

A Qualitative Analysis of Predictors of Success in the Behavioral Sleep in Preschoolers (SHIP) Intervention

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Abstract

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Given the importance of healthy sleep behaviors in early childhood, and a need for effective and accessible interventions, the current study utilized qualitative research methodology to identify early predictors of intervention success in a previously conducted study of a sleep health intervention for preschool-aged children with behavioral sleep problems, specifically the Sleep Health in Preschoolers (SHIP) intervention. We aimed to identify early markers that someone may need a more intensive or different intervention approach to be successful.

Regression analysis was used to determine SHIP clinical trial cases who had the highest and lowest response to the intervention. Thematic analysis was conducted on data consisting of text notes collected during the weekly delivery of the 12-week, active phase of the SHIP intervention between case managers and a primary study participant of a child with behavioral sleep problems. Content analysis was used to guide the identification of thematic predictors of intervention success.

Themes of high self-efficacy, positive parent attitudes, and engaged behavior with the intervention presented themselves more often in cases with a high response to the intervention relative to cases in the low response group. Themes of low self-efficacy, multiple concurrent known barriers to behavioral sleep health interventions, and disadvantageous parental behavior presented themselves more often in cases with a low response to the intervention relative to cases in the high response group.

The study is an example of how qualitative analysis can be a valuable tool in improving the real-world effectiveness of complex behavioral interventions and identifying signals we might use to better triage families with children with behavioral sleep problems toward appropriate interventions.



## Introduction

Interventions addressing early childhood behavioral sleep problems are critical for developmental health. Behavioral sleep problems affect 25-40% of children 2.5-5 years of age, and refer to difficulties such as bedtime resistance, night waking, and inadequate duration of sleep, and sleep onset difficulties, as opposed to physical sleep problems such as sleep-disordered breathing (Williams, 2017 & Archbold, 2002). Left untreated, childhood behavioral sleep problems result in both immediate and far reaching negative effects for the child, their family, and our communities. Short-term effects of early childhood behavioral sleep problems include persistent difficulties with emotional regulation and behavioral problems in children (Williams, 2020), and parental low quality sleep, psychological distress, and poorer general health relative to parents with children without behavioral sleep problems (Meltzer, 2014). Long term effects of early childhood behavioral sleep problems include the development of obesity, social-emotional difficulties, and attentional regulation developmental problems and poor academic achievement later in childhood, as they experience a need to adapt to increasing demands (Miller, 2015, Hysing, 2016, & Williams, 2020).

Evidence suggests that early childhood may be the optimal developmental time to prevent such widespread negative outcomes through the use of behavioral interventions (Maski & Kothare, 2013); however, qualitative evidence indicates that pediatricians lack the knowledge, training, education, and time to treat early behavioral sleep health issues (Boerner & Coulombe, 2015). Together, this evidence highlights both the necessity for effective and accessible interventions for early childhood behavioral sleep problems and to the urgency for a more prominent public health response to this issue.

While successful interventions are available to treat early childhood behavioral sleep problems (Meltzer, 2013), barriers to success persist (Jarvis, 2017). No single intervention is the right fit for everyone, and successful interventions need to be made publicly accessible and cost-effective. If we can identify early, those cases that may benefit more or less than average from an intervention, we might refer those for whom it may not work to a more appropriate intervention for their needs, recommend less intensive interventions to those who might

not need as much support, and better tailor the intervention to those for whom it is appropriate. Doing so would allow for more efficient allocation of and distribution of public health resources, while improving public health outcomes.

Given the importance of healthy sleep behaviors in early childhood, and a need for effective and accessible interventions, the current study utilizes qualitative research methodology to identify early predictors of intervention success in a previously conducted study of a sleep health intervention for preschool aged children with behavioral sleep problems, specifically the Sleep Health in Preschoolers (SHIP) intervention, described elsewhere.

## Methods

A qualitative analysis was conducted using data from the SHIP randomized clinical trial intervention to identify early predictors of intervention success for 2.5 to 5 year-old preschool-aged children with behavioral sleep problems. Thematic analysis was used to explore text written by SHIP study interventionists, henceforth called case managers, during the delivery of the intervention. A co-author performed a regression analysis to identify cases in which children had the highest and the lowest response to the SHIP study intervention, in order to qualitatively analyze predictors of intervention success. The primary researcher who conducted the analysis was blinded as to whether a case was in the high or low response group. After codes and themes were described and applied, case grouping was revealed to the analyst without identifying which group was the high or low response group. This was done to allow for between group comparisons to be made with regard to the frequency of codes and themes. Only after all analyses were completed were the identities of the group revealed.

