Stimulant Holidays in Children and Adolescents with ADHD: A Retrospective Study to Explore Variables in Parent and Prescriber Initiated Holidays

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Abstract

A stimulant holiday is an underutilized and under-researched intervention that could improve patient outcomes and patient and parent satisfaction to attention deficit hyperactivity disorder treatment. Given the pervasive nature of this neurodevelopmental disorder on social, familial, and academic functioning, it is important that treatment remain effective. A retrospective study with a target of 30 participants was conducted to examine parent or provider initiated stimulant holidays and the variables associated with each individual case. The variables analyzed were the duration of the holiday, the medication type, the date of the last dose change, duration of stimulant treatment, age of the patient, gender of the patient, and any other variables potentially impacting the stimulant holidays. Stimulant holidays for both provider and parent initiate holidays were common and holidays lasted between 2 and 14 days. Further research is indicated to explore patient outcomes of stimulant holiday and quality of life.

Keywords: ADHD, academic performance, stimulant, holiday, tolerance, adherence, effectiveness

Stimulant Holidays in Children and Adolescents with ADHD: A Retrospective Study to Explore Variables in Parent and Prescriber Initiated Holidays

In 2011, it was estimated that 6.4 million children in the United States were diagnosed with attention deficit-hyperactivity disorder (ADHD), a neurodevelopmental disorder characterized by inattention, impulsivity, and/or hyperactivity (American Psychological Association, 2013; Centers for Disease Control and Prevention [CDC], 2015). The presence of ADHD is marked by impairment in a variety of environments and is often associated with lower grade point averages and poor academic prognosis (Biederman, Spencer, & Wilens, 2004). Furthermore, the presence of hyperactivity and impulsivity can strain the family unit with disruption of family activities and frequent tension within the family occurring more frequently in families with children and adolescents with ADHD (Hansen & Hansen, 2006). The disruption to the individual and family unit caused by ADHD highlights the importance of continued exploration on treatment regimens and interventions.

The various side effects of stimulants caution prescribers to be conservative in prescribing to avoid potential adverse side effects while also balancing a dose that yields symptom relief, a difficult task when the medication appears to be ineffective. This may prompt the prescriber to explore a change in the type of medication, a change to a non-stimulant prescription, or consider a stimulant holiday, an intentional cessation of stimulant medication to address the possibility of tolerance.

Economic Significance: Local

The dropout rate of high school students in the state of Kansas fluctuated between 3.2 and 2.1% between 2000 and 2012 (U.S. Department of Education, 2015). Although the dropout rate for 2012 was the lowest in the last decade, there is improvement when the 2.1% in 2012 is

compared to the eight states that displayed rates under 2.0% (U.S. Department of Education, 2015). The prevalence of failure to graduate high school on time was found to be higher for students with ADHD than students with depression, social phobia, post-traumatic stress disorder, generalized anxiety disorder, and substance use disorder (Breslau, Miller, Chung, & Schweitzer, 2011). High school dropouts earn $10,386 less annually than their high school graduate peers, $36,434 less annually than those with an undergraduate degree, and experience a poverty rate of over 30 percent (Birnbaum et al., 2005). Early intervention may lessen these potentially preventable harships. Total cost in dollars to family members and caregivers of children, adolescents, and adults with ADHD in 2000 was estimated as $15.3 billion due to lost wages and time off work (Birnbaum et al., 2005). These costs speak to the pervasiveness of ADHD throughout the family system.

Diversity Considerations

Approximately 5% of children worldwide are affected with ADHD and the majority of studies have occurred in regions with similar prevalence rates such as North America and Europe (McGough et al., 2005; Pliszka, 2007). The prevalence is higher in male children, despite more female children presenting with a primary symptom of inattentiveness and ultimately prescribed central nervous system (CNS) stimulants (Barbaresi et al., 2006). Social standards in Western cultures hold female children to a higher standard of attentiveness while the same behavior in males may be attributed to *boys will be boys*, in which inattentiveness and impulsivity are universal traits in male children rather than rooted in pathology. This sentiment is echoed in the literature suggesting fathers of sons utilize stimulant holidays more often than other parent-child dyads (Barnard-Brak, Schmidt, & Sulak, 2013). Furthermore, the evidence available on stimulant use, adherence, and efficacy is comprised mostly of male children.

Review of the patient demographics from the current study site shows that established patients under the age of 18 diagnosed with ADHD are comprised of 58% male patients and 42% female patients. This ratio aligns with the morbidity data from the CDC (2015) on children between the ages of 5 and 17 in which 14.1% of boys were diagnosed with ADHD as compared to 6.2% of girls.

Problem and Purpose

Problem Statement, Purpose, and Improvement

Children and adolescents with ADHD face adversity in the classroom, both in academic performance and social functioning (Khoza, Oladapo, & Barner, 2011; Rodriguez et al., 2007). A stimulant holiday, which is not part of the standardized treatment guidelines, is an underutilized and under-researched intervention that could improve patient outcomes and patient and parent satisfaction to ADHD treatment. However, the American Academy of Child and Adolescent Psychiatry suggest in their ADHD practice parameters that an intentions stimulant holiday be used to assess stimulant necessity for patient's who have been symptom free (Pliszka, 2007).

