THE EFFECTS OF PARENTAL ANXIETY AND MEDICATION ATTITUDES ON THE USE OF PAIN MEDICATION IN PEDIATRIC CANCER PATIENTS

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Parents of pediatric cancer patients experience uncertainty with regards to cancer-related pain. Parental pain management at home is very important in managing the overall symptoms of pediatric cancer patients. It is very important to investigate the relationship between parental anxiety and pain medication use. Studies have suggested that more anxious parents tend to experience more symptoms of acute stress compared to less anxious parents. Studies in post-operative children have also found that parental attitudes can be a barrier in pain management. In this study, I hypothesized that parents having more favorable attitudes to medication will administer more analgesics to their children. I also hypothesized that increased levels of anxiety in parents will lead to a greater use of analgesic medication in the management of pediatric cancer pain. The study found that parents who have less misconceptions about medication *Avoidance* (p = 0.09) and *Appropriate use* (p = 0.03) administered more medication to their children. Parental attitudes regarding *Fear of Side Effects* did not significantly impact the administration of medication. In terms of anxiety, only child-trait anxiety showed a significant relationship with the administration of medication (p = 0.04). The implications of this study may include parental counseling and intervention by the healthcare providers on medication administration. The healthcare providers must address questions regarding how much medication, how often, and what signs to look for. This way, pediatric cancer patients are adequately and appropriately treated for pain at home.

Cancer conjures fear and anxiety in the afflicted individual, as well as the people close to them. The parents of pediatric cancer patients experience extreme distress when dealing with the diagnosis, treatment, and post-treatment conditions of their children. Anxiety plays a big role in the experience of the parents as it brings forth a feeling of uncertainty and threat (Jantien Vrijmoet-Wiersma et al, 2008). There is a marked difference in levels of anxiety between parents

whose child was recently diagnosed with cancer, parents of children undergoing treatment, and parents of children who are off-treatment (Brown et al, 1992). The general stigma associated with cancer, coupled with the parent's lack of information can contribute to the shock brought about by the initial diagnosis. Even after the diagnosis, parents go through intense distress when their child is undergoing cancer treatment This might be due to watching their children suffer through painful procedures and having difficulty in dealing with interruptions in their normal daily lives (Best, 2001).

Parental distress may be partly due to the pain symptoms that are commonly experienced by pediatric cancer patients. Although pain is only one of the many symptoms cancer patients experience, it is one of the most distressing symptom that patients and caregivers fear (Collins, 2002). Pain in cancer patients is enhanced due to the increased sensitivity of nociceptors after exposure to products of tumor cells or tissue injury (Collins et al, 2006). Although pharmacological and non-pharmacological therapies are available to manage pain in cancer patients, its multidimensional nature makes cancer pain complicated to control. Drug therapy is the main tool used in managing pediatric cancer pain (Jacox et al, 1994). The World Health Organization analgesic ladder, divided according to the drug's usefulness in dealing with mild, moderate, and severe pain, is used in determining the type of analgesic medication administered in pediatric cancer patients (WHO, 1998). On the other hand, non-pharmacological treatments may include physical and behavioral interventions such as massage, acupuncture, deep breathing, and meditation.

Due to the increase in outpatient treatment of pediatric cancer patients, parents are largely responsible for pain management in the home setting; yet, parents may not have enough information and expertise to manage their children's pain. Furthermore, the parent's emotional

behavior and state may influence how parents manage children's pain symptoms. Past studies have indicated that parents showing a greater level of anxiety tend to experience increased symptoms of acute stress compared to less anxious patients (Patiño et al, 2008)**.** This added acute stress may cause parents to overcompensate with their child's pain management and unintentionally give too much pain medication in order to alleviate their children's symptoms. This is very important as changes in the healthcare system focus on outpatient treatment of children, thus putting more care responsibilities in the hands of the parents.

