

ORIGINAL ARTICLE

Postoperative pain management in Latino families: parent beliefs about analgesics predict analgesic doses provided to children

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What is already known

- Current postoperative pain literature suggests that Latino parents hold more misconceptions on children's pain and higher levels of avoidance of analgesics and fear of side effects compared to non-Latino White parents.

What this article adds

- This study found that parents' perceptions of analgesics for children *impact* home-based analgesic administration in a sample of Latino families of low socioeconomic status.

Keywords

ambulatory surgery; adolescents; Hispanic; health disparities

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Summary

Background/Objectives: The present study examined whether parental perceptions of children's pain impacted home-based pain management following outpatient surgery in a sample of Latino families from low socioeconomic backgrounds.

Methods: Latino parents of children ($n = 161$) who underwent outpatient surgery were recruited for this study and completed measures assessing attitudes on pain and analgesic use (Parental Pain Expression Perceptions and Medication Attitudes Questionnaire) before their child's surgery. Parents also rated their child's pain after their child's surgery using the Parent Postoperative Pain Measure and collected data on the amount of analgesics they gave to their child on the first postoperative day. Hierarchical regression analyses examined whether parental attitudes predicted pain assessment and management at home.

Results: A majority of parents reported multiple misconceptions regarding children's pain and fears of side effects as well as avoidance of analgesic use. For example, over 80% reported believing that a child always tells their parents when they are in pain. Hierarchical regression analyses found that more fear and avoidance regarding analgesic use for children's pain predicted parents providing fewer doses of analgesic to their children on the first postoperative day ($\beta = -0.21, P = 0.028$).

Conclusions: Preoperative parents' beliefs regarding analgesics for treatment of children's pain may adversely *impact* parent postoperative analgesic administration at home in Latino families.

Introduction

Existing literature on postoperative pain management documents clinically significant levels of pain despite medical advances in postoperative pain management. Postoperative pain is associated with patient recovery (1,2), satisfaction (3–6), and readmission after surgery (7). Mechanisms underlying pediatric postoperative pain management are important to examine especially among youth at risk for health disparities in pain management, such as Latino youth (8). While it is important to recognize the role social determinants of health, such as socioeconomic status (SES), play in pediatric postoperative pain management, it is also vital to identify modifiable factors contributing to undermanaged pain in order to affect change in clinical care.

With the rise in number of pediatric outpatient surgeries, it is the parents who are increasingly challenged with managing their child's pain at home (9). One of the challenges in conducting postoperative pain research is accessing families at home compared to the hospital, where most existing postoperative studies take place. This can be particularly challenging in communities that have been historically marginalized and underserved, such as low-income and impoverished communities (10,11). Consequently, studies examining postoperative management at home are limited, and a dearth of studies take place in under-resourced Latino communities.

Existing literature on home-based postoperative pain management has found that parental decision-making regarding postoperative pain management in children is a complex process impacted by multiple factors including parental attitudes and beliefs regarding children's experience of pain and approach to pain management (12,13). Studies have documented significant parental misconceptions regarding children's pain, including manifestation of pain, as well as fears about the safety of analgesic use for pain management. Few studies have examined the relation between parental beliefs on child pain and analgesic use, and the frequency with which analgesic doses are provided to children and adolescents at home after surgery. In a previous study conducted by the present research group, parental beliefs regarding pain and analgesics predicted fewer doses of analgesics during the postoperative period above and beyond observed pain levels, child age, and gender (14). Sample demographics of this previous study, however, mainly consisted of high-income, non-Latino White (NLW) families. As such, findings from the present study may be more pronounced in Latino from low SES backgrounds.