This retrospective, descriptive research study explored the impact stimulant holidays have on parent satisfaction with treatment and examine variables between parent and provider-initiated stimulant holidays. This information will be helpful to the field of advanced practice psychiatric nursing as parents and guardians consider the quality of medication management as an important factor in determining treatment outcomes (Görtz-Dorten et al., 2011). Additionally, increased parent satisfaction of ADHD treatment is associated with improved adherence to the prescribed treatment protocols (Görtz-Dorten et al., 2011). However, a standardized treatment satisfaction measure or survey is not a component of the standardized treatment guidelines. Incorporating parent satisfaction remarks into the DNP study allows the investigator to learn

more about adherence to prescribed protocols that may be beneficial to the ADHD population at the study site.

Facilitators

Facilitators for this study include the DNP student investigator's collaborating physician, the study site clinicians, the study site practice owner, and practice site office manager. Buy-in from these facilitators was key in garnering support for implementation of the study to further the field of advanced practice psychiatric nursing and quality patient care. The low- to no-cost of this study with assessment measures contributed to the sustainability of the study following the initial DNP implementation.

Barriers

Although stimulant holidays are widely used in the practice of stimulant prescribing for the treatment of ADHD, stimulant holidays are typically used to allow the child to gain weight (Pliszka, 2007). Additionally, stimulant holidays are also used to assess symptom severity in the presence of CNS stimulants in order to determine the necessity of the stimulant use in an individual's ADHD treatment. This current study explored the primary variables of medication type and time lapsed since last dose change, and these variables were compared in children who underwent a provider initiated stimulant holiday or a parent initiated stimulant holiday. Specific barriers within the retrospective content was a potential knowledge deficit among providers on stimulant holiday. Prior to collecting the study data, the variables associated with stimulant holidays were discussed by the investigator and clinical practice colleagues.

Review of Evidence

Inquiry

The following clinical inquiry was posed for this study: in children and adolescents ages 6 to 17 with attention deficit hyperactivity disorder, how do parent-initiated holidays compare to provider-initiated stimulant holidays?

Search Strategies

In reviewing the literature, the search was limited to studies published from 2004 to 2016. The research that addressed the inquiry consisted of 34 total studies and evidence based guidelines: 6 Level I evidence, 11 Level II, 15 Level IV, and 2 Level VII (Melnyk & Fineout-Overholt, 2015). The databases searched were CINAHL, Medline, PsychInfo, PubMed, and Cochrane databases with a combination of the terms ADHD, academic performance, stimulant, holiday, weekend, methylphenidate, amphetamine, tolerance, adherence, and effectiveness.

Evidence

Stimulant Medications Stimulant Medications

The literature revealed that symptom improvement may be rapid with stimulant medications, but overall functioning improves slowly although persistently with long-term treatment, emphasizing the need for consistent assessment of symptoms and adherence to treatment (Charach, Ickowicz, & Schachar, 2004; Frazier, Youngstrom, Glutting, & Watkins, 2007; Vitello et al., 2007). Maximal effects of symptom management are not immediate in extended release (ER) formulations, and early morning administration at home is likely to promote readiness for school, and thus, school performance (Brams et al., 2008). Increased cognitive processing with CNS stimulants may improve productivity, error processing, and on-task behaviors in the classroom, which is a phenomenon that could positively influence social functioning with increased self-efficacy and confidence (Powers Marks, Miller, Newcorn & Halperin, 2008; Prasad, Brogan, Mulvaney, Stanton, & Sayal, 2013; Rubia, Halari, Mohammad,

Taylor, & Brammer, 2011). Behavioral treatment tailored to home and school environments in combination with medication management is viewed as the ideal treatment for young students and is supported by national treatment guidelines (Hale et al., 2011; Hechtman et al., 2004; National, 2008; Pliszka, 2007; Wolraich et al., 2011).

In addition to assessing stimulant necessity, parents and providers may elect to institute a stimulant holiday during academic breaks or on weekends in an effort to avoid issues of tolerance (Pliszka, 2007). Stimulant holidays may serve as a proverbial reset button to address the development of side effects and/or assess symptom effectiveness in the absence of these drugs (Frazier et al., 2007; Graham et al., 2011; Howland, 2009). Furthermore, some parents and/or prescribers may elect to experiment with a stimulant holiday when adverse effects are suspected or reported. Stimulants can cause a reduction in appetite and subsequent weight loss, as well as insomnia. Research claiming that stimulants reduce vertical growth in children is controversial with no substantiated findings on the long-term effects stimulant medications have on height, yet height remains a factor when considering risk versus benefit in the administration of stimulants to children (Biederman et al., 2004; Buitelaar & Medori, 2010).

The review of literature revealed research with recommendations that did not support the use of stimulant holidays. Khoza et al. (2011) suggested that stimulant holidays may negatively affect treatment in some children, altering their quality of life with the varying symptom control precipitated by intentional breaks in medication. Moreover, although evidence shows stimulants positively affect academic improvement in children and adolescents, debate remains as to whether stimulant medications should be confined to use only for academic motivation (Biederman et al., 2004; Powers et al., 2008).

