

# Mothers' beliefs about analgesia during childhood immunization

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**BACKGROUND:** Immunization injections are the most common painful medical procedures experienced during childhood, yet there is a discrepancy between recommendations for the effective use of topical anesthetics to reduce vaccine injection pain and actual practice.

**OBJECTIVE:** To improve our understanding of mothers' experiences and practices regarding their children's routine immunizations.

**METHOD:** Adopting an interpretive, naturalistic paradigm, semi-structured interviews were conducted with 15 mothers to examine their perceptions and experiences of their children's immunization pain and pain management.

**RESULTS:** The findings demonstrated three main themes: attitudes toward immunization pain, immunization pain management and physicians as sources of information. Participants described feeling distressed while their children were being immunized, but most managed these difficulties by focusing on the benefits of immunization and by minimizing or justifying the pain. All of the participants used non-pharmacological techniques to manage immunization injection pain. Few mothers were aware of the availability of topical anesthetics. When participants did use pharmacological analgesic approaches, oral analgesics were most likely to be used for prophylaxis and treatment of fever, and participants were unaware of evidence-based approaches to managing pain. Participants viewed their physicians as trusted sources of information, and the majority said that they would likely use a topical anesthetic in the future if recommended or approved by their physician.

**CONCLUSION:** The present findings provide direction for future knowledge translation activities to enhance the knowledge of mothers and clinicians regarding pain during immunization injections and its effective management.

**Key Words:** Child; Immunization; Infant; Pain management; Qualitative research; Topical anesthetics

Immunization injections are the most common painful medical procedures experienced during childhood, causing substantial distress for children, their families and health care workers (1-3). Immunizations are performed repeatedly throughout infancy and childhood, with the number steadily increasing over time. In addition to causing acute pain, repeated immunizations can lead to preprocedural anxiety, needle fears and health care avoidance behaviours. Further vaccine administration may also be resisted

## Les croyances des mères au sujet de l'analgésie pendant la vaccination des enfants

**HISTORIQUE :** Les injections de vaccin sont les interventions médicales douloureuses les plus courantes pendant l'enfance, mais il existe un écart entre la pratique et les recommandations relatives à l'utilisation efficace de l'anesthésie topique pour réduire cette douleur.

**OBJECTIF :** Améliorer nos connaissances des expériences et des pratiques des mères au sujet de la vaccination systématique de leur enfant.

**MÉTHODOLOGIE :** Au moyen d'un paradigme interprétatif et naturaliste, les chercheurs ont effectué des entrevues semi-structurées avec 15 mères afin d'examiner leurs perceptions et leurs expériences au sujet de la douleur que ressent leur enfant pendant la vaccination et de la prise en charge de cette douleur.

**RÉSULTATS :** Les résultats font ressortir trois grands thèmes : les attitudes envers la douleur causée par la vaccination, la prise en charge de cette douleur et les médecins à titre de sources d'information. Les participantes ont décrit se sentir désemparées pendant que leur enfant se faisait vacciner, mais la plupart ont géré cette difficulté en se concentrant sur les bienfaits de la vaccination et en minimisant ou en justifiant la douleur. Toutes les participantes ont utilisé des techniques non pharmacologiques pour gérer la douleur causée par l'injection du vaccin. Peu de mères connaissaient l'existence d'analgésiques topiques. Lorsqu'elles utilisaient des analgésiques pharmacologiques, les analgésiques oraux les plus susceptibles d'être utilisés visaient la prophylaxie et le traitement de la fièvre, et les participantes n'étaient pas au courant des méthodes probantes pour prendre en charge la douleur. Les participantes percevaient leur médecin comme une source d'information fiable, et la majorité ont affirmé qu'elles utiliseraient probablement un anesthésique topique à l'avenir si leur médecin en recommandait et en approuvait l'usage.

**CONCLUSION :** Les présentes observations orientent les futures activités de transfert du savoir en vue d'accroître les connaissances des mères et des cliniciens au sujet de la douleur pendant les injections de vaccin et de la prise en charge efficace de cette douleur.

(3), contributing to the risk of resurgence of vaccine-preventable diseases (4).

Research evidence clearly demonstrates the effectiveness of topical anesthetics for reducing immunization pain in children of all ages (5). We previously surveyed mothers and paediatricians regarding analgesic practices during childhood immunization (16) and demonstrated that topical anesthetics were rarely used, revealing a gap between evidence and practice, and a lack of effective pain management.