Overuse of pain medications can result in unwanted side effects such as nausea, vomiting, constipation, and diarrhea. More importantly, these medications, when used indiscriminately, may cause liver and renal toxicities. Acetaminophen, a drug commonly used to manage pediatric cancer pain, can cause injury to liver cells that can gradually progress into acute liver failure (Lee, 2003). Due to its importance and potential risks, medication use in pediatric cancer patients at home should be examined more closely. The primary hypothesis of this study is that increased levels of parental anxiety will lead to a greater use of pain medications to control the child's pain symptoms at home. In addition, although untested in the pediatric cancer population, past studies involving postoperative children show that parent's attitudes may be a barrier to the child's postoperative pain assessment and pain management (Zisk-Rony et al, 2010). This may be applicable to parental pain assessment and management of pediatric cancer pain at home. In connection to this, the study hypothesized that parents having more favorable attitudes towards the use of pain medications will use analgesics to a greater extent than those who have less favorable attitudes.

MATERIALS AND METHODS

All experiments were carried out in accordance with the Institutional Review Board and the University of California, Irvine, and were consistent with Federal guidelines.

Study Participants

Children ages 4-17 and their parents were recruited to participate in this study, which was part of a larger cross-sectional study examining prevalence of pain and analgesic administration in children undergoing outpatient treatment for cancer. Recruited children were currently undergoing cancer treatment and were routinely seen in the outpatient infusion center at the Children's Hospital of Orange County (CHOC). Exclusion criteria included: a) Children with development delays or special needs, and b) children whose parents did not speak English. Background information about the study was provided to prospective participants by mail. Trained research assistants met the prospective participants at CHOC's outpatient infusion center to answer questions and consent their participation.

Study Procedures

Participants were provided the questionnaires and were given instructions on completing them. Parents were required to log whether or not they administered medication to their child on a daily basis for 14 days. Additionally, parents were asked to log the specific times during the day when the medication was administered, as well as the type and amount of medication. Parents who did not administer medication on a specific day were asked to indicate the reason for not giving any medication to their child. Parents and children also provided daily reports of child pain severity for the 14 days.

Measures

Demographic Information. Parents completed a demographic form that included information about their child's gender, race, age, diagnosis, and ethnicity. Additionally, the parents' gender, race, age, and education levels were also collected.

Medication Attitude Questionnaire (MAQ). The MAQ (Zisk et al, 2007; Forward et al, 1996) was developed to examine attitudes about the use of pain medication in treating children's pain. The instrument consists of 27 items each rated on a seven-point Likert-type scale that ranges from strongly disagree to strongly agree. Parents are instructed to consider analgesia as any medication prescribed for a specific event or over-the-counter analgesia any time. Internal consistency (Cronbach's Alpha) for the overall scale is reported between 0.68 and 0.73 (Forward et al, 1996). Three factors exist within the measure, including; *Appropriate-use* (relates to the proper use of drugs in children), *Fear of Side-effects* (relates to the worries brought about by possible drug-side effects), and *Avoidance* (relates to the avoidance of medication until absolutely necessary).

State-Trait Anxiety Inventory (STAI). The STAI is a widely used self-report anxiety assessment instrument for adults (Spielberger, 1983). The questionnaire contains two separate, 20-item, 4-point self-report rating scales for measuring trait and state anxiety. Higher overall scores denote higher levels of anxiety. Test-retest correlations for the STAI trait are high and range from 0.73 to 0.86 (Spielberger, 1983). Parents completed the STAI at baseline.

Faces Pain Scale-Revised (FPS-R). This self-report pain scale consists of a series of six faces ranging from a neutral expression ("no pain") to an expression representing the "most pain possible" (Hicks et al, 2001). The well-validated scale has been recommended for use in children ages 4-18 (Stinson et al, 2006). The FPS-R has demonstrated good convergent validity with visual analog scale and observational scale ratings of pain (Hicks et al, 2001).

Pain Medication Record. This is a form completed by parents on their analgesic medication administration to children in the home setting for 14 consecutive days. Parents reported what pain medication was used, time of administration, and dosage for each dose of medication given for the entire 14 days. If no medication was given, parents were asked to indicate the reason from the following response options: no medication was prescribed, child was not in pain, child refused medication, and other.