### Qualitative approach and research paradigm

Growing evidence supports the use of qualitative analysis to improve the effectiveness of behavioral interventions (Lewin, 2009 and Nastasi, 2005). Qualitative analysis allows for the examination of why and how

behavioral interventions work, without being limited to those factors we might think to directly assess using surveys and other tools.

Although, qualitative researchers differ with regard to the boundaries of categorization of qualitative analysis approaches, they do seem to agree the methods of the analysis lend credence to validity and match the purpose of the study. This study aimed to explore a structured set of case note text from a pool of SHIP study participants who benefited the greatest and the least from the intervention in terms of child behavioral sleep problem outcomes in order to identify predictors of success. While both thematic and content analyses were used, this study identifies primarily with a thematic approach. A thematic analysis approach was used to look through time, within context, and finally at the meanings of the code and thematic patterns among all cases, and within cases groups prior to group intervention response identification, to identify thematic predictors of intervention success. Content analysis was used to guide the thematic analysis towards the elicitation of predictors of intervention response, by comparing case groups prior to group identification.

#### *Coding Schema*

Codes were not a priori established, rather, they were identified and applied through recognition of established risk factors for childhood behavioral sleep problems, established barriers and facilitators to intervention delivery, social cognitive theory principles regarding facilitators and barriers to behavior changes as promoted by the SHIP intervention, and any other frequently occurring themes in the case note text.

Further codes were applied based on the structure of the case notes and the nature of the timing of the intervention delivery. The data analyzed consists of text from case notes made by case managers who delivered the intervention to SHIP study parents whose child has behavioral sleep problems. The case notes from each intervention interaction were written using a standardized case note template (Figure 1).

<b>Intervention Case Note Template Instructions for Case Managers</b>	
<b>Subjective:</b>	“An illustrative quote or statement in the participant’s voice that represents participants perspective”
<b>Observation:</b>	“Case Manager observations about family (values, communication style, parental relationship, etc)”
<b>Last Week:</b>	“Action steps the participant took to reach last week’s goals; progress toward last week’s goals”
<b>Specific Goals:</b>	“Tailored (family specific), precise, or modified versions of standard goals”
<b>Barriers to Chosen Goals:</b>	“List current barriers”
<b>Planned Action Steps:</b>	“List identified action steps”
<b>Other:</b>	“Miscellaneous”

**Figure 1. SHIP Intervention Case Note Template with Subheading Instructions.**

The case note template served as a guide from which to evaluate the validity and meaning of codes applied within each subheading. This was done by coding each subheading’s excerpt, along with the codes contained within, as well as which week of the intervention the case note represented. These coding methods allowed for themes to appear when analyzing the codes within their given context and over time. Predictors of intervention success were identified by analyzing the themes that appear within each intervention success group.

The SHIP intervention itself was grounded in Social Cognitive Theory, which states personal factors such as one’s belief in their ability to create an action, termed self-efficacy, and one’s belief in what the outcome of that action will be, termed outcomes expectations, along with other personal attitudes and beliefs, work with one’s physical and social environmental to affect behavior. The SHIP intervention sought to improve child sleep by modifying parent negative beliefs, increasing outcome expectations and self-efficacy, and facilitating change in the social and physical environment. Similarly, this study utilized social cognitive theory to provide a framework by which self-efficacy talk, outcomes expectations talk, other personal attitudes or beliefs, and

possible social and environmental facilitators and barriers were coded and where applicable consolidated into themes.

### Researcher characteristics and reflexivity

A single researcher conducted the analysis. The research analyst was a single, white female of European origin, 34 years of age, and had no children. The research analysis had no relationship with participants, case managers, or study design or data collection. Analysis required viewing each case as a narrative in which the case manager, parent, and child are actors. Effort was made to maintain narratives reflective of only what is written in the text, rather than through the construction of case narratives from the analyst's own attitudes, beliefs, and experiences. The analyst utilized her personal Facebook account to follow parenting groups containing presumably English speaking parents from various parenting perspectives, to observe accounts of parenting perspectives on their children's sleep behaviors. The analyst also had three years of professional experience conducting structured and semi-structured interview for clinical trials. Again, effort was made to recognize and discard personal attitudes, beliefs, and behaviors from influencing the narratives elicited from the data.

Co-authors included the SHIP study PI (who supervised the case managers and oversaw study design and data collection, but had no relationship with participants) and an experienced qualitative researcher (with no relationship with participants, case managers, or study design or data collection) and served as advisors to the primary researcher.