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**TABLE 1**  
**Demographic characteristics of participants**

Attribute	Distribution, n (%)
Age, years	
20–24	1 (6.6)
25–29	3 (20.0)
30–34	6 (40.0)
35–39	4 (26.6)
40–44	1 (6.6)
Number of children (excluding newborn infants)	
1	8 (53.3)
2	5 (33.3)
3	2 (13.3)
Ages of children* (excluding newborn infants), years	
<2	2
2–3	9
4–6	6
7–8	2
>8	3
Highest level of education completed	
High school	5 (33.3)
College	4 (26.6)
University	5 (33.3)
Postgraduate training	1 (6.6)
Ethnicity	
White	8 (53.3)
Black	3 (20.0)
Filipino	2 (13.3)
Chinese	1 (6.6)
West Asian	1 (6.6)
First language	
English	10 (66.6)
Other	5 (33.3)
Length of time in Canada, years	
0–10	4 (26.6)
11–20	3 (20.0)
21–30	1 (6.6)
Whole life	7 (46.6)

\*Data are missing for two participants

The uptake of topical anesthetics depends on characteristics such as their relative advantage, compatibility with values, costs, risks, trialability, strength of evidence, patients' and professionals' attitudes and knowledge, social norms, health professionals' interactions with patients and families, as well as practice routines (7). We performed a qualitative study to further examine mothers' perceptions and experiences of their children's immunization pain and pain management.

## METHODS

### Participants

After the delivery of a newborn infant, mothers on the postnatal ward at Mount Sinai Hospital (Toronto, Ontario) were invited to participate. The hospital serves patients from a wide geographical region, enabling the participation of mothers from diverse educational and ethnic backgrounds. This setting was convenient because women were available to be interviewed. Twenty-seven women were approached: 12 women declined, resulting in

15 participants. A purposeful sample (8) was taken to ensure a broad representation in terms of age, number of children, level of education completed, ethnicity, religion, first language and length of time living in Canada. The demographic characteristics of the study participants are presented in Table 1.

### Data collection and analysis

A semistructured interview guide was developed based on the literature and experiences of the study team. It included open-ended questions about participants' experiences with their children's immunization, measures undertaken to alleviate discomfort, and beliefs, attitudes and knowledge regarding pain and pain management. The interview guide evolved during the data collection period to focus on key themes emerging from the data. All interviews were conducted by one researcher (EP), with each lasting approximately 20 min. Interviews were conducted between January and July 2008. Interviews were audio recorded and transcribed verbatim. Participants completed a demographic form at the end of the interview.

Qualitative content analysis was used to generate codes inductively from interview transcripts (9). Line by line coding was performed independently by two researchers, and disagreements were discussed until a consensus was reached; the researchers also looked for relationships among the codes. The software package QSR NVivo (version 7.0, QSR International, Australia) was used to organize and manage the data. Data collection and analysis occurred simultaneously until saturation of the key emerging themes occurred. Saturation is the point in a qualitative study when no new data are generated from data collection and categories of theoretical interest have been fully characterized (9). Redundancy of themes was observed after 13 interviews, and two additional interviews were conducted to confirm that saturation had been achieved.

The study was approved by the hospital and university ethics boards, and participants signed a consent form.

## RESULTS

The results have been categorized into three main themes: attitudes toward immunization pain, immunization pain management and physicians as sources of information.

### Attitudes toward immunization pain

Participants expressed difficulty watching their children get immunized: "There is obviously some pain" (interview #13). They described feelings of distress when watching their children being immunized, but most managed these difficulties by focusing on the recognized benefits of immunization and by minimizing or justifying the pain felt as a normal part of immunization injections, as demonstrated by the following quotes: "I think the first time was a little traumatizing, but you know, I think [immunization] was doing her more good than harm" and "It's just a necessary evil that I deal with" (participant #3).

Eight participants discussed the importance of stoicism, and the need to "tough it out" (participant #8), and a

couple of participants said that experiencing pain at a young age would prepare their children to deal with pain, which everyone experiences, in the future.

Participants believed that most children have some degree of fear of doctors and needles, and that this fear is more distressing for their children than the actual pain of the needle. One mother noted that her child recognized the “woman who did the shots” and “didn’t like her very much” (participant #3). Another participant described a recent trip to the doctor’s office: “My daughter, for instance, she was just screaming at the top of her lungs...and then he was finished. She didn’t even know she got a needle. So I think they’re scared of needles. That’s why they think its painful” (participant #10).

Some participants described fear as short term, and that once they stopped getting vaccinations, they would “grow out of it” (participant #4).

Some participants attributed fear of needles to factors other than pain, including hearsay, the child’s temperament and parental reactions. Some were uncertain about strategies that could prevent fear from developing. Only one mother described treating pain to prevent the development of fear. One participant described greater difficulties dealing with the pain experienced by her child, which resulted in her delaying her child’s immunization. Others noted that their children did not want to go for their regular check-up because they did not want to get their shots.