Existing adult pain literature documents ethnic health disparities in the context of surgery, disproportionately

affecting Latinos among other groups compared to non-Latino Whites. We submit that there is a critical need for expanding the knowledge base on health care disparities in *pediatric* postoperative pain as well (15). Furthermore, as part of studying pediatric pain health disparities, we submit that it is important to be cognizant of within-group heterogeneity and describe groups based on SES *and* ethnicity (16). Although SES may be closely associated with ethnicity/race, it is important to note that these two variables are not identical in health disparities literature (17). For example, for Latino youth, parent education has been an inconsistent predictor of children's health; that is, children of more educated Latino parents do not always fare better than less educated Latino parents. As such there is a need for studies that clearly define groups in terms of both SES *and* ethnicity/race in order to better understand mechanisms underlying health disparities.

Existing pediatric chronic disease literature (e.g., asthma) has identified treatment barriers for Latino youth from urban communities related to parent knowledge of medical conditions and attitudes toward medication use (18). Similarly, our research group has found that in the context of outpatient pediatric surgery, Latino parents endorsed more misconceptions regarding pain (19) and analgesics compared to NLW. Data previously reported from the NIH-funded study that this present manuscript is based on describes low rates of postoperative analgesic use in a sample of Latino youth (20). To date, however, no study has examined the question of whether in a Latino low-income population parent misconceptions regarding pain and treatment of pain are associated with parental pain assessment and analgesic administration after surgery.

As such, the aim of this current study was to examine if *preoperative* attitudes and beliefs regarding pain and analgesic use are directly associated with *postoperative* pain assessment and analgesics administration in a low-income Latino sample. We submit that this study contributes to the field of pediatric pain management by further elucidating factors underlying parental decisions on postoperative pain management within Latino groups at risk for postoperative pain disparities.

Methods

Participants

Data presented in this manuscript were obtained from a National Institute of Child Health and Development (NICHD)-funded study examining ethnic health care disparities in postoperative pain management in Latino youth from low-income households (defined using

federal poverty guidelines). Data in this manuscript represent secondary aims of the original study design. Recruitment for the study took place between the years 2012 and 2014 at Children's Hospital of Orange County (CHOC Children's). Descriptive data on analgesic doses from this NICHD-funded study were previously reported (20). Exclusionary criteria included children with American Society of Anesthesiologists (ASA) classification III or IV (i.e., patients with severe or life-threatening systemic disease) (21), significant developmental delay, chronic illness, or premature birth. From 197 participants recruited, 23 (12%) dropped from the study before completing baseline packets (e.g., were unable to mail data), and 13 (7%) did not sufficiently complete follow-up data to be considered in the analyses. Chi-square analyses to examine differences among participants who dropped and those who completed the study revealed no differences in parent preferred language (English/Spanish) or type of surgery (P ns). The sample presented in this manuscript consisted of 161 parents and child dyads that completed the first day of follow-up data. Children were between the ages of 2 and 15 years and underwent outpatient surgery, including otolaryngologic (exclusively tonsillectomy and/or adenoidectomy procedures; $n = 130$, 81%), orthopedic ($n = 16$, 10%), general ($n = 8$, 5%), and urological ($n = 7$, 4%) surgeries. Approval for this study was granted by the CHOC Children's Hospital Institutional Review Board.

Measures

Participant demographic information such as patient and parent gender, age, ethnicity, race, nativity, preferred language, education level, and household income was collected.

Parental pain expression perceptions (PPEP)

This measure is comprised of nine questions rated on a 7-point Likert-type scale (22). Questions measure parental knowledge and attitudes regarding children's experience and expression of pain. A total PPEP score, calculated by summing all items, was used for analysis in the current study. Higher scores indicate more misconceptions regarding pain in children. The PPEP has demonstrated good content and construct validity, and internal consistency has been found to range $\alpha = 0.78$ – 0.79 . The current study also found good internal consistency for the PPEP ($\alpha = 0.80$).