The need for consistent, effective ADHD treatment is vital to the sustained mental and

physical health of individuals with ADHD neurodevelopment disorder. Longitudinal research exposed a relationship between the presence of ADHD and a risky sexual history (Barkley, Fischer, Smallish, & Fletcher, 2006). Adults who were diagnosed with ADHD in childhood were reported as having more sexual partners, rarely or never using contraception, and experiencing a higher rate of unplanned pregnancies as compared to their peers without ADHD (Barkley et al., 2006). A link appears to exist between ADHD, gender, and unplanned pregnancies, and Barkley et al. (2006) reported that male participants in the ADHD cohort, which consisted of 98% heterosexual partcipants, had fathered an unplanned pregnancy at a significantly higher proportion as compared to the female participants with ADHD and unplanned pregnancy.

Although benefits are present to using a stimulant holiday to improve stimulant efficacy or temporarily combat unpleasant effects of stimulants such as appetite suppression and weight loss, some potential difficulties are encountered with stimulant re-administration (Buitelaar & Medori, 2010; Howland, 2009). When restarting medication post-stimulant holiday, students may have difficulty adjusting to the previous dose, and initially, loss of appetite and/or sleep disturbances may occur and persist with long-term administration (Charach et al., 2004; Khoza et al., 2011). This highlights a potential downfall to the use of stimulant holidays which includes regular stopping and re-starting of a medication. The physical discomforts of repeatedly beginning a medication may negatively impact the adolescent's physical comfort and may ultimately outweigh the possible behavioral and academic benefits (Charach et al., 2004; Khoza et al., 2011). Parent and teacher assessments of behavior are vital in determining the need for continued stimulant treatment or for a stimulant holiday; children and adolescents may not have the cognitive or emotional capacity to advocate for changes to their treatment (Perwein, Hall, Swensen, & Swindle, 2004).

Previous reports on the effects of un-medicated or under-medicated adolescents with ADHD emphasizes the importance of keeping ADHD treatment effective. Maximizing the dose of a stimulant is one method of increasing the effect and duration of action of the medication (Regnart et al., 2014). However, increasing doses past the recommended dose by the manufacturer and treatment guidelines places the adolescent at risk for undue physical side effects (Pliszka, 2007). Aside from increasing the dose of a stimulant past the upward limit of the recommended dose, stimulant holidays are an alternative intervention to revert back to the level of effectiveness that was once present (Regnart et al., 2014).

Academic Performance

The timing of medication holidays and parental and teacher perceptions of symptom management are considerations in ADHD treatment. Familial roles on Saturday and Sunday, may be more lenient than the expectations of these roles on Monday through Friday. Additionally, parents may hold academic performance in higher regard than behavior regulation at home. Therefore, parents may have a higher threshold for ADHD behavioral symptoms at home and on the weekends than they do for their child at school during a busy workweek (Martins et al., 2004). It is reasonable to conclude that difficult mornings or weekends at home may affect a child's temperament in the academic setting (Pliszka, 2007; Wolraich et al., 2011).

Despite support for stimulant holidays in the literature in combating acute tolerance with re-sensitization, when electing to institute stimulant holiday, professional discussion of intention, adherence, and monitoring is critical in assessing the holiday's effectiveness and managing symptoms (Buitelaar & Medori, 2010). Failing to administer stimulants a few times a week, which may result from forgetfulness or lack of prescription refills, are issues of adherence which can alter efficacy and even enhance potential side effects (Charach et al., 2004; Hugtenburg et

al., 2005). Furthermore, non-adherence has been associated with lower academic grades, specifically a GPA of 0.11 points less than adherent peers, and decreased treatment satisfaction (Görtz-Dorten et al., 2011; Langberg & Becker, 2012; Marcus & Durkin, 2011). Stimulant holidays are intentional interventions used as an assessment tool for parents, teachers, and prescribers to determine medication efficacy or relieve medication side effects. The distinction in intention between non-adherence and intentional stimulant holidays is important to identify as families of children and adolescents are increasingly engaged in self-directed stimulant holidays (Langberg & Becker, 2012).

Home Environment

A hallmark characteristic of ADHD is that symptoms are present and disruptive to multiple environments (American Psychiatric Association, 2013). Hansen and Hansen (2006) found that parents who reported positive changes in the academic environment also identified positive environmental changes at home. This relationship is likely due to decreased arguments and stress caused by poor academic performance and/or disruptive behavior in the academic setting. Furthermore, improvement in behavioral control allowed parents to report that verbal interactions with their child or adolescent were more meaningful and rational (Hansen & Hansen, 2006).

Parental Perception of Usefulness

Despite an extensive review of literature, no studies were identified that addressed the effects of stimulant holidays on patient or parent satisfaction of ADHD treatment. However, the results that can occur throughout the lifespan with under-medicated, poorly efficacious stimulant treatment could be an influential factor in parents viewing stimulant holidays as a positive treatment intervention. Existing evidence on the side effects of stimulants, non-adherence to

stimulants, and ADHD symptoms indicates the potential detrimental impact on physical health and financial cost to patients and their families throughout the lifespan (Birnbaum et al., 2005). It is estimated that $9.4 billion in excess cost went to untreated ADHD adults in 2000, which made up 58% of excess cost comprised of treated and untreated children and adults (Birnbaum et al., 2005). Comparing the $9.4 billion annual cost in 2000 with that of adults treated for ADHD at $3.6 billion highlights the nationwide financial cost of untreated ADHD (Birnbaum et al., 2005). These costs are likely associated with ADHD being reported as a risk factor for repeating grades as well as failure to complete high school (Birnbaum et al., 2005).