Analysis

IBM SPSS version 20 was used to analyze descriptive statistics for the whole sample and conduct tests of group differences between parents who administered pain medication, and parents who did not through the entire 14 days. In addition, descriptive statistics were used to analyze daily face pain scores, and their correlation to the administration of medication for that particular day. The sum of the Medication Attitude Questionnaire (MAQ) scores for avoidance, fear of side effects, and appropriate use were examined for their relationship with the use of medication using analysis of variance (ANOVA). ANOVA was also used to examine the relationship between the use of medication compared to the total scores for state and trait anxiety for both parent and children. The total number of medication administrations across the 14 days was summed and a bivariate correlation test was performed between the total number of administrations and MAQ as well as STAI scores.

RESULTS

Demographics

Table 1 details the pertinent demographic information obtained for the study. The majority of the participants were

Table 1. Child demographics

Child Age (years)	
Mean	8.31
SD	4.09
Child Gender (%)	
Male	62.7%
Female	37.3%
Child Race (%)	
Hispanic/Latino	35.3%
African American	2.0%
Asian	11.8%
White	47.1%
More than one race	3.9%

male, average age was 8.31±4.09 years, and most were Caucasian. The mean parental education levels for parents who completed the questionnaires are detailed in table 2. ANOVA revealed a significant difference in parental education levels between parents who administered medication and those who did not (p = 0.01).

Table 2. Parental education and use of pain medication

		Used analgesic medication	No analgesic medication used
Parental education levels (years)	Mean	16.60	14.11
	SD	2.37	2.40
	p value	0.01**	

Reasons why parents did not administer medication

Out the total study population (n=51), 17 parents administered medication at least once while 34 parents did not for the entire14-day period. Parents were asked to provide reasons for each day that no medication was administered to their child. Parents reasoned that no medication was provided because the child was not in pain 79% of the time. Daily-face pain scale scores were cross-matched with the reasons why no medication was given to the child. It was found that 57% of the time (8 out of 14 days), medication administration was withheld even when at least one child reported clinically significant pain (face-pain scale scores ≥ 3).

Table 3. Anxiety and use of medication mean differences

		Used Analgesic Medication	No Analgesic Medication Used
Parent State Anxiety	Mean	43.73	38.30
	SD	12.15	10.83
	p value	0.135	
Parent Trait Anxiety	Mean	43.93	40.00
	SD	8.57	9.87
	p value	0.198	
Child State Anxiety	Mean	30.40	30.85
	SD	5.90	5.71
	p value	0.885	
Child Trait Anxiety	Mean	32.14	27.47
	SD	5.08	4.34
	p value	0.04**	

Anxiety and the use of pain medication

ANOVA was used to determine differences in anxiety (parent STAI and child STAIC) were present between the medication and non-medication group. The means of the scores for both groups are shown in Table 3. There were no significant relationships

between parental state-anxiety, parental trait-anxiety, and child state-anxiety and the use of pain medication. On the other hand, ANOVA showed that child trait-anxiety scores between the medication and non-medication group were significantly different. Bivariate correlations were also run between child and parent anxiety and the total number of doses of medication administered to children across the 14 days (Table 4). Parent anxiety (STAIs and STAIt), and child state anxiety (STAICs) were not correlated with total medication doses. However, child trait anxiety (STAICt) showed a positive significant relationship with the number of times medication was administered (p = 0.002).

Table 4. STAI and frequency of medication administration bivariate correlation
Note. STAI – State-Trait Anxiety Inventory
** denotes p value ≤ 0.05

	Parental State Anxiety	Parental Trait Anxiety	Child State Anxiety	Child Trait Anxiety
***R* value**	-0.100	-0.126	0.263	0.583**

Attitudes and the use of pain medication

ANOVA was used to determine if MAQ mean score differences were present between parents who administered medication and those who did not. Table 5 shows the calculated MAQ scores for all three of its factors: avoidance, fear of side effects, and appropriate use. *MAQ Appropriate use* showed significant differences between the medication and non-medication groups. *Avoidance* showed a relationship with the use of medication trending towards significant differences, while the mean differences for the *Fear of side effects* subscale were insignificant. Bivariate correlations were run between MAQ scores

Table 5. MAQ and use of medication mean differences
Note. MAQ – Medication Attitude Questionnaire

Medication Attitude Questionnaire Subscale		Used Analgesic Medication		No Analgesic Medication Used
Avoidance	Mean	22.00		26.23
	SD	6.78		9.80
	p value		0.09*	
Fear of Side Effects	Mean	22.29		22.10
	SD	2.73		3.90
	p value		0.88	
Appropriate Use	Mean	20.12		17.69
	SD	3.84		3.36
	p value		0.03**	

and the total number of times the parent administered medication to their child, which revealed no significant relationships ($p \leq 0.05$).