### Human subjects

Researchers obtained approval for use of secondary data from the SHIP randomized controlled trial from the Seattle Children's Research Institute's Institutional Review Board. Data was transferred from the SHIP study DatStat Research Management System into a Microsoft Word document stored on a secure Seattle Children's server following all HHS and IRB data security protocols. Data was de-identified utilizing the Safe Harbor Method

(HHS.gov) on site at Seattle Children's Research Institute in Seattle, Washington. De-identified data was stored and analyzed on a University of Washington secure cloud and on the Dedoose® secure site.

## Population

An unblinded researcher (MG) selected the current study participant pool from the previously conducted SHIP clinical trial intervention study population. The SHIP clinical trial recruited participants from pediatric clinics in King County, Washington, via community outreach and screening, attempting to create a sample representative of the King County population in terms of race, ethnicity, parent education, and income. The following SHIP clinical trial inclusion and exclusion criteria further defined the current study population. Children who screened positive for behavioral sleep problems as indicated by a score of  $\geq 50$  on the CSHQ or who receive a score of  $\geq 41$  but receive less than 9 hours of sleep per parent report were eligible for participation. Children who screened positive for on the CSHQ for sleep-disordered breathing were excluded as treatment for such conditions was beyond the scope of the SHIP intervention. Additional exclusion criteria included 1) significant developmental disabilities (including PDD/Autism), 2) cancer, diabetes, or other serious comorbid conditions which affect child sleep, 3) treatment with stimulant medication for use with ADHD or other conditions, 4) children with parents who are unable to speak and read English. For each family recruited, one parent was identified as the primary study parent and one child the primary study child and assigned a case study identification number. Cases were randomized into either the behavioral sleep intervention or an active control group.

The following method was used by an unblinded researcher to select the current study population from the previously conducted SHIP study intervention group. First, a stepwise regression model was fit on control group participants using baseline sleep, child, and family characteristics to predict 12-month follow-up outcomes on the Child Sleep Wake Scale (CSWS), and then applied the same regression equation to the intervention group to calculate their predicted CSWS outcome at 12 months in the absence of intervention ( $\hat{\rho}$ ). From this, we calculated the delta between their actual outcome and the predicted ( $\Delta = \hat{\rho} - \text{CSWS}$ ), and used

this delta to identify those participants with the greatest difference (N=20) and those with the least difference or a negative difference (N=20) created the study population. From this sample of 40, a quasi-random sample of 30 was included in this study analysis.

### Data collection

We conducted a qualitative analysis using data from the previously conducted SHIP randomized clinical trial intervention to identify early predictors of intervention success for 2.5 to 5 year-old preschool-aged children with behavioral sleep problems. Current study data consisted of text notes, henceforth referred to as case notes, collected by case managers during each weekly delivery of the 12-week, active phase of the SHIP intervention. The active phase of the SHIP intervention included an initial home visit between the case manager (~2 hours in length) and the study participants' designated parent and weekly telephone follow-up calls (~10 minutes each). The home visit included a review of the baseline assessment report, psychoeducation, goal setting, problem solving, and an introduction to the SHIP intervention materials and tools. Follow-up phone calls focused on reviewing progress, barriers, and facilitatory experienced since the last session, revising or adding goals as indicated, problem-solving, and support. This active phase was followed by a maintenance phase of the intervention with monthly follow-up calls for 9 months, but the current analysis focuses solely on the initial 12-week active phase. During SHIP intervention delivery interactions, case managers recorded notes following a case report template (Figure 1). Case notes were used during the intervention to track fidelity to the intervention and to track participant progress, by ensuring reflection on the participants' experience, the case managers observations, progress made from the prior week, the reevaluation of goals, identification of barriers, and assistance with problem solving around barriers toward establishing an agreed upon plan for the upcoming week. All case notes were entered into the study RMS database by the case managers after each intervention delivery interaction. After receiving the 30 case studies selected from the regression analysis, the research analyst de-identified the text data as described earlier, before entering data into the Dedoose online platform for analysis.

## Units of study

The unit of study was a single case, reflecting the delivery of the SHIP intervention to the primary study parent of the eligible child with behavioral sleep problems; families were asked at enrollment to select one parent or guardian to be the primary study parent for all intervention and assessment contacts, ideally the adult who most often was responsible for the child's bedtime. In > 95% of enrolled families, this primary study parent was the child's mother.

