing, and sex. They suggest one is to only go to bed when drowsy and tired. If having difficulties sleeping after 10-15 minutes, they suggest one is to remove themselves from the room and read a dull book until you are drowsy again. As well, it is suggested to ensure the room is dark, quiet, and at a good temperature which is important for the body to be comfortable, clothes and sheets that are not binding are also important for comfort, and additionally a comfortable supportive bed is vital for proper sleep.

Relaxation methods suggested by Karen, Smith, & Gordon (2014) are used to train the body to mentally quiet any arousals such as stress and tension. Different methods are available and work differently based on the preference of individuals. To begin with, they suggest deep breathing, which consists of slow, diaphragmatic breathing to allow for optimal oxygen intake as a powerful tool to release negative and stressful thoughts in a calming manner. Further, progressive muscle relaxation is suggested by Karen, Smith, & Gordon (2014) which is used by tensing specific targeted muscles, followed by releasing them to allow for the body to focus on the difference between the feeling of tense and relaxed. Also, they suggest imagery which is another technique that involves mentally going to a beautiful, favourite, or preferred location through visualizing the landscape and details within focusing on the touch, smell, taste, and feeling of the imagined details. There are many more methods suggested such as, self-hypnosis and mindfulness with the main focus of all being on relaxing and calming the body and mind. Additionally, music can be paired with the methods to help induce relaxation through sounds of nature and calming vibrations depending on the preference of individuals.
A study conducted by Lohaus & Klein-Hessling (2003) posed the question whether children would benefit from relaxation training used to enhance coping behaviours. The researchers hypothesized that relaxation is an emotion-focused strategy which would decrease emotional and somatic relations to stressful events. There were 160 participants in the study with ages ranging from 9-12 years from four elementary and secondary schools located in Germany (Lohaus & Klein-Hessling, 2003). The participants were from the 4th and 6th grade comprised of different performance levels and from middle-class socioeconomic status to ensure a large representation of the children in the age groups (Lohaus & Klein-Hessling, 2003). They conducted the study during the student’s leisure time, so to prevent attrition and drop-out rates from the study. Further, the students were granted financial awards for participating in the entire program which may have contributed to the fact that all students completed the entire training sequence which was held individually. The study design formulated by Lohaus & Klein-Hessling (2003) included four training conditions, specifically progressive muscle relaxation, imagery, neutral stories, and arithmetic problems. The measures they used in the study included heart rate, skin temperature, and skin conductance levels which were used as physiological indicators for increased relaxation. These measures were recorded by them continuously through the use of a multi-channel polygraph. Additionally, subjective experiences during the sessions were assessed using a six-point self-report scale comprised of five items related to the participant’s mood, and five items related to the participant’s physical well-being (Lohaus & Klein-Hessling, 2003).

They study was conducted in a research lab for approximately 30-40 minutes weekly and began each session with a four-minute rest period to gain baseline data. Following baseline, they conducted one of the four treatment conditions for eight minutes which was implemented through an audiotape to increase standardization (Lohaus & Klein-Hessling, 2003). A three-minute follow-up period was then monitored by them. The ratings were taken before and after baseline, after training, and after the follow-up to gain data (Lohaus & Klein-Hessling, 2003). Lohaus & Klein-Hessling (2003) reported the study resulting in data showing significant improvements in mood and physical well-being as reported by the participants indicating that the method may be useful for children to apply relaxation for reaching the goal of inducing calmness.

A shared common concern seen across prevalent childhood disorders such as ADHD and ODD is noncompliance, for example not completing a given task, which is also a known concern in pediatric settings (Nelson et al., 2016). Behavioural interventions have been proven to demonstrate considerable effects to improve compliance through teaching parents and caregivers behavioral skills and strategies (Nelson et al., 2016). A study conducted by Mullin, Quigley, & Glanville (1994) aimed to research the impact of a parent training intervention on the mother’s reports of her child’s behaviour, and the impact on the mother’s psychological well-being which included self-esteem and social behaviours. As well they aimed to establish whether the impacts of the intervention have long-lasting results. The participants were comprised of 79 mothers ages ranging from 26-44 with 39 placed in the experimental group, and 40 in the control group (Mullin et al., 1994). The measures they used in the study were the Eyberg Child Behavior Inventory, the General Health Questionnaire, the Texas Social Behavior Inventory, and the Rosenberg Self-Esteem Inventory which were administered pre-test, post-test, and at a one year follow-up session for the experimental group. Mullin et al., (1994) reported the results of the study showed significant attitudinal improvement rates as well as fewer and less intense behavioural problems with regards to the children. For the mothers, an increase in self-esteem and social competence was reported, as well as reports of better family and community
relationships (Mullin et al., 1994). An increase in the awareness of the parental role, self-awareness, self-confidence, and increase in self-esteem were also reported by Mullin et al., (2003). Parents were better able to relate with their child and deal with the behavioural problems effectively (Mullin et al., 2003). They reported that the study demonstrated a positive relationship between the intervention and the implication on the mothers and their children showing a significant effect as a treatment method.

Additionally, more empirical evidence for behavioural parent training is displayed in a study conducted by Pisterman et al., (1992) in the Psychology Department of Children’s Hospital in the eastern regions of Ontario. They researched whether parent behavioural training could address compliance and attention deficits in preschoolers with Attention Deficit Disorder with Hyperactivity (ADDH). Out of the 95 families that met the criteria, 57 agreed to participate in the study which was comprised of an experimental group and a control group (Pisterman et al., 1992). They reported that the study held 12 sessions which addressed education on ADHD, compliance training, shaping procedures, and used modeling/roleplay. The parents completed measures rating the child’s behaviours as well as a self-report which was assessed pre-treatment, post-treatment, and at a three-month follow-up session (Pisterman et al., 1992). Pisterman et al., (1992) stated that the results of the study showed an increase of compliance but had little to no effect on attention. Additionally, the parents reported an increase with success for parenting skills and with their parenting style as reports of an increase in positive feedback and a decrease in issuing directive demands were noted (Pisterman et al., 1992). They confirmed parent training to be an effective method for addressing compliance in children with ADHD as the percentage of compliance increased after treatment with a decrease in the time it took to complete a task commanded. Although they noted it did not address attention, it is possible the treatment is less effective for biologically driven behaviours which may need pharmacological interventions combined (Pisterman et al., 1992).