Theory

Imogene King, a nurse theorist, formulated the Theory of Goal Attainment. King's work was largely influenced by her philosophy that individuals who are flourishing are those working towards a clearly defined goal, and King used this worldview to posit that individuals need consistency in behaviors to attain these goals (Alligood, 2010; King, 1999). The original theory was derived deductively from King's own three-part conceptual framework and inductively from the idea that healthcare outcomes are driven by effectiveness of communication between patient and nurse (King, 1981; King, 1999). This theory places focus on the interaction between the nurse and patient, the interpersonal system or environment, and the goal achievement or health of the patient (King, 1981; King, 1999).

The rationale for using this theory for this study is that it focuses heavily on the nurse-patient dyad and the quality of communication and interaction between these two individuals. In advanced practice psychiatric nursing, the alliance between nurse practitioner and patient is initiated at the first appointment and sets the tone for the connection that will develop throughout the tenure of the therapeutic relationship (Wheeler, 2014). Because the outcome of the patient is

thought to be a culmination of several factors, including the practitioner's technique, the patient's expectations, and the presence of a quality alliance, Wheeler (2014) suggests that the process of *how* it is done is more important than *what* is done (p. 170). The goals of this theory depend greatly on the interaction between the nurse and patient, which align with the goals of psychiatric treatment.

Although the system and theory have not changed immensely since 1981, researchers have utilized the theory to further clarify the theory and concepts, making it increasingly applicable and generalizable to several populations and settings (Frey, Sieloff, & Norris, 2002). The Theory of Goal Attainment's process of interaction between the nurse and patient can be applied to this current research study although the theory is a complex middle range theory (Wayne, 2014; Appendix A).

Methods

IRB Approval, Site Approval, Ethical Issues, and Funding

University of Missouri, Kansas City Institutional Review Board (IRB) approved this research study. The retrospective study examined 30 medical records of children and adolescents known to have attention deficit (ADD) or ADHD and who were current patients of the student investigator who provided medication management services. The study also explored the duration of the holiday, the medication type, the date of the last dose change, duration of stimulant treatment, age of the patient, gender of the patient, and any other variables the student investigator identified to be useful in this study. Given the low cost nature of the study, no funding was necessary for this study.

Setting and Participants

The study site was a small, private, outpatient psychiatry practice in a city in Kansas. The participants were ages 5-17 who had received a diagnosis of ADHD or ADD through use of the Conners 3^{TM} within the last seven years, were a current client of the study location, had been treated with a CNS stimulant for at least twelve months prior to the study, and had undergone a stimulant holiday in the past. All participants received care by the student investigator who is a psychiatric mental health nurse practitioner. The parents were involved in the decision about implementing the stimulant holiday, and data was recorded about if the parent initiated the holiday in the manner prescribed by the provider or if the parent initiated the holiday during a date or timeframe determined by the parent.

Stimulant Holiday

If the provider assessed that the child or adolescent was a candidate for a stimulant holiday, which is defined by the American Academy of Child and Adolescent Psychiatry as having been on a simulant consistently for a least one year, the provider may have recommended a brief stimulant holiday to assess stimulant necessity or to cause a weight gain if clinically necessary (Pliszka, 2007). Parents were provided instructions for how to stop and re-start medication and had the ability to contact the provider with questions; the student investigator was the child's prescriber. The student investigator conducted a retrospective chart review to gather data about the most recent parent- or provider-initiated stimulant holiday (Appendix B).

Change Process

The change process supporting this study was Lewin's Change Model, a three-step model developed in 1951 to explain how change must progress in order to eventually become part of the process (Mitchell, 2013). The three steps are defined as unfreezing, moving, and refreezing and contain multiple strategies within each step to best address all facilitators, barriers, and goals

with this system (Mitchell, 2013). Mitchell (2013) draws comparison between Lewin's Change Model and the nursing process; both require a diagnosis of the problem and an assessment of the population's readiness and motivators for change (Mitchell, 2013). Lewin address that the initial unfreezing period is a crucial step in which those involved in the change process confront and process that change is both beneficial and uncomfortable (Mitchell, 2013). The first step in this change model, defined as unfreezing, is represented by the retrospective chart review focused on stimulant holiday.

Evidence Based Practice (EBP) Model

The EBP model supporting the exploration of stimulant holidays through a descriptive research study was the Clinical Scholar Model (CSM) which is described as a partnership between clinicians to bridge gaps in nursing knowledge or education (Fitzpatrick & Wallace, 2008). The concept of innovation is a key element of the CSM which aligns well with Lewin's Change Model (Appendix C); both place emphasis on the collegial cultivation on ideas for necessary change within a profession (Fitzpatrick & Wallace, 2008; Mitchell, 2013). The use of the CSM and Lewin's Change Model within this DNP study augments the study sustainability as each works together to foster an environment of critical reflection on necessary change and facilitates communication and education between specialties (Fitzpatrick & Wallace, 2008; Mitchell, 2013).

Design and Validity

This retrospective, descriptive research with one cohort was designed to study the children and adolescents who had ADD or ADHD and their parents to explore variables that may describe the current processes of stimulant holiday. One potential bias in data collection is that the student investigator, who was the provider, has authored and reviewed the medical records.

However, the data gathered from the medical records was subject to minimal interpretation and was primarily numbers, dates, and demographic information. The findings are limited in generalization due to the small sample size and participants from one health care provider.