## **Data Analysis**

This study aimed to identify early markers that someone may need a more intensive or different intervention approach to be successful. Although the population was defined by participants' intervention success 12 months after the intervention, only the 12-week active phase of the intervention, was analyzed in order to identify early predictors of intervention success. A thematic analysis approach was used to analyze 30 cases as identified from the sampling strategy used to elicit a list of high intervention responders and low intervention responders. Thirty de-identified sets of twelve case notes each were uploaded into Dedoose to create 30 media files. The thirty cases were read and re-read by the primary researcher using the iterative approach. An initial list of codes was created. Twenty cases were coded using an iterative approach in which codes were consolidated, expanded, deleted, and added resulting in a final list of codes.

Thirty participants were coded through week 12 with the final list of codes. Where relevant, themes were developed using a social cognitive theory model. Themes were developed based on the model for social cognitive theory (Bandura, 2004) and by expanding codes such as routine changes, nap problems, and multiple caregiver issues into themes and coding for more manifest codes within those themes. Excerpts consisting of each of the twelve weekly case notes from each intervention interaction were coded as week\_0 through week\_12 respectively. Each subjective, objective, last week, goals, barriers, and planned action step excerpt was coded respectively, according to the case note template.

Case grouping was revealed to the analyst without identifying which group was the high or low response group. Two sets of descriptors were created in Dedoose, a case ID and dummy group identifiers in place of high and low response group descriptors. Using the Dedoose Data Selector tool, a saved data set was created for each outcome group. The mixed methods analysis tool for descriptor by code was used to determine a count difference between each unidentified group and the themes and codes applied in Dedoose. A code application by case ID analysis was run within each case group and compared to the number of codes applications per group to be sure no one participant was contributing disproportionately to the total number of code applications per group and that general comparisons matched what I saw during my read through. Due to the difference in population sizes, normalize counts were used to compare the number of applied codes to each group.

Each case within the unidentified groups was read and brief notes were made as to each cases progress towards intervention goals. These notes were compared to the prominent theme and code differences from the content analysis. Structural codes, including intervention week and the case note subheading codes were used to gain a greater depth of understanding to the meaning of the patterns of codes and themes as through time and as they existed within the case note template context.

Some codes were excluded from analysis because they were determined to have been not applied consistently or had multiple meanings in the codebook. Other codes and themes were excluded from the analysis because they did not present in the text data explicitly more than once or twice. For example, the theme for outcome expectations did not appear manifestly enough to be considered valid.

## Results

A total of 30 cases were analyzed using 106 separate codes nested within 18 themes; in comparing between cases with low vs high response to intervention, 39 thematic codes, 19 structural codes for intervention week and case note subheading, for a total of 58 codes and 9 themes appeared useful in differentiating between the groups (Table 1).

Low Response Group	Both Groups	High Response Group
<p><b>Low or Decreased Self Efficacy</b>  <i>Parent finds it hard for them to change other caregivers</i>  <i>Parent finds it hard to set limits</i>  <i>Parent finds it hard to respond to child</i>  <i>Parent thinks goals are not doable</i></p> <p><b>Parent Attitudes</b>  <i>Parent preoccupied</i>  <i>Parent does not want change when things are going well</i></p> <p><b>Parent Behavior</b>  <i>Parent reports not enforcing rules or routine</i>  <i>Parent makes no change since last call</i></p> <p><b>Routine Changes</b>  <i>Change in caretaker at bedtime</i>  <i>Late Nights</i></p> <p><b>Nap Problems</b>  <i>Competing schedule demands</i>  <i>Daycare controls naps</i>  <i>Late or unplanned naps</i>            Child sick            Parents sick, tired, or stressed            Case manager &amp; parent not in agreement            Multiple caregivers struggle with consistency</p> <p><b>Outcomes</b>  <i>Parent recognizes their behavior affects child behavior and attitudes</i>  <i>Parent is less stressed</i></p>	<p><b>Low or Decreased Self Efficacy</b>  <i>Parent finds it hard for them to be consistent</i></p> <p><b>Parent Attitudes</b>            Parent child want to spend time together</p> <p><b>Routine Changes</b>  <i>Holidays</i>  <i>Vacations</i>  <i>Weekend Routine Changes</i></p> <p><b>Siblings</b>  <i>Competing sibling needs</i>  <i>Siblings distracting or disrupting sleep</i>            Child resists change or parent control            Parent job demands</p> <p><b>Outcomes</b>            Parent feels frustrated or challenged</p>	<p><b>High or Increased Self Efficacy</b>  <i>Parent finds it going better/easier than they expected</i>  <i>Parent willing/ready to tackle new goals</i>  <i>Parent thinks goals are doable</i></p> <p><b>Parent Attitudes</b>  <i>Parent positive despite setback</i>  <i>Consistency is helpful</i></p> <p><b>Parent Behavior</b>  <i>Parent exhibits self-problem solving</i>  <i>Parent exhibits self-monitoring</i></p> <p><b>Outcomes</b>  <i>Parent proud</i>            Child likes new routine or tool</p>

**Table 1. Prominent Themes and Codes by High, Low and Both Intervention Response Groups.** Bolded text represents themes, italicized text represents codes within a theme, and standard text represent codes.