As empirical evidence supports behavioural parent training for noncompliance, it may not also target sleeping problems which are primarily comorbid with the behavioural concerns observed in those with ADHD and ODD (Nelson et al., 2016). Noncompliance broadly defined, may include disruptive and aggressive behaviours, oppositional defiance, and not following direction which can be addressed by altering parent behaviour to positively impact parent-child interactions (Nelson et al., 2016). The use of effective commands, positive attention, and contingency management skills can be implemented to gain child compliance (Nelson et al., 2016). Current evidence suggests that parent training programs based on cognitive and behavioural principles are reasonably effective in producing behavioural changes in children and these changes can also be seen with the parents and other family members (Singh et al., 2010). The use of behavioural parent training to address noncompliance is considered an evidence based practice. However, there remains room for improvement which can assist in fully resolving clinical behavioural concerns (Nelson et al., 2016). A potential solution to strengthen the intervention is to also address suboptimal sleep in children with ADHD and ODD to help increase compliance and adequate sleep through a combination of a sleep protocol and behavioural parent training (Nelson et al., 2016).

A study conducted by Nelson et al., (2016) was a preliminary evaluation of an intervention that included a brief sleep protocol and behavioural parent training. It was held in an outpatient mental health clinic in context of a broader behavioural treatment program for children who display noncompliance (Nelson et al., 2016). The study, as noted by Nelson et al., (2016) was comprised of three components which included the examination of the immediate
effects of the sleep intervention on the child’s sleep and compliance. An evaluation of the overall treatment as a combination, as well as an evaluation of the generalizability of the treatment across clinicians were addressed as there were multiple involved (Nelson et al., 2016). The participants in the study included 50 children and parents, who sought out services for noncompliance and disruptive behavioural problems. The children ranged in age from 2-16 years (Nelson et al., 2016). They stated that less than half of the children in the study were taking at least one prescribed medication at the beginning of treatment and were asked not to change the dosage unless prescribed otherwise by their own physician. They noted that by the end of the treatment eight changes to children’s prescriptions had been made, three of which were reductions. Of the children participating, 66% had a disruptive behaviour disorder, 64% had ADHD, 8% had an anxiety disorder, and 4% had a mood disorder (Nelson et al., 2016). The treatment program began with the sleep protocol and included psychoeducation on sleep needs for children, bedtime routines, regular sleep schedules, promoting healthy sleep hygiene, and eliminating sleep interfering behaviours (Nelson et al., 2016). They then described how this was followed by the behavioural parent training protocol with some topics involved being teaching the parents how to provide differential attention based on positive and negative behaviours, effective commands, and shaping of behaviours. The treatment program was expanded across eight sessions based on a case-to-case basis for family needs with ten days in between each session (Nelson et al., 2016). The measures they used included a parent rating of the child’s sleep on an 11-point rating scale with 0 being the worst it can be, to ten being the best it could be. At the beginning of the treatment the mean score was 3.89 (Nelson et al., 2016). Another measure used was the parents rating of the child’s compliance on an 11-point rating scale with 0% being never complies, to 100% being always complies (Nelson et al., 2016). Compliance in the study was defined as “When telling your child to do something he/she does not want to do, but does it anyways, initiating within 10 seconds of initial direction” by Nelson et al., (2016). The mean score for compliance at the beginning of treatment was 1.81 with a goal of 7, with 70% as the percentage reflecting typical compliance rates across gender, age, and cultures (Nelson et al., 2016). They noted that the results of the study indicated a significant and immediate increase in the rating of the child’s sleep after the sleep protocol with an average increase of 3.21 points on the scale. As an overall rating, the parents rating of child’s sleep increased by an average of 4.21 on the 11-point scale (Nelson et al., 2016). For a change in compliance following the sleep protocol, an immediate average increase of 2.35 points was achieved, followed by a significant average increase of 5.25 for the total improvement at the end of treatment (Nelson et al., 2016). Therefore, they concluded, the evaluation of the combination of brief sleep protocol and behaviour parent training treatment program suggests considerable promise for addressing children with sleep and noncompliance difficulties with immediate improvements after the sleep protocol and further improved success after the combined treatment.

Through empirical evidence on pharmacotherapy, sleep techniques, and evidence on the use of behavioural parent training, it is likely the combination of a sleep protocol with behavioural parent training to address noncompliant behaviours for children with ADHD and ODD paired with medication as a holistic treatment will increase the likelihood of success for the intervention.
Chapter III: Method

Participant:
The participant taking part in the study was a ten-year-old male diagnosed with ADHD and ODD. The participant was an only child living in subsidized housing with his biological mother and maternal grandmother who co-parent him. This was the third living location in the last three years for the family. The participant was previously diagnosed by the family physician as having ADHD and ODD and was presently prescribed following psychotropic medications: Abilify 10 mg/day, Methylphenidate (Concerta) 18 mg/day, Clonidine 0.4 mg/day, and Melatonin 5 mg/day. The mother also reported having mental health concerns of her own including: severe anxiety and depression, adjustment disorder, insomnia, chronic pelvic pain, and dysmenorrhea as well had reported an incident of sexual abuse in her adulthood from a family friend. The mother reported that her son had behavioural concerns since the age of three and that recently, within the last month, he had been referred to a psychiatrist to update medications and diagnoses. The child participant had been through counselling and therapy as well as Intensive Child and Family services through a local Mental Health agency. Major concern areas reported by the mother were regarding his behavioural problems at home and at school. The participant had also been referred and accepted into the Nexus Program, which provides academic support and mental health treatment, at a local school which he was transferred into during the intervention. Recruitment of the participant was through a referral by a community counsellor to have an in-home community child and youth counsellor meet with the family to address behavioural concerns of sleep disturbances and noncompliance. The community counsellor’s role was to interview and evaluate the participant, refer to appropriate services, set goals and design strategies for treatment and help implement the strategies. The in-home community child and youth counsellor’s role was to support the family in home by providing mental health services to the family to improve functioning within the home, at school, and in the community. Prior to treatment, parental consent and child assent were obtained (Appendix A) as well as approval from the Research Ethics Board at St. Lawrence College (SLC) to implement the intervention (Appendix B). The purpose of the study, the benefits, risks, and information regarding confidentiality was outlined and described for the parents and child during an interview session and parents/child were provided with the opportunity to ask any questions or discuss concerns. The participant’s privacy and confidentiality remains protected to ensure any personal information cannot be identifiable unless required by law (e.g. suspected child abuse). A code was used to replace names and was to be used in the report, as well as on worksheets and assessments. The consent form was to be stored in a locked cabinet in a locked office at St. Lawrence College for 10 years after the child’s 18th birthday. All other research data was to be stored securely at St. Lawrence College for 7 years, after which time the data was to be destroyed. Any data entry or analysis was to be stored on a password encrypted computer that only the facilitators have access to. The results from the research as part of a thesis was to be made available at the St. Lawrence College library. It was also possible that the findings may be published in professional journals or presented at professional conferences, but any such presentations would be of general findings and would not breach individual confidentiality (no names or identifying personal information would be included). Signed consent forms, assent, and pre-test measures were obtained prior to the beginning of intervention. Post-test measures were obtained at the last session before completion of the intervention.
**Design:**