Medication attitudes questionnaire (MAQ)

Parental attitudes about use of analgesics for pain were assessed using the MAQ, which is comprised of 16 items

rated on a 7-point Likert-type scale (23). Questions assess attitudes and beliefs regarding use of analgesics for child pain. The MAQ has three subscales: Avoidance, Fear of Side Effects, and Appropriate Use. A composite score was obtained by summing the Avoidance and Fear of Side Effects subscales, with higher scores reflecting more attitudinal barriers toward analgesic use for children's pain. Higher scores on the appropriate use scale indicate more accurate analgesic beliefs. The MAQ has demonstrated good content, and predictive and construct validity. Internal consistency has ranged from $\alpha = 0.68$ to 0.77 , and was 0.77 in the current study.

Postoperative pain assessment and analgesics—parents postoperative pain measure (PPPM)

Children's postoperative pain was assessed using a validated 15-item observational checklist with which parents can rate presence of behavioral changes perceived to be related to pain severity. Parents respond 'yes' or 'no' for each item, and scores are calculated using a cut-off score of six affirmative responses to indicate clinically significant pain. The PPPM has demonstrated good specificity and internal consistency ($\alpha = 0.88$) (24). It has been validated for use in children as young as 2 years of age. The current study found excellent internal consistency $\alpha = 0.92$. Due to changes in the protocol of the larger study, PPPM questionnaires were added to the study protocol after recruitment began such that only the last 94 participating families recruited completed this measure.

Analgesics administration

Parents were asked to complete daily diaries outlining each analgesic dose (including type of analgesic and total milligrams per milliliters) provided to children at home for up to 7 postoperative days. For the purposes of this study, only the first full postoperative day at home was included in analyses because that is the day children tend to experience the highest levels of pain (25).

Procedure

After consent and assent were obtained from parents and children respectively in their preferred language (English or Spanish), measures assessing attitudes toward pain and medication were provided to parents during the preoperative period. After surgery, all patients and their parents received written standard recommendations for analgesic use (e.g., instructions to administer acetaminophen as directed in over-the-counter medication packaging every 4 h until pain remits) in the postanesthesia care unit in their

preferred language. Most children received doses of acetaminophen (48%), followed by codeine (19%), ibuprofen (16%), and hydrocodone (16%) on the first postoperative day.

Parents were also instructed to complete the daily pain and medication record forms at home. To address challenges with retention of minority research participants in disparities studies, vetted procedures to increase trust and decrease attitudinal, logistical, and instrumental barriers related to accessibility (26) were employed. As recommended by Yancey and colleagues, the same research associates worked with families throughout the research process (i.e., recruitment, follow-up calls, and home visits) to aid with participant trust and retention (26). In order to address barriers related to accessibility, data were collected on the day of surgery at the hospital and two follow-up visits at patient's homes. Parents were instructed to complete day 1 questionnaires prior to the first home visit. The main purpose of home visits was to address any questions regarding completing measures, and to conduct a semi-structured interview as part of the larger study.

Statistical analysis

Descriptive statistics were utilized to analyze parent responses on attitudes and pain assessment. Means and standard deviations were reported for normally distributed data, and medians and interquartile ranges (IQR) were reported for skewed data. Hierarchical linear regression analyses were conducted to examine whether parental attitudes and beliefs regarding pain and use of analgesics predicted pain assessment and management. Children's age and gender were controlled for in regression analyses in order to account for developmental and gender-socialization confounding effects on parents' assessment of pain. Statistical significance was determined by *P* values < 0.05. Analyses were completed using SPSS statistical software version 21 (IBM, Armonk, NY, USA).

Results

Participants

The sample consisted of 161 families. Sixty-six percent of parents were from Mexico, 24% from the US, and 10% from Central and South America. The majority of parents (71%) reported Spanish as their preferred language. Ethnic breakdown is reflective of the demographic profile of Latinos in California (27). Additional demographic information of participants is presented in Table 1. Median annual household income (i.e., \$19,200

[average household size = 4.5]) was below US poverty threshold for families of that size (i.e., \$27,910) (28) and lower than the median income of Latino households from California (\$43,800 [average household size = 3.9]) (27).