Outcomes Measured

The variables collected and analyzed were the duration of the holiday, the medication type, the date of the last dose change, duration of stimulant treatment, age of the patient, gender of the patient, initiated by parent or provider, and other variables identified by the student investigator found to be useful in this descriptive study.

Quality of Data and Measurement Instruments

The sample size was 30 participants and, power analysis was not conducted due to small sample size. Despite the lack of evidence strength of descriptive research, the data collected provided information on how variables differed between male and female participants. Only the student investigator performed the data collection, and the de-identified data was entered into a work-specific, password-protected laptop. The screening list with medical record number was secured in a password-protected computer and purged after completion of the data collection. An Excel spreadsheet was used to collect data (Appendix D).

Statistical Analysis Plan

Descriptive research does not lend itself to a unique or rigorous data analysis plan. Data was gathered from the participant medical records, documented on an Excel spreadsheet, and thoroughly examined by the student investigator. From the data, connections and differences in the results were explored using descriptive statistics.

Results

Setting and Participants

The study took place at a small privately owned clinic in northeast Kansas. Participants were 30 children between ages 5-17 who had received a diagnosis of ADHD or ADD through use of the Conners 3^{TM} within the last 7 years, who were a current client of the study location, and who have been treated with a CNS stimulant for at least 12 months prior to the study and review of charts. The participants ranged from 11-17 years with a mean age of 14.5 years.

Intervention Course

The student investigator conducted the retrospective medical record review. Regardless of the time period variations of the stimulant holiday, which included either school days or school mandated break, data was collected between February 2017 and May of 2017 through the use of Practice Fusion, an electronic health record.

Stimulant Medications

The findings indicated that a greater number of participants took a break from an extended release medication out of school as compared to an immediate release while out of school. Additionally, extended release (XR) medications were more frequently utilized by participants as compared to immediate release (IR) medications. However, 10% of the participants were on a combination of both XR and IR medications.

Academic Performance, Parent or Provider Initiated

Sixteen percent of participants took a stimulant holiday while school was in session as opposed to during a school mandated break. Furthermore, those who took stimulant holidays while school was in session had a much shorter duration of holiday by about five days than those in the cohort. Parent initiated holidays during school lasted 2 to 7 days. In the cohort, 9% of female children underwent a parent initiated holiday while 47% of boys underwent a parent initiated holiday.

Home Environment and Parental Perception of Usefulness

In the data analysis, the word *difficult* was found within the body of the electronic health records or follow up appointments post stimulant holiday for 13 of the 30 participants. The student investigator was unable to determine if difficulty was noted by the participant, the parent, or both as it was not listed as a direct quote within the provider note. Nearly half of the participants used this word in some capacity to describe their stimulus holiday. This finding, although lacking validity in interpretation, is useful for prescribers with parents who may be considering a stimulant holiday for their child or adolescent. Discussing potential difficulties at home is paramount when the return of symptoms once treated by medication are imminent.

Discussion

Study Strengths and Successes

The major findings of this retrospective chart review is the timing of the stimulant holiday and person initiating the holiday. The sample size was small, and internal validity and generalization are limited although application to other similar outpatient psychiatry practices is present. Not only may this information be useful to the prescriber of stimulants for ADD or ADHD, the findings also may provide worthwhile discussion between the prescriber and their colleagues, many of them with overlap of patients on their caseload for therapy and medication management.

Results Compared to Evidence in Literature

Charach et al. (2004) suggests that long-term adherence to stimulants produces favorable effects. Additionally, the type of stimulant used was shown to be a factor in adherence and duration of treatment. Children prescribed XR formulations of methylphenidate, the most widely-prescribed stimulant, had a significantly longer duration of treatment during both school

and summer months as compared to patients prescribed immediate release methylphenidate formulations (Marcus, Wan, Kemmer, & Olfson, 2005). Ease of administration may play a role in the 37% longer duration of treatment time as extended-release formulations require once daily administration as compared to twice- to three-times daily dosage for immediate release formulations (Marcus et al., 2005). The published evidence is congruent with the current study findings which indicated that extended release formulations were most common among participants as a whole. Also, the current study participants experienced a longer duration since the prior stimulant holiday as compared to participants on shorter acting stimulants.

Conversely, stimulant holidays can also negatively affect adherence (Charach et al., 2004; Khoza et al., 2011). When restarting medication post-stimulant holiday, individuals may have difficulty building medication tolerance which may present with unpleasant side effects such as loss of appetite and persistant sleep disturbances with long-term administration (Charach et al., 2004; Khoza et al., 2011). The physical discomforts of repeatedly beginning a medication may take a toll on the child and parents and may ultimately outweigh the possible behavioral and academic benefits (Frazier et al., 2007; Howland, 2009; Khoza et al., 2011).

Limitations

External and Internal Validity Effects

The external validity may be affected by the study occurring in a private practice setting. In the practice setting of this study, children and adolescents are from privately insured families who have the financial means to access ADD and ADHD treatment services. Financial demographics were not recorded during the study, but the student investigator is aware that the lack of diversity in this study may impact the generalizability and external validity of the study findings.

Additionally, this practice location has a narrow scope of practice in terms of severity of mental health conditions with comorbid mental health conditions mild to moderate in severity. This may limit the findings to outpatient settings only and may not be applicable to patients with more severe and pervasive mental health conditions.