The study was a pre-test – post-test design using a parent rating of the child's sleep (Appendix C) and parent rating of the child's compliance (Appendix D) on an 11-point rating scale. Descriptive statistics were to be shown using tables presenting the mean, median, and standard deviation regarding sleep and compliance. The dependent variable was to be the child’s sleep and compliance, and the independent variable was to be the sleep protocol and behavioural parent training.

**Setting and Apparatus:**

The location of the intervention sessions took place at the participant’s home which was located in a subsidized housing unit in Kingston, Ontario. The area was known for violence in the neighbourhood with high police reports. The in-home community child and youth counsellor and the Behavioural Psychology student always attended the meetings together to ensure safety and supervision. The community counsellor and family had goals to move from the current location as the family felt targeted by surrounding neighbours through multiple verbal threats and physical violence, and felt unsafe in their home. The authorities were aware of the concerns and were monitoring the situation. Materials for each session were provided to the participants by the behavioural psychology student which included any necessary handouts, a pen, and rating scale measures.

**Measures:**

Measures used were a parent rating of child's sleep and parent rating of child's compliance on an 11-point rating scale which were to be completed by the behavioural psychology student through interviewing the parent. Descriptive statistics were to be shown using tables presenting the mean, median, and standard deviation regarding sleep and compliance.

**Procedure:**

The participant accompanied by the family met once, potentially twice depending on the needs of the family, weekly by the Behavioural Psychology student and in-home Child and Youth Counsellor for an average of 1-2 hours at the participants’ home either before or after school hours for 8 weeks. The intervention consisted of a sleep intervention and behavioural parent training, paired with teaching appropriate escape mands (verbal request to take a break from a task) to increase compliance and better sleep hygiene.

The participant was to be considered to have reached adequate sleep patterns when he maintained consistent sleep throughout the night. Based on his age a goal of 9 to 11 hours of sleep without leaving his bed and/or waking up others in time increments is recommended. The participant was to be considered to be compliant when he correctly followed instruction from his mother or grandmother within ten seconds (most commonly used time frame in the literature) that the instruction was delivered. Compliance behaviour was not to be considered occurring if he was already engaging in the activity when the instruction was delivered.

**Brief Sleep Intervention:**

The sleep intervention was brief taking place during 2 sessions for an hour and covered:
- Psycho-education for the parents regarding their child's sleep needs
- Cooperatively establishing positive bedtime routines
- Creating a regular sleep schedule for the child
- Reorganization to the child's bedroom to eliminate sleep-interfering behaviours
- Providing family with strategies for behavioural management of resistance and limit setting (sleep related)
Examples: showering earlier on in the night, taking TV out of room, creating steps for getting ready for bed, etc.

**Behavioural Parent Training:**
Behavioural Parent Training was covered over 6 sessions for an hour and covered:
- Provided knowledge/skills on differential attention for desired and undesired behaviours
- Provided instructions on giving effective commands
- Provided skills for shaping behaviours
Examples: minimizing choices, creating daily routines, rewarding appropriate behaviours, ignoring negative behaviours, etc.
Duration of behavioural parent training was to be session-by-session depending on the needs and progression of the child.

---

**Chapter IV: Results**

**Assessment Procedures and Results of the Functional Assessment:**

**GB Motivational Screening Tool (GBMST)**

The participants’ mother was interviewed on September 19th, 2017 using Barrera & Graver’s (2009) GM Motivational Screening Tool (Appendix E). The assessment identified the highest scored consequence of the problem behaviour as escape with a rating of 5.6 on a 6-point rating scale, with tangible scoring as the second highest with a rating of 4.6. The consequences of attention, sensory, and discomfort all scored below 4.0. With these ratings, the assessment identified escape and tangible as the main functions of his problem behaviour.

**Baseline Assessment:**

**Recording of Compliance and Sleep Ratings**

The participants’ behaviours of compliance and sleep was observed by the parent and measured using the 11-point rating scales (Appendix F). The behaviour was observed by the mother over the course of 8 days and data was collected on a self-report rating scale. During the baseline assessment, the participant displayed compliance for an average of 30.00% of the instructions. The participant also displayed positive sleep behaviours 32.50% during baseline.

Figure 1. presents the percentage of compliance and positive sleep behaviour ratings throughout baseline.

Stability is defined as 80%-90% of the data points falling within 25% of the median (Gast & Ledford, 2014), which is calculated as 12.5% above or below the median. The baseline data for compliance concluded to be stable as 100% of the data points fell within the 25% of the median. The baseline data were concluded to not be stable for sleep as only 75.00% of the data fell between 33.75% and 26.25% with the median being 30.00%. However, due to time constraints, the intervention proceeded.

**Intervention Results:**

The intervention for increasing compliance and positive sleep behaviours was implemented over an 8-week period, once a week (Appendix G). The intervention started on November 23rd, 2017 and ended on January 11th, 2018 and was effective in increasing compliance and positive sleep behaviours. During baseline the participants compliance averaged at 30.00% and 32.50% was recorded as the average for sleep. However, during intervention the participants compliance averaged at 66.25% which represents an increase of 120.83%. During the intervention, the participants sleep averaged at 70.00% which represents an increase of 115.38%.
The data for compliance proved to be stable during baseline by having 100% of the data points within a 25% range of the median value. Although the data proved unstable during baseline for sleep by having less than 80.00% of the data points within a 25% range of the median value, due to time constraints, the intervention was implemented. The trend line through intervention displays an increasing trend for compliance starting from as low as 30.00% during baseline and reaching as high as 80.00% during intervention (Figure 2., Appendix H) and as low as 30.00% for sleep with an increasing trend reaching as high as 80.00% during the intervention (Figure 3., Appendix I).