Each case, or set of case notes, contained between 53 and 130 code applications. Code applications followed a positive trend with case word length. The low intervention response group consisted of 16 cases and contained between 58 to 130 code applications per case. The high response group consisted of 14 participants and contained between 53 and 118 code applications per case.

## Themes Predictive of High Intervention Response

Themes of high self-efficacy, positive parent attitudes, and engaged behavior with the intervention presented more often in cases with a high response to the intervention relative to cases in the low response group. The high intervention response group was coded more often for indicators of high self-efficacy, including perceiving goals as doable and being ready and willing to set new goals. High responders were more likely than the low response group to code for “finding it hard for them to be consistent” in the more subjective subheadings of the case notes, specifically, in the “subjective” and parent reported “barriers to goals” sections, both of which demonstrate an awareness of the issue, whereas the low responders were more likely to code for difficulty with consistency in the more objective subheadings of case manager “observation” and through the study analyst coding inconsistent behavior described in the “last week” subheading. The presence of codes acknowledging issues with self-efficacy for consistency within subjective case note subheadings, suggests that high responders had awareness of their lack of self-efficacy in this area. It could also mean that parents were already able to perform the skills required by the intervention having tried behavioral sleep interventions, but they had difficulty maintaining consistency without accountability from the case managers. High responders are more likely to value consistency than low responders. Finally, analysis indicated that high responders are proud more often than low responders and maintained an attitude that is positive despite setbacks more often than low responders. High responders also exhibited self-problem-solving and self-monitoring more often than low responders.

## Themes Predictive of Low Intervention Response

Themes of low self-efficacy, multiple concurrent known barriers to behavioral sleep health interventions, and disadvantageous parental behavior with regard to achieving intervention goals presented themselves more often in cases with a low response to the intervention relative to cases with a high response. Cases with a low intervention response were coded more often for low or decreased self-efficacy than high responders, in that they found it difficult to set limits, respond to child behavior, and believed goals were not

possible to achieve. All of these factors are established predictors of low likelihood of enacting behavior changes needed to succeed in the SHIP intervention (Jarvis, 2017).

The low response group was coded more often than high responders for parents and other child caregivers having problems between one another with consistency regarding the intervention delivery to their children. No low response cases were coded for valuing consistency and, in fact, the analysis suggests low responders were more likely to self-impose barriers upon themselves whether they realize it or not. For example, late nights were coded more often as a barrier in the pink group than in the purple group. While holidays, seasons, vacations, company in the evenings, and weekend routine changes occurred equally in both groups, late nights consisting of sleepovers, attending a late baseball game, or a trip to the zoo were coded more often in the low response group.

Many barriers, including low self-efficacy as initially described, did not appear to be self-imposed. For example, child sick was coded more often in the low responders than in high responders. Child sick was recorded as a subjective statement made by parent regarding the previous week. Parents report being stressed, tired, or sick more often in low responders than in high responders. It may be that the low responders truly struggled more in these ways, and that the intervention was less effective for them because of these barriers, or it may be that these parent stressors had a bigger impact on the ability to adhere to the intervention strategies in the low responders and that the high responders had greater resource capacity that allowed them to stay closer to on track despite parent stressors. Parent being sick, tired, or stressed was an observation by the case manager made early and consistently in the intervention. While low responders intermittently do not code for being sick, tired, or stressed, these occurrences of health were short lived. Low responders did not go long periods of time without coding for ill health like high responders.