Sustainability

The practice of stimulant holidays will continue to exist in the current practice and can be easily replicated and implemented by providers in other similar practice settings. The ease of collecting data via an electronic health record allows fast and accurate assessment of outcomes.

Efforts to Minimize Limitations

The target population is considered vulnerable as the subjects were less than 18 years of age. As a descriptive study, data was collected on key variables published in the research on factors impacting stimulant holiday. Also, the convenience sample consisted of clients on stimulant medication during the past 12 months.

Interpretation

Expected and Actual Outcomes

The majority of participants were male patients (Appendix D) which aligns with the patient demographics from the study proposal site and shows that established patients under the age of 18 currently diagnosed with ADHD are comprised of 58% male patients and 42% female patients. This ratio aligns with the morbidity data from the CDC on children between the ages of 5 and 17 in which 14.1% of boys were diagnosed with ADHD as compared to 6.2% of girls (2015). The results provide a general picture of the practice site and the child and adolescent ADHD population as a whole.

Effectiveness

Prescribers must address potential effects a stimulant holiday may have on the family system. The possibility for reemerging symptoms with the initiation of a stimulant holiday should be considered a potential factor in a child's academic performance, as the tone of the environments often affect each other. Preparing parents and guardians for the possible impact of their child or adolescent's inattentiveness and impulsiveness may help them anticipate the challenges they may face and the behaviors to assess.

Study Revision

A useful revision to this study should would be to include participant interviews. In this current study, dialogue indicating perceived usefulness of the parent or provider imitated stimulant holidays could only be discerned by data taken from the electronic health record and not from the participant or parent directly. A pre- and post-simulant holiday would be given in a revised version of this study.

Impact

There was a difference between parent initiated holidays for boys and girls, with 9% of female children undergoing a parent initiated holiday while 47% of boys under went a parent initiated holiday. The answer to *why* questions may range from intensity of appetite suppression or weight loss, or perhaps parents of male children are more motivated to determine if the medication is necessary more often than parents of girl children. Regardless, there is a difference in treatment decisions between parents of male and female children and adolescents, and this may be investigated in future research.

Future Opportunities

The student investigator hopes to utilize this study as a foundation for future rigorous research. This would hopefully involve research to variables affecting grade point average of participants over a longitudinal study of 12 months or more.

Conclusion

Practical Usefulness of Study Findings

Being the parent or guardian of a child on medication for the treatment of ADD or ADHD may be a source of stress for many families. Treatment may require managing medication appointments, insurance claims, prescription refills, and adverse side effects (Hansen & Hansen, 2006). However, the results of an un-medicated child with ADHD can be just as stressful for family as symptoms of ADD or ADHD emerge or re-emerge (Hansen & Hansen, 2006). Given this situation, an important discussion to be held between family and prescriber involves the careful consideration of the child's potential sources of stress with the initiation of a stimulant holiday. The published evidence in maintaining effective stimulant therapy makes stimulant holidays a worthwhile intervention to explore in management of children with ADHD. The current study results provided the clinicians at the practice site information on parent's perception of the impact stimulant holidays might have on the treatment of their child's ADD or ADHD treatment plan. Answering these clinical questions will be useful for the providers in the practice setting to broaden treatment options for the numerous children and adolescents with ADD or ADHD.

Further Implementation and Dissemination

In the future, the psychiatry providers plans to continue stimulant holidays over a longer period of time and study the effects of regular stimulant holidays on grade point averages. This

will be done at the same practice site under the same supervision of the practice owner and colleague of the investigator, and with the investigator's collaborating psychiatrist.

The student investigator plans to disseminate this information via a regional psychiatric publication. Ideally, this information would be submitted to a journal that has a large range of provider specialties in order to reach primary care, school-based healthcare providers, and outpatient psychiatric-specific providers and prescribers, as these are environments in which CNS stimulants are most commonly prescribed and managed. The publication will be in the form of a commentary piece summarizing the findings of this current study to spark discussion between parents and providers about the appropriateness of a stimulant holiday in promoting quality healthcare.