The percentage exceeding the median (PEM) technique (Ma, 2006) was used to calculate the effectiveness of the intervention as seen in Appendix H (Figure 2.) and Appendix I (Figure 3.). The PEM for compliance was done by calculating the median of the baseline data being 30.00%. A PEM line was then created through the baseline and intervention data. All 8 out of 8 data points for compliance during intervention as seen in figure 2. were above the PEM line calculating a 100.00% effectiveness, 8/8 = 1 X 100= 100. The PEM for sleep was done by calculating the median of the baseline data being 32.50%. A PEM line was then created through the baseline and intervention data. All 8 out of 8 data points for sleep during intervention as seen in figure 3. were above the PEM line calculating a 100.00% effectiveness, 8/8 = 1 X 100= 100.

**Treatment Integrity and Inter Observer Agreement (IOA)**

No data on treatment integrity could be collected, as the Behavioural Psychology student was the sole person to implement the training of the intervention for the parent to implement. The implementation of the intervention done by the parent for the participant was not observed daily as the meetings were once a week. IOA data collection was unavailable for the target behaviour during baseline and intervention as only the mother self-recorded data through self-interpretation of the behaviour.
### Table 1
Statistics on participants Target Behaviour

<table>
<thead>
<tr>
<th>Program Stage</th>
<th>Compliance</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
<td>SD</td>
</tr>
<tr>
<td>Baseline</td>
<td>30.00%</td>
<td>30.00%</td>
<td>0</td>
</tr>
<tr>
<td>Intervention</td>
<td>66.25%</td>
<td>70.00%</td>
<td>0.140</td>
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</table>

### Table 2
Statistics on participants Target Behaviour

<table>
<thead>
<tr>
<th>Program Stage</th>
<th>Sleep</th>
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<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
<td>SD</td>
</tr>
<tr>
<td>Baseline</td>
<td>32.50%</td>
<td>30.00%</td>
<td>4.63</td>
</tr>
<tr>
<td>Intervention</td>
<td>70.00%</td>
<td>75.00%</td>
<td>0.141</td>
</tr>
</tbody>
</table>
Figure 1. presents the percentage of compliance and sleep ratings throughout baseline and intervention.
Chapter V: Conclusion/Discussion

Thesis summary
As previously stated, quality sleep is critical for children for optimizing physical and mental development (Weiner, Elkins, Pincus, & Comer, 2015). The negative impacts on mood regulation from a loss of sleep can be seen through behaviour changes such as displays of aggression, hyperactivity, noncompliance, and poor impulse control (Mindell et al., 2006). Children diagnosed with ADHD and ODD display similar behaviours with 73% of youth diagnosed with the disorders having significant sleep problems which contribute to behavioural concerns such as noncompliance (Nelson, Van Dyk, McGinnis, Nguyen, & Long, 2016). The purpose of this study was to discover if pairing a sleep protocol with behavioural parent training to address noncompliant behaviours for a youth with ADHD and ODD would increase quality sleep and compliance behaviours. The community counsellor within the agency referred the client to have an in-home community child and youth worker due to behavioural concerns of sleep disturbances and noncompliance. The intervention implemented consisted of 8 weeks of individualized sessions first covering the sleep protocol, then behavioural parent training. The combination of brief sleep protocol and behaviour parent training treatment program has shown considerable promise for addressing children with sleep and noncompliance difficulties with immediate improvements after the sleep protocol and further improved success after the combined treatment (Nelson et al., 2016). This thesis evaluated the effectiveness of the 8-week program for a ten-year-old-boy with respect to changes displayed on self-report measures by his mother. Certain outcomes were expected, such as an increase in positive sleep and compliance behaviours. To determine the client’s outcomes and the effectiveness of the intervention, pre- and post-tests (self-report measures of parents rating of child sleep and compliance) were administered and the results were compared and analyzed.

The results from the parent’s rating of child sleep supported the hypothesis that the sleep protocol and behavioural parent training increase positive sleep behaviours and compliance by equipping the child and the parent with the appropriate skills to do so. The pre-test data showed an average score of 32.50% for positive sleep behaviours with the post-test score averaging at 70.00% representing an increase of 115.38%. The PEM calculations for the scores on sleep showed 100% effectiveness which interpret that the intervention was highly successful and therefore most likely positively changed the participants compliance and sleep behaviours.

The results from the parent’s rating of child compliance also supported the hypothesis that the sleep protocol and behavioural parent training increase positive sleep behaviours and compliance. The pre-test data showed an average score of 30.00% for positive sleep behaviours with the post-test score averaging at 66.25% representing an increase of 120.83%. The PEM calculations for the scores on compliance showed 100% effectiveness which interpret that the intervention was highly successful and therefore most likely positively changed the participants compliance and sleep behaviours.

The family members of the participant within the household expressed the positive improvements being displayed at the end of the intervention through discussion with the in-home community counsellor and behavioural psychology student. The mother expressed that less prompting and negative situations occurred throughout the day to encourage compliance and positive sleep behaviours giving the family more time to tend to other important matters and gain positive relationships within the home.
**Strengths**

The evaluation of an evidence based sleep intervention and behavioural parent training program implemented at home suggests considerable promise in addressing sleep disturbances and noncompliance. The results showed immediate improvements through the use of the parent rating measures of sleep and compliance. It was expected that addressing sleep problems which negatively affect child behaviour and the cognitive processes underlying behavioural control, would lead to immediate improvements of ratings. To comply, it is required that the child attend to a command, create a plan to complete the task, keep the plan in working memory, and then behaviourally complete the task. The detrimental impact of improper sleep on these processes have been noted and evidence shows that addressing the sleep first can quickly improve overall functioning.

The immediate improvements shown are important for not only increasing desired behaviours, but as well for the parents of the children who are often frustrated by the significant behaviour concerns, the impacts from the behaviours and from the time it takes for referral and to finally begin an intervention. Having rapid relief from the behaviours may help with the treatment integrity and reduce dropout rates.

In addition to the immediate improvements from the sleep intervention sessions, continuous improvements are shown when the intervention is combined with the behavioural parent training. Delivering the behavioural parent training following the sleep protocol may help enhance the improvements of the sleep protocol by reinforcing more generalized behaviour management skills that can be relevant to sleep-behaviours.

The client and family provided full engagement as no sessions were cancelled, rescheduled, or missed. The family was also provided extensive support from multiple areas within the agency as they had been provided other resources throughout previous years. As well, the behavioural psychology student attended every in-home meeting with the community counsellor and in-home counsellor allowing for a positive trusting relationship to be built.