Nap problems were coded more often in the low response group compared to the high response group and were mentioned as explicit barriers to the previous week's goals throughout the first half of the intervention. Nap problems are discussed in the literature similarly to nighttime behavioral sleep problems, with

a need to maintain consistency with the timing and duration and routine surrounding naptime. While the SHIP intervention does include a goal for nap problems, low responders often faced not only the prospect of establishing a bedtime schedule and routine, but also a naptime and routine. Nap problems included nap problems due to competing schedule demands and nap problems due to the child taking late or unplanned naps, such as during a car ride home, while the parent is cooking dinner, or while at another caregivers house. Finally, nap problems were coded when the child's school or daycare controlled nap time and nap length, and this schedule was such that it did not work for the parent. In cases in which daycare controls naps were coded, the parent was asked to talk to the daycare. It is not clear from the case notes how many cases did talk to the daycare, as the analyst does not recall reading about any nap problems due to daycare controlling nap resolutions; however, participants did struggle with contacting the daycare at all. As low responders were coded more often than high responders for low self-efficacy to change caregiver sleep behaviors and attitudes to be in line with study goals, it may be the case that the same lack of self-efficacy exists to change a daycare's behaviors and attitudes to be in line with study goals.

Low responders were more likely to exhibit parental behavior such as not enforcing rules or routine and not making any changes since the last call. Interestingly low responders did not identify barriers to the goals set during the intervention as often as the high responders.

A code for "parent recognizes their behavior affects child" was coded more often in low responders than high responders. This code was used when parents made statement such as "its more about the parents making changes than the kids huh?", "Mother recognized that her reactions help to rile kid up", and "I realized if we don't have a routine how can she have a routine" which to the analyst reflected a realization about the parent's role as a model for their child's behavior. It may have been likely that high response cases already recognized the effect their responses, behaviors, and attitudes on their children, given their presumed skill set at achieving consistent behavior changes for their child's sleep. This realization among low responders occurred about

halfway through the intervention for about a quarter of the low response participants and may be facilitatory in towards enacting behavior change affecting child health outcomes.

### Exploratory Themes Observed after Unblinding

A common theme identified in both intervention response groups was the presence or lack of presence regarding the establishment of consistent routines early in the SHIP intervention, and the maintenance of these routines when confronted with barriers. Nearly all high responders established a consistent routine immediately within the first, if not first few, weeks. Low responders were more likely to struggle with achieving or maintaining consistent behavior change. High responders are more likely to maintain consistency and routines in spite of barriers that were revealed to be present in both the low and high response groups. For example, high responders are more likely to maintain a bedtime schedule and a bedtime routine while on vacation, without assistance from their case managers, whereas low responders have more difficulty establishing, nonetheless maintaining, their gains while in a new environment.

High responders may have been able to maintain consistency because it had already been established, and/or their value of consistency, coded as such, might have driven their response. Furthermore, high responders, have high self-efficacy, known to be associated with positive attitudes, and high responders are more likely to express a positive attitude despite setbacks than the low response group. For example one high responder who achieved a consistent routine by week one, had a car accident and a week of her and her child being ill, and a vacation the following week, and was still able to successfully keep a positive attitude and reestablish her routine, stating, “going well – there were some issues but it’s going great” at week four.

The analyst believes a theme exists in the data though it was not coded, that is relevant to way in which the parent is positioned relative the child. This difference in positioning maybe related to the parents’ loci of control as either externalized in the low responder group and internalized in the high responder group, possibly reflective of the fact that low responders had more difficulty with limit setting. This difference may be detectable in the data by the way the case study parent talked to the case manager.

## Discussion

These results support the model of social cognitive theory upon which the intervention itself was based, and support evidence cited by the literature on parent self-reported barriers to childhood behavioral sleep problem interventions. It is important to reiterate that the purpose of this study was not to make claims regarding the association between the predictors presented in this paper, although data exists to support such a theory, but to present them as possible indicators of success or struggles to further tailor SHIP intervention delivery strategies. The study is not generalizable to all cases in behavioral sleep interventions nor to high or low responders in other behavioral sleep interventions. These results should be used in future research to improve upon the validity of these themes as indicators of success in interventions, to improve early childhood behavioral sleep interventions, specifically the SHIP clinical trial intervention, and to better help families who struggle with these issues, as they affect the health of our communities.

Results support self-efficacy as a predictor of intervention success in that high responders with high self-efficacy are able to make fast and consistent changes toward the improvement of their child's behavioral sleep problems and as indicted by the intervention. A defining feature of self-efficacy is the ability to change a given behavior even in the face of barriers (Bandura, 2004). Consistent with this model, high responders face some of the same barriers as the low response group; however, they are able to achieve and maintain consistent gains to their child's behavioral sleep patterns. Thus, even when struggles arise, high responders are able to stay consistent and stick to the routine put in place by the intervention or they are able to rebound back quickly. Parents with children with behavioral sleep problems who have low self-efficacy might better more from interventions such as those that have been shown to increase parental self-efficacy (Wittkowski, 2017).