Parent attitudes and beliefs regarding children's experience of pain and analgesic use

Parent responses to PPEP questions are presented in Table 2. Overall, most parents in this sample endorsed misconceptions regarding children's experience and expression of pain. For example, over 80% of parents reported believing children always tell parents when they are in pain, and 76% believed children immediately report pain upon onset. Approximately 82% believed that children always express pain by crying or whining. Parent responses to MAQ items assessing beliefs and attitudes regarding analgesic use are presented in Table 3. The majority of parents (64%) endorsed concerns about potential medication side effects. Furthermore, approximately 64% endorsed believing that analgesics should be taken as little as possible, such as in cases of severe pain. Parents were less concerned about analgesics leading to future addiction. For example, 70% of parents endorsed the belief that children can learn to take pain medications responsibly.

According to parent ratings, 61% of children experienced clinically significant pain (i.e., PPPM value over 6 or more affirmative responses) on the first postoperative day. The median level of pain was also clinically significant (8, IQR: 3.4–13.0). Table 4 lists rates of children's pain severity symptoms on the first postoperative day.

Table 1 Demographic information

Parameter	<i>n</i> = 161
Child age (years) mean ± sd	7.4 ± 3.6
Sex of child (Male) (%)	95 (61.3)
Relationship with child (%)	
Mother	144 (89.4)
Father	12 (7.5)
Other	5 (3.1)
Mother age (years) mean ± sd	34.8 ± 7.5
Father age (years) mean ± sd	37.1 ± 7.6
Parental marital status (%)	
Married/Partnered	109 (67.7)
Single	26 (16.1)
Divorced/Separated	12 (7.5)
Widowed	1 (0.6)
Other/missing	13 (8.1)
Household income median (IQR)	\$19 200 (1455–21 450)
Parent education years (median, IQR)	
Mother	11.0 (7.75, 12.0)
Father	10.0 (7.0, 12.0)

Table 2 PPEP Parent responses %

	Disagree % ^a	Uncertain %	Agree % ^b
Children in pain have trouble sleeping	5.7	3.8	90.6
Children always tell their parents when they are in pain	13.8	0	86.2
Children always express pain by crying or whining	15.7	1.9	82.4
Children experiencing pain report it immediately	19.2	5.1	75.6
Children who are playing are not in pain	33.1	7.6	59.2
Children who are quiet are not in pain	42.6	9.0	48.4
Children exaggerate pain	43.9	17.2	38.9
Children complain about pain to get attention	45.3	18.2	36.5
Children feel pain less than adults	62.0	19.6	18.4

^aDisagree = strongly disagree + disagree + slightly disagree.

^bAgree = strongly agree + agree + slightly agree.

Table 3 Parent MAQ responses (%)

MAQ Avoidance and Fear of Side Effects Scales	Disagree % ^a	Uncertain %	Agree % ^b
Side effects are something to worry about when giving children pain medication	18.1	15.0	66.9
Pain medication works best if saved for when the pain is quite bad	26.4	10.1	63.5
The less often children take pain medication for pain, the better the medicine works	28.0	17.8	54.1
There is little need to worry about side effects from pain medication	28.3	18.2	53.5
Pain medication is addictive	27.0	27.7	45.3
Pain medication works best when it is given as little as possible	34.6	20.8	44.7
Pain medication works the same no matter how often it is used	45.2	24.2	30.6
Children who take pain medication for pain may learn to take drugs to solve other problems	46.8	24.1	29.1
Children will become addicted to pain medication if they take it for pain	50.6	20.3	29.1
Using pain medication for children's pain leads to later drug abuse	50.3	27.7	22.0
MAQ Appropriate Use Scale			
Children learn how to use pain medication responsibly when it is given for pain	15.6	14.4	70.0
There is little risk of addiction when pain medication is given for pain	22.0	22.0	56.0
Giving children pain medication for pain teaches proper use of drugs	25.5	22.3	52.2
It is unlikely a child will become addicted to pain medication if taken for pain	30.6	23.8	45.6

^aDisagree = strongly disagree + disagree + slightly disagree.