**Limitations**

Several limitations can be noted, with the main limitation being the sample size. The intervention was a case study as there was only one participation, therefore the results do not provide a good representation for youth males in general. Although positive results were indicated supporting the hypothesis, a larger sample size would provide a better representation for the population. In addition to a larger sample size, generalization across gender would be optimal.

A second limitation can be seen in the data collection measures used in the study as both were self-reports. Parent ratings potentially could have been subject to bias and skewed based on answering what was more rewarding or socially desirable or reflect the parents distress and concerns as perceptions of the behaviours.

Thirdly, the short duration of the intervention can be noted as a limitation. During the behavioural psychology students time on placement, a strike occurred at the College which denied the student the ability to begin the intervention. The strike lasted 34 days which determinately impacted the time available to implement the intervention. Better results may have occurred and more substantial data may have been collected from the program if it lasted more than 8-weeks.

A fourth limitation that can be noted was that a follow-up was not conducted which may have provided evidence of continued positive and longitudinal change.
Lastly, although the sleep intervention provided support and useful guidance for addressing common sleep disturbances, it cannot address major sleep issues that require medical interventions.

**Multilevel Challenges**

When implementing any intervention, especially an individualized program, many challenges may arise. The duration of an intervention is crucial for progress to not only be made, but to have lasting effects and to show statistical analysis of improvements. Having limited time to meet with a client, limited time to implement a session, as well as limited time for the completion of an intervention can cause multiple difficulties across levels such as the client level, program level, organizational level, and societal level.

**Client Level**

On a client level, having limited time between a client and the counsellor has many negative effects. Relationship and therapeutic rapport building tasks time as trust is needed between people to be open, comfortable, and motivated. The in-home worker scheduled sessions with the family only once a week for an hour which limited opportunity for relationship building to occur. The behavioural psychology student attended every meeting with the family, community counsellor, and in-home counsellor to optimize opportunities to help gain a relationship with the client and build therapeutic rapport.

**Program Level**

On a program level, having limited time to implement a program can impact the progress and overall effect of the program. Due to the limitations resulting from the strike, only 8-weeks was available to implement the intervention. Every individual is different, and some people may need more time and in-depth implementation to fully understand and grasp training. Extra time would not have been available if the in-home worker was not able to schedule additional sessions during the week which would limit the full effect of the intervention.

**Organizational Level**

On an organizational level, having a limited number of service providers for the number of needs for individuals can be a huge issue. Waitlists are a common concern for clients and impede on the urgency to address the needs of the clients. If clients are being put through programs that are available because other service providers are full this can lead to not addressing their specific needs putting them behind from addressing their issues as well as puts others who are appropriate for the program behind as they have to wait for an opening to receive the service.

**Societal Level**

On a societal level, if clients are not provided with the appropriate service treatments to address their needs, the problems will continue to increase and can do further damage. Waitlists can put clients back for years before they are admitted into programs and if provided unfit services this can lead to program drop outs, or another referral onto another waitlist once again putting the client back. The longer it takes for a client’s needs to be met, the further the damage can be mentally, emotionally, and physically, impacting every aspect of their life and the lives around them. This is why it is important clients are provided with the appropriate treatment programs as quickly as possible and for the appropriate time needed.

**Contributions to the Behavioural Psychology Field**

The contributions to the Behavioural Psychology field can be seen through the outcomes of the study which demonstrated that youth with ADHD and ODD who have difficulties regarding sleep and compliance could benefit from a home-based sleep intervention and
behavioural parent training program. Results from the study also demonstrated that behavioural change could be made in a short period of time and also in a non-intensive setting.

**Recommendations for Further Research**

Recommendations for future research can be for the use of a larger sample size for generalizability across age and genders and would provide more valid, concrete, and reliable statistical results. The use of objective, evidence-based and standardized measures should be used for sleep and compliance in replace of self-report rating scales to allow for valid results and comparisons of data. Also, a follow-up session should be incorporated to ensure the intervention has lasting effects on the client with regards to positive sleep and compliance behaviours accompanied with a feedback form to provide qualitative data and potentially influence the social validity of the intervention.
References


Appendix A

Informed Consent for Parent/Guardian(s)

St. Lawrence College
100 Portsmouth Ave.
Kingston, Ontario K7L 5A6

Project Title: Home-Based Sleep Intervention and Behavioural Parent Training to Increase Compliance in a Ten-year-old Youth.

Principal Investigator: Abigail McNeilly  Agency Supervisor: Lindsay Stewart

College Supervisor: Dr. Melissa Bolton  Name of Institution: St. Lawrence College

Name of Agency: Pathways for Children and Youth – Intensive Child and Family Services

Dear (Parent or Guardian),

I, Abigail McNeilly, am a placement student in the Honours Bachelor of Behavioural Psychology Degree program (BPSYC) at St. Lawrence College. This degree program focuses on a behavioural approach, which has been proven to be effective in developing and improving on life skills with a wide variety of clients in various settings. You and your child have the opportunity, if you consent, to take part in a clinical intervention in which further detail will be provided below.

About the project:

The purpose of the intervention is to use a brief sleep intervention and behavioural parent training which aims to increase compliance and promote healthier sleeping habits. Data will be collected using pre-test and post-test checklists to record changes in behaviour from before and after the intervention takes place to provide research based evidence of success.

What will you be asked to do if you take part?

If you choose to consent for your child to partake in the program you will be asked to meet with the behavioural psychology student and in-home child and youth counsellor 1-2 times weekly for 8 weeks, set goals with your child weekly for pro-social behaviours, use positive reinforcement to encourage positive behaviours, rate compliance and sleep behaviours, partake in behavioural parent training, as well as accept escape mands from your child when needed.

Potential Benefits:

Potential benefits of taking part in the intervention could include an increase in positive sleeping habits, increase in compliance, could decrease acting out behaviours and could cause positive
improvements on the family dynamic, environment, and physical well-being. Potentially, the benefits could generalize across multiple settings such as at the school and in the community. The participant may also appreciate knowing that their participation will help towards a research thesis project to help further a student’s education and completion of a degree program. Potential disadvantages or risks that can be associated with the program may include experiencing negative emotions such as frustration and/or anger which will be addressed by teaching coping strategies. If you or your child becomes uncomfortable or distressed the behavioural student, or faculty supervisor will personally be of assistance to address any concerns immediately.