Nap problems may have presented more often in low responders because the intervention focuses more intensely on nighttime sleep and may be somewhat less effective in children who have nap problems that are major contributors to their overall sleep deficits. Alternatively, it may be that struggling with both nap and

nighttime sleep may be a signal for a more complex system of barriers impeding sleep than might typically be seen in families for whom bedtime is the major issue.

Parents in the low response group were more likely to have a child that is sick and to be sick, stressed, or tired themselves. This may have simply been the case, or it might reflect the unresolved behavioral sleep problems their child faced. Child and parent health covary with one another, and parents with children who are sick are more likely to struggle with the consistency and limit setting (Meltzer 2011), creating a reinforcing negative cycle in which parents are unable to respond to their child's behavioral sleep problems because they themselves are sick in turn causing more problems for the child. It is also possible that the low success group could have more significant physical, emotional, behavioral, or cognitive health problems than elicited by the case note text.

### Limitations

This study is not without its limitations. This study did not have a second coder and therefore no inter-coder reliability was established. This is a significant limitation. There was a lack of codes and themes elicited for goals and outcomes in keeping with social cognitive theory, and specific to the SHIP intervention itself. Furthermore, the study did not account differences in how the case notes were written by the case managers, as case managers had variable ways of describing parent interactions and variable ways of making meaning of the case note template instructions. As the outcome used here to determine low vs. high responder was a parent report survey scale (CSWS) measure, it is also possible that social desirability bias may have driven some of the differences between groups observed here – e.g., those parents most vulnerable to social desirability bias may have both overinflated their progress on the surveys and minimized the struggles and barriers they encountered during the phone calls. The fact that the CSWS is highly correlated with more objective measures of sleep (including prospective sleep diary and actigraphy) makes this somewhat less likely, but it is still a factor to consider.

## Implications and Future Directions

Qualitative research is a useful tool toward the improvement of interventions. The possibility that social desirability may have been at play in the parent reported surveys, means that qualitative analysis is useful in the identification of the characteristics the survives purport to measure. Researchers should monitor for these characteristics early in an intervention as they may have not been picked up by surveys. Future directions into areas done after revealing groups but not their identity, and into codes that that were not addressed to alleviate these limitations. Future studies should also investigate parental beliefs regarding behavioral sleep interventions when a child sick, and how to address day-time nap problems along with nighttime behavioral sleep problems.

## Conclusion

The study is an example of how qualitative analysis can be valuable tool in improving the real-world effectiveness of complex behavioral interventions and identifying signals we might use to better triage families with children with behavioral sleep problems toward appropriate interventions. Martin Hagger and Mike Weed debate the efficacy of behavioral interventions, respectively suggesting either greater in depth investigation into the implementation of behavioral interventions or a paradigm shift away from aggregate population changes and toward the disruption of social norms through a greater in depth understanding of the socio economic and environmental factors that lead persons toward acceptance of behaviors (Hagger & Weed, 2019). Qualitative research in supplement with behavioral interventions is uniquely situated to achieve both such goals, driving science towards the possibility of uniting areas of debate.

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## References

1. Archbold, K., Pituch, K., Panahi, P., Chervin, R.D. (2002). Symptoms of sleep disturbances among children at two general pediatric clinics. *J Pediatr*, *140*(1), 97-102.
2. Bandura, Albert. (2004). Health Promotion by Social Cognitive Means. *Health Education & Behavior*, *31*(2), 143 – 164. DOI: 10.1177/1090198104263660.
3. Boerner, K.E., Aimée Coulombe J., & Corkum, P. (2015). Barriers and facilitators of evidence-based practice in pediatric behavioral sleep care: qualitative analysis of the perspectives of health professionals, *Behavioral Sleep Medicine*, *13*(1), 36-51. DOI: 10.1080/15402002.2013.838766.
4. DiClemente, R.J., Salazar, L.F., & Crosby, R.A. (2013). *Health Behavior Theory for Public Health. Principles, Foundations, and Applications*. Jones & Bartlett Learning.
5. O'Brien, B.C., Harris, I.B., Beckman, T.J., Reed, D.A., & Cook, D.A. (2014). Standards for Reporting Qualitative Research: A Synthesis of Recommendations. *Academic Medicine*, *89*(9): 1245-1251.  
Doi:10.1097/ACM.000000000000038.
6. Hagger, M.S. & Mike Weed. (2019). Debate: Do interventions based on behavioral theory work in the real world. *International Journal of Behavioral Nutrition and Physical Activity*, *16*, 36.
7. Gregory, A.M., Cox, J., Crawford, M.R., Holland, J., Haravey, A.G., & The STEPS Team. (2009) Dysfunctional beliefs and attitudes about sleep in children. *Journal of Sleep Research*, *18*, 422-426. DOI:10.1111/j.1365-2869.2009.00747.x
8. Guest, G., MacQueen, K.M., & Namey, E.E. (2014). *Applied Thematic Analysis*. SAGE Publications, Inc.
9. Hysing, M., Sivertsen, B., Garthus-Niegel, S., & Eberhard-Gran, M. (2016). Pediatric sleep problems and social-emotional problems. A population-based study. *Infant Behavior & Development*, *42*, 111-118.  
<http://dx.doi.org/10.1016/j.infbeh.2015.12.005>.