^bAgree = strongly agree + agree + slightly agree.

Despite high proportions of clinically significant pain, 57% of children with clinically significant pain did not receive recommended doses of analgesics (i.e., 4–6 doses per day). For detailed information regarding analgesic use see Brown *et al.* (20).

Parent Attitudes and Beliefs as Predictors of Pain Assessment and Management

Hierarchical multiple linear regression analyses were conducted to assess whether preoperative parent beliefs regarding children's pain predicted postoperative parent assessment of children's pain (Table 5). Results indicated that parent attitudes and beliefs regarding children's pain did *not* significantly predict parental assessment of child pain ($P = 0.74$).

To examine whether parent preoperative beliefs regarding analgesic use predicted postoperative pain management, two hierarchical multiple linear regression analyses were conducted on frequency of analgesics administered by parents. The first analysis examined the predictability of the appropriate use (i.e., MAQ Appropriate Use subscale), and the other examining the predictability of the MAQ Fear of Side Effects and Avoidance subscale composite. Results indicated that parental fear and avoidance of analgesics significantly predicted pain management above and beyond pain severity, child age, and gender. That is, parents who reported more fear and avoidance were more likely to provide fewer doses of analgesics to their children on the first postoperative day ($\beta = -0.21$, $P = 0.028$).

Table 4 Proportions of parental PPPM responses on postoperative day 1

PPPM Items	Yes, %
Active and loud behaviors	
Cry more easily than usual	40.0
Whine or complain more than usual	43.3
Groan or moan more than usual	45.2
Quiet and withdrawn behaviors	
Have less energy than usual	62.9
Play less than usual	61.0
Not doing the things he/she normally does	53.8
Act more quiet than usual	63.5
Other	
Try not to bump or use the sore part of his/her body	51.4
Eat less than usual	58.7
Want to be close to you more than usual	63.8
Hold the sore part of his/her body	50.0
Look more flushed than usual	31.4
Refused to eat	37.5
Take medication when he/she normally refuses	27.6
Act more worried than usual	63.5

Table 5 Hierarchical linear regression: Attitudes as predictors of pain and analgesic use

Parameter	β	SE	P
Child pain (PPPM) as outcome variable, Pain Perceptions (PPEP) as predictor			
Child gender	0.118	1.082	0.266
Child age	-0.167	0.137	0.114
PPEP	0.035	0.054	0.743
$F(3, 87) = 1.28$, Adjusted $R^2 = 0.009$, $P = 0.743$			
Doses of analgesia as outcome variable, MAQ Misconceptions Composite as predictor			
PPPM	0.453	0.034	<0.001
Child gender	-0.531	0.349	0.132
Child age	0.058	0.044	0.536
MAQ Misconceptions	-0.207	0.013	0.028
$F(4, 89) = 7.91$, Adjusted $R^2 = 0.237$, $P = 0.028$			
Doses of analgesia as outcome variable, MAQ Appropriate Use Scale as predictor			
PPPM	0.476	0.036	0.001
Child gender	-0.144	0.353	0.132
Child age	0.057	0.045	0.548
MAQ Appropriate Use	-0.169	0.034	0.081
$F(4, 89) = 7.31$, Adjusted $R^2 = 0.221$, $P = 0.081$			

Conclusions

Under the conditions of this study we found that parents with higher levels of fear and avoidance of analgesic use for children provided fewer doses of analgesics to manage children's postoperative pain. The role of parent beliefs on analgesic use is important to con-

sider given the high frequency with which parents report analgesic fears (e.g., more than half endorsed believing that analgesics could lead to negative side effects) (14). Results of this study have important implications for home-based postoperative pain management among Latino children, a group for which health disparities in pain exist and are also pervasive across health domains.