**Privacy and Confidentiality:**

For confidentiality, all personal information will remain private unless required otherwise by law (for safety of yourself or your child). All names and personal identifiers will be changed to protect you and your child’s privacy. The consent and assent will be stored in a secure locked cabinet at St. Lawrence College for 10 years, and for your child’s, an additional ten years after their 18th birthday (as per policy). As well, all research data and information regarding the program will be stored at St. Lawrence College for 7 years, in which after will all be permanently destroyed. The research program, as a part of my thesis, will be available to St. Lawrence College and may be published in professional journals or discussed and presented at behavioural conferences. If so, all information provided will be of general findings and not breach confidentiality of your private information. No names or identifying information will be used.

Participation in the program is voluntary. You and your child have the right to refuse consent and not partake in the program without being penalized in any way. If you do consent, it is your right to withdraw at any given point without reason required or with-hold from partaking in any part of the program you wish to be excluded from without penalty. If you or your child wishes to withdraw from the program, please contact either I or the faculty supervisor and all of your personal data will be destroyed and removed from the study.

If you have any questions about this study you may contact either myself at amcneilly22@student.sl.on.ca or my SLC supervisor, Dr. Melissa Bolton at melissa.bolton@royal.ca, if at any point you have questions or concerns regarding your rights as a research participant, you may contact the SLC-REB chair at reb@sl.on.ca.

If you agree to you and your child participating in the project, please complete the form at the bottom of this letter and return it to me as soon as possible. I sincerely appreciate your cooperation.

Sincerely,

Abigail McNeilly - Honours Bachelor of Behavioural Psychology Degree Placement Student
Parent Consent Form

September, 2017

I understand and consent to the information on the previous page.

Name: ____________________________

NOTE: Your child has the option to refuse participation if they do not agree to provide assent. Verbal assent must be provided from the child after you have provided consent.

NOTE: All information identifying the client will be removed from any reports to protect confidentiality

- _____ I consent for me and my child to participate in the intervention/project conducted by BPSYC Student.
- _____ I have been provided with a copy of the consent form and fully understand it after it has been reviewed to me.
- _____ I consent for the data collected as part of this intervention/project to be presented at a conference.
- _____ I consent for the data collected as part of this intervention/project to be published in a peer reviewed journal or professional publication.

Participant Name: _______________ Signature ___________ Date: __________ 

Witness Name: _______________ Signature ___________ Date: __________ 

Placement Student Name: ___________ Signature ___________ Date: __________
Hi. My name is Abigail McNeilly and I am a student at St. Lawrence College. I am doing a research project and would appreciate if you could help. If you choose to help me by participating in my research project, you will play a part in expanding knowledge on behavioural techniques such as goal setting and positive reinforcement that help increase good behaviours.

The choice is yours; you can either say “yes” or “no” to participating. If you choose to say “no” no one will be upset, and if you say “yes” you can change your mind at any time.

If you choose to say “yes” and participate in the study I will not identify you or anything you tell me. During the study, you will be asked to set goals for yourself to achieve each week to help with doing tasks and to avoid acting out behaviours like tantrums.

Do you have any questions or concerns you’d like to address before making a decision?

Thank you for deciding to help me out with my project, I am grateful for your
Appendix B

Research Ethics Board Approval

October 10, 2017

Student name: Abigail McNeilly
Student address: amcnneilly22@student.sl.on.ca
766 John Counter Blvd, Kingston, ON, K7K 6P1

SLC-REB Reference Number: 2017-REC17MA

Project Title: Home-Based Sleep Intervention and Behavioural Parent Training to Decrease Noncompliance in a Ten-Year-Old Youth

Dear Abigail McNeilly:

I am writing to advise you that the Research Ethics Committee – Psychology (REC-P), a subcommittee of the St. Lawrence College Research Ethics Board (SLC-REB), which has been delegated the authority to review and approve SLC Bachelor of Behavioural Psychology students’ thesis research protocols, has reviewed and found [Student’s name] thesis research protocol to exceed or satisfy the minimal requirements for the ethical conduct of research involving human participants as put forth by the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans (TCPS2, 2014). You may now begin your participant recruitment at your earliest convenience.

You have six (6) months to complete the project from the time of approval. Should you require more time to complete your project, you will be required to submit a SLC-REB Request for Renewal Form. This must be submitted prior to SLC-REB approval anniversary date. If you are proposing changes to your approved project then you will need to submit prior to implementing your changes a SLC-REB Request for an Amendment Form.

Please review St. Lawrence College’s Policy on Research Integrity. You are obligated to keep your files up to date and inform the SLC-REB of any changes to your study.

Any adverse or unanticipated events during the course of your research must be reported to the SLC-REB as soon as you become aware of them. The SLC-REB reserves the right to review your file at any time to ensure that research is being conducted in accordance with all applicable SLC Policies and the TCPS2 (2014).
Once your project is complete, you are required to complete a Project Completion/Termination Form. This form must be submitted as a final report about your research to the SLC-REB by no later than April 02, 2018.

Best wishes for the successful completion of your project.

Best Regards,

Jamie, Morris-Pocock  
Chair, Research Ethics Board

cc: Marie-Line Jobin, REC-P Chair
Appendix C

Parents Rating of Child Sleep

Child’s Name: ___________________________

Parent’s Name: ___________________________

Observer: ___________________________

Date: ___________________________

On a scale from 0 to 10, 0 being as bad as it could be, and 10 being as good as it could be with no concerns, rate your child’s sleep by filling in one of the boxes below.

0 – □ (as bad as it could be)

1 – □

2 – □

3 – □

4 – □

5 – □ (room for improvement, concerns still primarily present)

6 – □

7 – □

8 – □

9 – □

10 – □ (as good as it could be, no concerns)
Appendix D

Parents Rating of Child Compliance

Child’s Name: 

Parent’s Name: 

Observer: 

Date: 

On a scale from 0 to 10, 0 being as bad as it could be, and 10 being as good as it could be with no concerns, rate your child’s compliance by filling in one of the boxes below.