DISCUSSION

The purpose of this study was to determine the relationship between parental anxiety and the use of and administration of pain medication in pediatric cancer patients. The study intended to determine if more anxious parents administer medication more or less frequently than less anxious parents. The study also aimed to determine if there is a significant relationship between parental attitudes toward medications and its administration. Findings showed that parental education levels and the administration of medication were significantly related. In terms of state and trait anxiety, only child trait anxiety showed significant mean differences and correlations between the medication and non-medication groups. In addition, differences in parental attitudes about pain medication were different significant between parents who administered medication and those who did not. However, there was no correlation between medication attitudes and the number of times medication was administered.

More educated parents were more likely to administer pain medication to control their children's pain symptoms. It is likely that the more educated the parents are, the more aware they become of when their child is in pain. Less educated parents may not be aware of the signs to look for regarding their child's pain. Furthermore, the study suggested that parents may not be providing adequate pain medication to treat their child. No medication was administered 57% of the time even though the face-pain scale suggested that at least one child was experiencing clinically significant pain. Children may not have been expressing their pain enough for the parents to recognize it. In addition, parents may have different perceptions on what constitutes significant pain.

The study results did not support the hypothesis that more anxious parents will medicate their child more. Parental anxiety did not show a significant relationship with the use of pain medication. Although the medication and non-medication groups did show a difference in their corresponding STAI scores, ANOVA showed that the mean differences were insignificant. Child trait anxiety was significantly related to the administration of medication. The more anxious child may show increased stress response that parents may interpret as pain. This is important to note, as less anxious children may show decreased verbalization of pain, leading to the possibility of undermedication.

Parental attitudes toward pain medication also affected the administration of medication to children. Parents who administered medication showed significantly lower *Medication Attitude Questionnaire Avoidance* and higher *Appropriate use* scores. Thus parents who administered medications were more likely to believe that pain medication can be used in children without developing dependence. Additionally, parents who administered medication felt that the situations when they gave medication to their children was timely and appropriate for the amount of pain that the child was experiencing. The findings of the study were consistent with its hypothesis that more favorable medication attitudes lead to the use of medication. However, the number of medication doses administered did not have a significant relationship with attitudes towards medications. Parents from the medication group may have less reservations and misconceptions in using pain medication to control their child's pain, but they still may not have adequately managed it. In a study conducted to examine pain management at home after undergoing a tonsillectomy, Sutters and Miaskowski discussed that the child may achieve temporary pain relief after the parent administers analgesic medication. However, if the parent fails to sustain treatment, the pain relief may be insignificant to the overall pain intensity

reduction (Sutters and Miaskowski, 1997). Thus, attitudes towards pain medication may not accurately predict whether or not the child's pain is adequately treated. There was not much difference seen between the medication and non-medication groups in terms of their *Fear of side effects* scores. This may be explained by the risk-reward perception of parents responsible for managing their children's pain. The medication group may have been composed of parents who feel that the rewards of pain relief outweigh the possible side effects.

The significance of this study lies in its clinical implications. Firstly, less educated parents may not have access to adequate information regarding their child's care. This deficiency is something that health care providers can address and supplement with interventions at the clinical setting. Health care professionals can counsel parents and provide information on the important signs to look out for regarding their child's pain. Secondly, physiological pain predictors supplemental to self-report may be used to better ascertain the child's pain. Parents may be trained in simple procedures such as obtaining the child's heart rate and skin conductance in order to better quantify their child's pain (Howard, 2004). Admittedly, there would be difficulty implementing such measures to accurately know the child's pain level. However combining psychological and physiological signs of pain may provide parents a better idea on how much pain their child is really in. Lastly, a similar study using a larger sample size can be done in order to obtain better statistical power. Most of the factors in the study were trending to significance, and may have achieved significance given a bigger study population.

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