It is important to understand the relationship between parent beliefs and pain management at home in the context of health determinants and disparities in the U.S. Within the social gradient of health risk factors, Latino youth from low SES households are particularly at risk for less access to health determinants (e.g., education, higher paying jobs, and health resources). In addition, Latinos groups face greater risk for receiving suboptimal medical care, including disparities in access to care, quality of care, and parent-provider language barriers (8,29–32). Within this historical context of disparities, it is reasonable that parents may mistrust or question health care provider recommendations. These are important considerations when examining parents' decision-making regarding children's pain management. It is possible that parents who have reservations about analgesics use them more sparingly (e.g., for instances of high pain) or until they have exhausted other options. That is, in a cost-benefit analysis, low-income Latino parents may see pain as less threatening for their children's long-term health compared to analgesic use.

Findings in the current study underscoring the importance of parental beliefs regarding analgesics were also found by Zisk and colleagues in their examination of NLW families from high SES backgrounds. However, in the NLW sample fear of analgesic side effects were predictive of number of analgesic doses provided to children only for participants who endorsed the most extreme degrees of fears in the high-income NLW sample. It is possible that for the latter group, moderate levels of fears are buffered by better access to resources making this group less susceptible to higher levels of postoperative pain.

Another important consideration in examining postoperative pain management is how pain management is defined in research and by the diverse populations studied. While over-the-counter analgesics (e.g., acetaminophen) are recommended as a reliable treatment for children's postoperative pain, family approaches to pain management are often multifaceted; for example, in addition to analgesics, families may use complementary or alternative medicine (33), distraction, prayer, or may socialize children to be stoic and normalize pain as a natural occurrence. Previous pediatric studies have found that Latinos receive fewer doses of medication for

pain postsurgery than recommended and fewer compared to non-Latino White patients. Taken in isolation, analgesic use is not a definitive picture of management at home. However, even if other pain management methods were utilized, most youth experienced clinically significant levels of pain, suggesting their pain was under-controlled. Further research is needed to better understand parent pain management decision-making (e.g., how decisions are made, who among family members contributes to decisions, cultural values that are prevalent, etc.) in order to develop culturally tailored interventions for pain management (34).

While most parents reported misconceptions about children's experience and expression of pain, misconceptions did not appear to impact their assessment of their child's pain. These results also replicate findings from Zisk *et al.* (14), further suggesting generalizability among diverse groups. It is possible that general child pain assessment knowledge is not as important as other factors such as parent expertise on their child's behavior. Therefore, providers should consider the potential limited utility of teaching parents how to assess pain. Rather, future research should examine modifiable factors related to parent pain management decisions.

Several methodological limitations of the present study should be noted. First, the reliance on self-reported analgesic administration without comparison to objective measures can introduce impression management bias. In addition, statistically examining the unique contribution of ethnicity and SES in pain assessment and management (i.e., whether confounding effects and high multicollinearity exist) was beyond the purview of the current study. The issue of overlap between ethnicity/race and SES is a common issue in health and health disparities research (17). However, the association between race/ethnicity and SES should not be discarded as spurious, but one that represents historical nonrandom distribution of wealth, educational

resources, and other factors that are health determinants (17,35). While research suggests that it is challenging to disentangle the contribution of ethnicity/race and SES, empirical evidence from large studies underscore their unique importance (17). Future studies should include group comparisons in order to further elucidate presence of disparities in postoperative pain management and to determine whether SES factors buffer risks for undermanaged pain in at-risk ethnic/racial groups. Finally, there is a need for more studies that examine the presence of short- and long-term pain outcomes for Latino youth.

Overall, findings of this report suggest that health care providers should be attuned to the possibility of beliefs regarding analgesic use among families from diverse ethnic and SES backgrounds in a sample of youth at risk for pain related health disparities. Children of parents who hold more accurate knowledge of analgesics are more likely to receive optimal numbers of analgesics doses. We suggest findings of this current study should be used for developing interventions to prevent and better treat postoperative pain in this at-risk population.

Ethics approval

IRB approval: Name: 1002200 Ethnicity and Postoperative Pain in Children. Date of approval 9/11/2012. Reference ID: 371396-16.

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Conflict of interest

The authors report no conflict of interest.

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