0 – □ (as bad as it could be)

1 – □

2 – □

3 – □

4 – □

5 – □ (room for improvement, concerns still primarily present)

6 – □

7 – □

8 – □

9 – □

10 – □ (as good as it could be, no concerns)
Appendix E

GB Motivation Screening Tool

Client: N/A  Date: Sept.19/17  Interviewer: Abigail McNeilly

Informants' Relationship to the Client: Mother

Current or Past Diagnoses: ADHD/ODD

Behaviour Description (please define one only):
Non-compliant, screaming, yelling, hitting

How frequently does the behaviour occur? (circle the answer that best describes your observations)

- More than once a day
- Daily
- Twice a week
- Weekly
- Twice a month
- Monthly
- Less than once a month

Setting Description:
In home

Behavioural Intervention(s) being Implemented (if applicable):
N/A

Instructions: The GB Motivation Screening Tool is a questionnaire designed to identify those situations which influence the occurrence of behaviour problems. To complete this questionnaire select one behaviour that is of particular interest / concern. Once you have very specifically identified the behaviour, read each question carefully and circle the answer that best describes your observations in regard to this behaviour.

QUESTIONS

1. Does the behaviour seem to occur when you stop paying attention to the person in order to attend to another person or task?

   Never  Almost  Seldom  Half the Time  Usually  Almost  Always
   0      1       2X      3       4       5       6

2. When the behaviour occurs, you usually try to distract or calm the person with preferred activities (leisure items, snacks, toys, etc.)

   Never  Almost  Seldom  Half the Time  Usually  Almost  Always
   0      1       2       3X      4       5       6
If yes, please specify the item: Let him play game

3. Does the behaviour occur following a request to perform a task?  
   - Never 0
   - Almost 1
   - Seldom 2
   - Half the Time 3
   - Usually 4
   - Almost Always 5
   - Always 6

4. The person engages in repetitive "self stimulatory behaviours" such as body rocking, hand or finger waving, object twirling, etc.  
   - Never 0
   - Almost 1
   - Seldom 2
   - Half the Time 3
   - Usually 4
   - Almost Always 5
   - Always 6

5. The behaviour occurs more frequently when the person is in physical or psychological discomfort. If yes, please specify: _________  
   - Never 0
   - Almost 1
   - Seldom 2
   - Half the Time 3
   - Usually 4
   - Almost Always 5
   - Always 6

6. The behaviour occurs in the presence of others.  
   - Never 0
   - Almost 1
   - Seldom 2
   - Half the Time 3
   - Usually 4
   - Almost Always 5
   - Always 6

7. Does the behaviour occur if the person does not have his or her favorite items or objects?  
   If yes, please specify item: Video game  
   - Never 0
   - Almost 1
   - Seldom 2
   - Half the Time 3
   - Usually 4
   - Almost Always 5
   - Always 6

8. Engages in the behaviour to try to get people to leave him / her alone. (S)he wants to escape the person or the demands placed on them.  
   - Never 0
   - Almost 1
   - Seldom 2
   - Half the Time 3
   - Usually 4
   - Almost Always 5
   - Always 6

9. The behaviour occurs regardless of what is going on in his or her immediate area, and independently of his or her surroundings.  
   - Never 0
   - Almost 1
   - Seldom 2
   - Half the Time 3
   - Usually 4
   - Almost Always 5
   - Always 6

10. When the person has medical or psychological problems and these are treated, does the behaviour problem decrease?  
    - Never 0
    - Almost 1
    - Seldom 2
    - Half the Time 3
    - Usually 4
    - Almost Always 5
    - Always 6

11. Engages in the behaviour because (s)he enjoys being reprimanded or receiving negative
12. Engages in the behaviour to get access to items such as preferred toys, food, items, or drink. If yes, please specify item: _______.

13. Engages in the behaviour when he/she does not want to do something.

14. Would the behaviour occur repeatedly in the same way, for long periods of time, even if no one else was around?

15. The person has a history of recurrent physical or psychological problems that increase this behaviour.

16. Engages in the behaviour to try to get a positive or negative reaction from you or a peer.

17. Engages in the behaviour when you or a peer have something that (s)he wants.

18. Engages in the behaviour when (s)he does not want to do or stop doing something.

19. Engages in the behaviour because there is nothing else to do. The person is bored with or under-stimulated by his or her surroundings.

20. The behaviour occurs in cycles. During a "high cycle," the behaviour occurs frequently; during a "low cycle," the behaviour
rarely occurs. These cycles are caused by physical or psychological discomfort. If true, please specify the source of the discomfort: Before school/ before bed

21. Engages in the behaviour to draw attention to him or herself, or away from others. | Never | Almost | Seldom | Half the Time | Usually | Almost | Always |
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<td>3</td>
<td>4X</td>
<td>5</td>
<td>6</td>
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22. Engages in the behaviour when you or a peer takes something away that (s)he wants. | Never | Almost | Seldom | Half the Time | Usually | Almost | Always |
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23. The behaviour occurs in the presence of others. | Never | Almost | Seldom | Half the Time | Usually | Almost | Always |
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24. Does it appear to you that the person performs this behaviour because it is compelling or satisfying? | Never | Almost | Seldom | Half the Time | Usually | Almost | Always |
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4X</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

25. Engages in the behaviour because (s)he is in physical or psychological pain. | Never | Almost | Seldom | Half the Time | Usually | Almost | Always |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1X</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

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SCORING SUMMARY:

<table>
<thead>
<tr>
<th>Attention</th>
<th>Tangible</th>
<th>Escape</th>
<th>Sensory</th>
<th>Discomfort*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <em><strong>2</strong></em> 2. <em><strong>3</strong></em> 3. <em><strong>6</strong></em> 4. <em><strong>4</strong></em> 5. <em><strong>4</strong></em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. <em><strong>5</strong></em> 7. <em><strong>4</strong></em> 8. <em><strong>5</strong></em> 9. <em><strong>5</strong></em> 10. <em><strong>2</strong></em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. <em><strong>2</strong></em> 12. <em><strong>6</strong></em> 13. <em><strong>6</strong></em> 14. <em><strong>4</strong></em> 15. <em><strong>4</strong></em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. <em><strong>5</strong></em> 17. <em><strong>5</strong></em> 18. <em><strong>6</strong></em> 19. <em><strong>2</strong></em> 20. <em><strong>4</strong></em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21. <em><strong>4</strong></em> 22. <em><strong>5</strong></em> 23. <em><strong>5</strong></em> 24. <em><strong>4</strong></em> 25. <em><strong>1</strong></em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Total Score: 18 23 28 19 15
Mean Score: 3.6 4.6 5.6 3.8 3
Relative Ranking: 4 2 1 3 5

*Note: Discomfort refers to physical and/or psychological discomfort.