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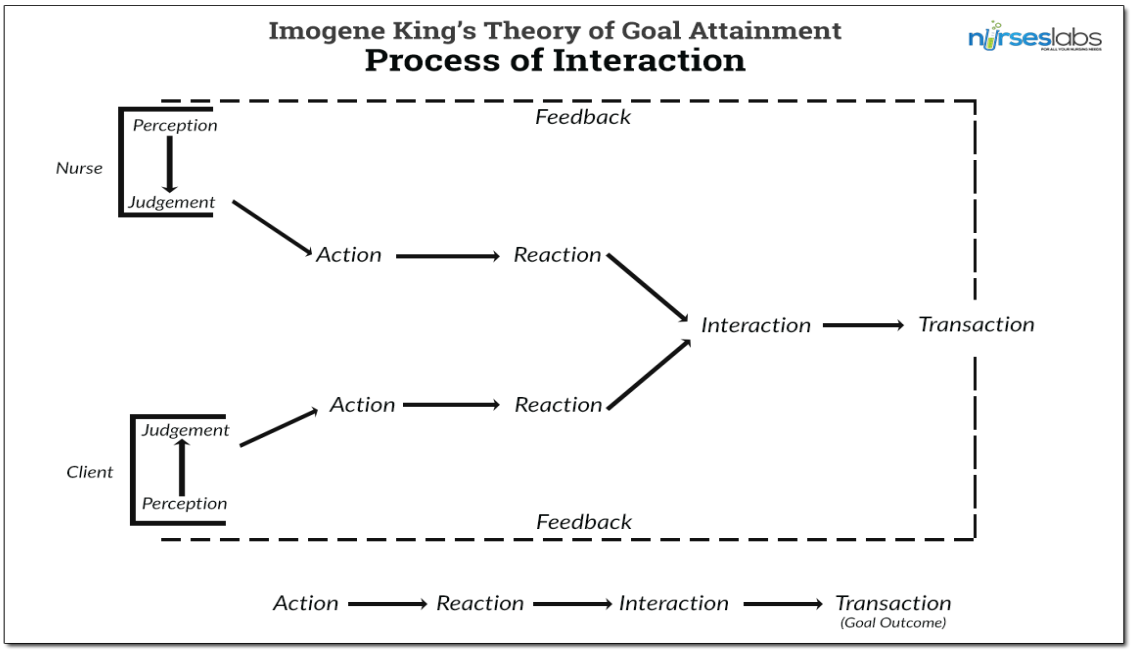
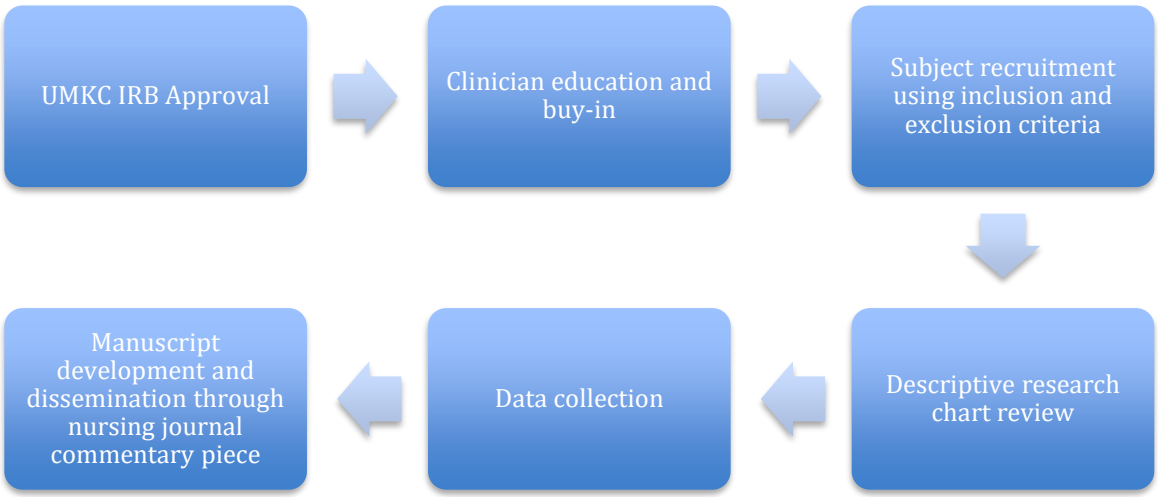
Appendix A: Theory to Application Diagram Imogene King's Theory of Goal Attainment: Process of Interaction (Wayne, 2014)

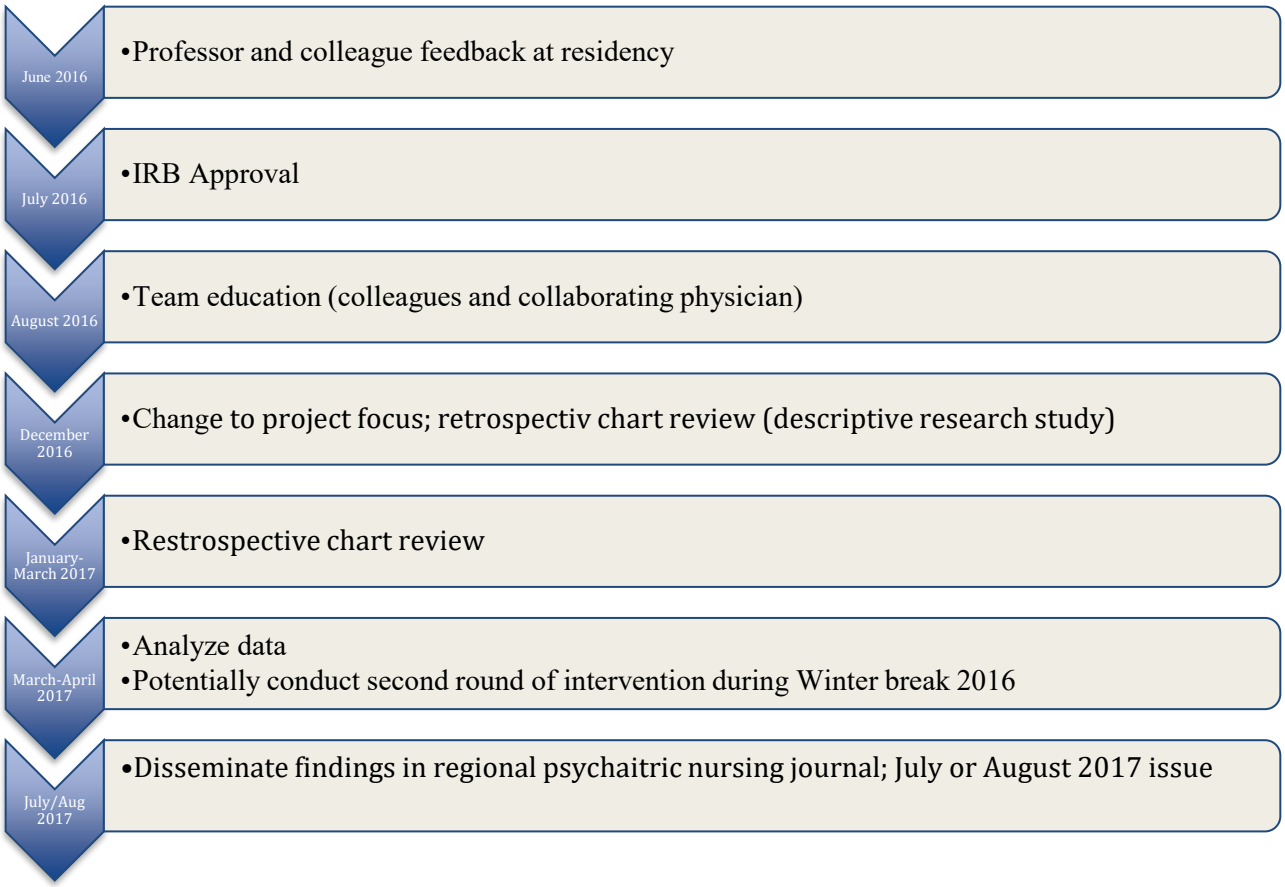
This diagram depicts how the process starts as both the nurse and client or patient having a perception. These perceptions will influence the working relationship and judgments of both parties. Then, an action occurs which is a sequence of behaviors of interacting persons which includes (1) recognition of presenting conditions; (2) operations or activities related to the condition or situation; and (3) motivation to exert some control over the events to achieve goals (Wayne, 2014). Additionally, you will see around the perimeter of this diagram that the process includes a feedback loop for ongoing evaluation, an important part of the nursing process and theory both.