10. Jarvis, J.W., Harrington, D.W., & Manson H. (2017). Exploring parent-reported barriers to supporting their child's health behaviors: a cross-sectional study. *International Journal of Behavioral Nutrition and Physical Activity*, 14, 77.
11. Lewin, S., Glenton, C., & Oxman, A.D. (2009). Use of qualitative methods alongside randomized controlled trials of complex healthcare interventions: methodological study. *BMJ*, 339,b3496.
12. Maski, K.P., & Kothare, S.V. (2013). Sleep deprivation and neurobehavioral functioning in children. *International Journal of Psychophysiology*, 89, 259-264: DOI:10.1016/ijpsycho.2013.06.019.
13. Meltzer, L.J. & Mindell, J.A. (2013). Systematic review and meta-analysis of behavioral interventions for pediatric insomnia. *Journal of Pediatric Psychology*, 39(8), 932-948. Doi:10.1093/jpepsy/jsu041.
14. Meltzer, L.J. & Montgomery-Downs, H.E. (2020). Sleep in the family. *Pediatr Clin N Am*, 58, 765-774. Doi:10/1016/j.pcl.2011.03.010.
15. Miller, A.L., Lumeng, J.C., & LeBourgeois, M.K. (2015). Sleep patterns and obesity in children. *Curr Opin Endocrinol Diabetes Obes*, 22(1), 41-47. Doi:10.1097/MED.
16. Nagelhout, G.E., Hogeling, L., Spruijt, R., Postma, N., & de Vries, H. (2017). Barriers and facilitators for health behavior change among adults from multi-problem households: A qualitative study. *International Journal of Environmental Research and Public Health*, 14(10), 1229.
17. Nastasi, B.K. & Schensul, S.L. (2005) Contributions of qualitative research to the validity of intervention research. *Journal of School Psychology*, 43, 177-195.
18. Neuendorf, K.A. (2002). *The Content Analysis Guidebook*. Sage Publications, Inc.
19. Paterson, J.L., Reynolds, A.C., Duncan, M., Vandelanotte, C., & Ferguson, S.A. (2019). Barriers and enablers to modifying sleep behavior in adolescents and young adults: a qualitative investigation. *Behavioral Sleep Medicine*, 17(1), 1-11.
20. Salmons, M., Lieber, E., & Kaczynski D. (2020). *Qualitative and Mixed Methods Data Analysis Using Dedoose®: A Practical Approach for Research Across the Social Sciences*. Sage Publications, Inc.

21. U.S. Department of Health & Human Services. Guidance Regarding Methods for De-identification of Protected Health Information in Accordance with the Health Insurance Portability and Accountability Act (HIPAA) Privacy Rule. Retrieved from <https://www.hhs.gov/hipaa/for-professionals/privacy/special-topics/de-identification/index.html>.
22. Vaismoradi, M., Turunen, H., & Bondas, T. (2013). Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. *Nursing and Health Sciences*, *15*, 398 – 405.
23. Williams, K.E., Berthelsen, D., & Walker, S. (2017). A developmental cascade model of behavioral sleep problems and emotional and attentional self-regulation across early childhood. *Behavioral Sleep Medicine*, *15*, 1-21. DOI: 10.1080/15402002.2015.1065410.
24. Williams, K.E. & Howard, S.J. (2020). Proximal and distal predictors of self-regulatory change in children aged 4 to 7 years. *BMC Pediatrics*, *20*:226. <https://doi.org/10.1186/s12887-020-02133-6>.
25. Wittkowki, A., Garrett, C., Calam, R., & Weisberg, D. (2017). Self-report measures of parental-self efficacy: A systematic review of the current literature. *J Child Fam Stud*, *26*, 2960-2978. DOI: 10.1007/s10826-017-0830-5.