Appendix F

Baseline Assessment

<table>
<thead>
<tr>
<th>Date</th>
<th>Compliance Rating</th>
<th>Sleep Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>28-Sep-17</td>
<td>3/10</td>
<td>3/10</td>
</tr>
<tr>
<td>05-Oct-17</td>
<td>3/10</td>
<td>3/10</td>
</tr>
<tr>
<td>12-Oct-17</td>
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<td>4/10</td>
</tr>
<tr>
<td>19-Oct-17</td>
<td>3/10</td>
<td>3/10</td>
</tr>
<tr>
<td>26-Oct-17</td>
<td>3/10</td>
<td>4/10</td>
</tr>
<tr>
<td>02-Nov-17</td>
<td>3/10</td>
<td>3/10</td>
</tr>
<tr>
<td>09-Nov-17</td>
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<td>3/10</td>
</tr>
<tr>
<td>16-Nov-17</td>
<td>3/10</td>
<td>3/10</td>
</tr>
</tbody>
</table>

**Compliance:**

**Mean:** 3+3+3+3+3+3+3+3 = (24/80) X 100 = 30.00%

**Median:** 30.00%

**Stability** is defined by Gast and Ledford (2014) that 80-90% of the data points fall within 25% of the median, which is calculated by 12.5% +/- the median.

**Step 1:** 30.00% (median) X .125 = 3.75

**Step 2:** 30.00% (median) + 3.75 = 33.75%

**Step 3:** 30.00% (median) – 3.75 = 26.25%

All data points fall between 33.75% and 26.25% which means the data for compliance is stable, as 8/8 data points (100.00%) fall within 12.5% of the median. This does fit the Gast and Ledford (2014) standards for stable data.

**Sleep:**

**Mean:** 3+3+4+3+4+3+3+3 = (26/80) X 100 = 32.50%

**Median:** 30.00%

**Stability** is defined by Gast and Ledford (2014) that 80-90% of the data points fall within 25% of the median, which is calculated by 12.5% +/- the median.

**Step 1:** 30.00% (median) X .125 = 3.75

**Step 2:** 30.00% (median) + 3.75 = 33.75%

**Step 3:** 30.00% (median) – 3.75 = 26.25%

Six data points fall between 33.75% and 26.25% which means the data for sleep is unstable, as 6/8 data points (75.00%) fall within 12.5% of the median. This does not fit the Gast and Ledford (2014) standards for stable data.
Appendix G

Intervention Assessment

<table>
<thead>
<tr>
<th>Date</th>
<th>Compliance Rating</th>
<th>Sleep Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>23-Nov-17</td>
<td>4/10</td>
<td>4/10</td>
</tr>
<tr>
<td>30-Nov-17</td>
<td>5/10</td>
<td>6/10</td>
</tr>
<tr>
<td>07-Dec-17</td>
<td>7/10</td>
<td>7/10</td>
</tr>
<tr>
<td>14-Dec-17</td>
<td>7/10</td>
<td>8/10</td>
</tr>
<tr>
<td>21-Dec-17</td>
<td>8/10</td>
<td>7/10</td>
</tr>
<tr>
<td>28-Dec-17</td>
<td>7/10</td>
<td>8/10</td>
</tr>
<tr>
<td>04-Jan-18</td>
<td>7/10</td>
<td>8/10</td>
</tr>
<tr>
<td>11-Jan-18</td>
<td>8/10</td>
<td>8/10</td>
</tr>
</tbody>
</table>

**Compliance:**

Mean: \(4+5+7+7+8+7+7+8 = (53/80) \times 100 = 66.25\%\)

Median: 70.00\%

**Stability** is defined by Gast and Ledford (2014) that 80-90\% of the data points fall within 25\% of the median, which is calculated by 12.5\% +/- the median.

**Step 1:** 70.00\% (median) \times 0.125 = 8.75

**Step 2:** 70.00\% (median) + 8.75 = 78.75\%

**Step 3:** 70.00\% (median) – 8.75 = 61.25\%

There are four data points between 78.75\% and 61.25\% which means the data for compliance is unstable, as only 4/8 data points (50.00\%) fall within 12.5\% of the median. This does not fit the Gast and Ledford (2014) standards for stable data.

**PEM** is calculated by counting the number of intervention data points above the baseline median, divided by the number of data points in intervention, and multiplied by 100.

**PEM**

\((8/8) \times 100 = 100\%\)

By using the interpretation of Scruggs and Mastropieri (1998) on evaluating the effectiveness of the intervention, a score of 100\% suggests the intervention was very effective.

120.83\% Increase in Compliance

\(= (\text{Treatment Level-Baseline Level})/ \text{Baseline Level} = (66.25-30.00)\)

\(= 36.25\)

\(= (36.25/30.00) \times 100\)

\(= 120.83\%\)

**Sleep:**

Mean: \(4+6+7+8+7+8+8+8 = (56/80) \times 100 = 70.00\%\)

Median: 75.00\%

**Stability** is defined by Gast and Ledford (2014) that 80-90\% of the data points fall within 25\% of the median, which is calculated by 12.5\% +/- the median.

**Step 1:** 75.00\% (median) \times 0.125 = 9.37

**Step 2:** 75.00\% (median) + 9.37 = 84.37\%

**Step 3:** 75.00\% (median) – 9.37 = 66.63\%

There are six data points between 84.37\% and 66.63\% which means the data for sleep is unstable, as 6/8 data points (75.00\%) fall within 12.5\% of the median. This does not fit the Gast and Ledford (2014) standards for stable data.

**PEM** is calculated by counting the number of intervention data points above the baseline median, divided by the number of data points in intervention, and multiplied by 100.

**PEM**

\((8/8) \times 100 = 100\%\)

By using the interpretation of Scruggs and Mastropieri (1998) on evaluating the effectiveness of the intervention, a score of 100\% suggests the intervention was very effective.

120.83\% Increase in Sleep

\(= (\text{Treatment Level-Baseline Level})/ \text{Baseline Level} = (70.00-32.50)\)

\(= 37.50\)

\(= (37.50/32.50) \times 100\)

\(= 115.38\%\)
Appendix H

Visual Analysis of Compliance During Baseline and Intervention

Figure 2 presents the percentage of compliance throughout baseline and intervention with an increasing trend.
Appendix 1

Visual Analysis of Sleep During Baseline and Intervention

Figure 3. presents the percentage of sleep ratings throughout baseline and intervention with an increasing trend.