Appendix B: Intervention Flow, Diagram and Procedure



Appendix C: Study Timeline Flow Graphic



Appendix D: Data Collection and Statistical Analysis Spreadsheet

N	Duration of the holiday in days	Med	Parent Initiated Holiday (Y/N)	Days Since Last Dose Change	Parent comments Regarding Usefulness	Provider Initiated Holiday (Y/N)	Completed as prescribed? (Y/N)	Age*	Gender * (M/F)	Holiday During School Break? (Y/N)	Has Been on Stimulant Medication for >12 Months? (Y/N)
1	7	XR	N	33	“Difficult”	Y	Y			Y	Y
2	7	XR	N	15	NA	Y	Y			Y	Y
3	7	IR	N	10	“Difficult”	Y	Y			Y	Y
4	7	XR	Y	66	“Difficult”	N	NA			Y	Y
5	5	XR	Y	78	NA	N	NA			Y	Y
6	7	IR	N	45	NA	Y	Y			Y	Y
7	7	IR	N	65	NA	Y	Y			Y	Y
8	10	XR	N	34	NA	Y	Y			Y	Y
9	14	XR	Y	45	“Difficult”	N	NA			Y	Y
10	3	IR	Y	23	NA	N	NA			N	Y
11	7	IR	Y	12	“Difficult”	N	NA			N	Y
12	2	XR/IR	Y	67	“Difficult”	N	NA			N	Y
13	5	XR	N	78	“Difficult”	Y	Y			Y	Y
14	2	IR	Y	84	NA	N	NA			Y	Y
15	5	XR	N	52	NA	Y	NA			Y	Y
16	10	IR	N	72	“Difficult”	Y	Y			Y	Y
17	7	XR/IR	N	59	NA	Y	Y			Y	Y
18	9	XR/IR	Y	75	NA	N	NA			Y	Y
19	8	XR	Y	42	NA	N	NA			Y	Y
20	4	IR	N	25	NA	Y	N			Y	Y
21	2	IR	N	64	“Difficult”	Y	N			N	Y
22	7	XR	N	17	“Difficult”	Y	Y			Y	Y
23	6	XR	Y	68	NA	N	NA			Y	Y
24	5	XR	Y	32	“Difficult”	N	NA			Y	Y
25	2	XR	Y	42	NA	N	NA			Y	Y

26	6	XR	N	51	NA	Y	Y			Y	Y
27	7	XR	N	18	“Difficult”	Y	Y			N	Y
28	7	XR	N	21	“Difficult”	Y	Y			Y	Y
29	7	XR	N	28	NA	Y	Y			Y	Y
30	7	XR	N	17	NA	Y	Y			Y	Y

*not reported to public, confidential.

Appendix E: UMKC IRB Approval Letter Approval

September 1, 2016

Members of UMKC Institutional Review Board
University of Missouri-Kansas City
Kansas City, MO 64108

UMKC IRB,

This letter serves to provide documentation regarding Kelsey Daugherty's Doctor of Nursing Practice (DNP) Project proposal. Ms. Daugherty obtained approval for her project proposal, Stimulant Holidays in Children and Adolescents with Attention Deficit-hyperactivity Disorder, from the School of Nursing DNP faculty committee on September 1, 2016.

If I can provide any further information, please feel free to contact me.

Sincerely,

Susan J. Kimble

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DNP Programs Director
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