### Immunization pain management

All of the participants used nonpharmacological techniques to manage immunization pain, such as distraction, reward, breastfeeding or holding their children. Most were unaware of topical anesthetics. Barriers to the use of analgesics included the following: perceptions that the pain was minimal and should be endured, inability to assess pain and concerns about medication side effects.

One participant noted that “you can usually deal with [pain] in other ways...either ignoring it or relaxing with it” (participant #7). Approximately one-half of the participants described difficulties assessing pain in their younger children and infants, and, consequently, did not use pain medication. For example, one participant said, “I feel I can’t judge really. I’m not there to judge, you know I can’t tell exactly if it’s pain...I’m not going to give it [medication] just for the sake of giving it” (participant #5).

The pain in immunization was contrasted with fever, which participants were better able to detect and, therefore, more likely to treat pharmacologically. Participants commented that the age of their child might influence how they manage pain due to the presence of more pronounced, fearful reactions: “I may change my thoughts, seeing my son now that he’s older, and his reactions to injections, because I know he’ll become more dramatic and they can get more scared. But in the zero- to 18-month range, I wouldn’t change what I give” (participant #13).

Participants were concerned about over-medicating their children. Although participants generally believed that

nonprescription oral analgesics (such as acetaminophen) were safe, they had concerns about their children developing dependency and tolerance to medications: “If they think it’s [medication] going to relieve every pain they get, it’s going to be something they want all the time...and then after a while it doesn’t even work anymore because they’ve taken it too much” (participant #10).

Participants explained that they used medication only when nonpharmacological methods were ineffective and it was “necessary”. The medications used were acetaminophen and ibuprofen; however, they were used most frequently for prophylaxis and treatment of fever rather than pain.

Twelve participants had never heard of topical anesthetics. One participant used a topical anesthetic for her child during immunization and described potential logistical barriers: “When I go to my doctor, there is a pharmacy there. Well if I go and get it then, it’s not really enough time for it to work...” (participant #5).

Some participants believed that topical anesthetics have advantages over oral analgesics because they target the affected area rather than the whole body and would be easier to administer. Most participants did not perceive difficulties incorporating topical anesthetics into their routine.

### Physicians as sources of information

Participants identified their children’s physicians as the most trusted source of information and looked to them for guidance on pain management during immunization, and in particular, for information about when medication is necessary and for their knowledge on its effectiveness. One participant described her perception of her paediatrician’s reaction if she were to inquire about pain medication, laughingly noting that he would “call me a wimp” (participant #4). Another participant felt that since her physician had not recommended a topical anesthetic, it was probably not justified: “My doctor has never used [a topical anesthetic] on her, so I guess he doesn’t believe. And he’s Head of Paediatrics at one of the hospitals, so I kind of feel, you know, confident that he knows what he’s doing and if he doesn’t use these things that he has his reasoning behind it” (participant #1). Mothers used various sources of information to learn about pain management strategies, including popular media (Internet and news), friends, colleagues and family. However, they brought the information from these sources to their doctor for further discussion and advice.

All but one of the participants wanted their physicians’ recommendations before using new pain medications such as topical anesthetics. The majority of the mothers said they would use a topical anesthetic in the future if it was safe and recommended by their physicians.

### DISCUSSION

The present study examined mothers’ conceptualization and management of pain in their children during routine immunization. All of the participants found the immunization experience to be distressing. They minimized their concern regarding pain by focusing on the benefits of

immunization and dismissing the pain as short lived and needing to be endured. Participants reported the use of non-pharmacological analgesic techniques, such as distraction, to comfort their children. When medications were used, it was usually oral analgesics to prevent or treat vaccine fevers occurring after immunization. Participants were largely unaware about topical anesthetics. They expressed a willingness to use them if endorsed by their physicians, who were identified as their main trusted source of pain management information.

These findings are consistent with our previous data (regarding pain management practices during immunization) that demonstrate a gap between evidence-based recommendations of topical anesthetics and current practices (6). These findings also reflect the broader literature on pain management that addresses the role of societal attitudes in the under-treatment of pain (10) such as the relative unimportance given to pain compared with other ailments (such as fever) (11,12), views about pain as a necessary part of life experience, the notion that pain is a part of immunization and a short-lived experience, and concerns about over-medication with analgesics leading to tolerance or addiction (13,14).

Previous research has shown that the rate of vaccination deferral is associated with the number of vaccine injections due to be administered at a visit (15,16). Interestingly, some participants in the present study attributed pain to fear rather than the other way around. Fear occurs if a child assesses a situation as threatening and, with respect to needles, develops primarily through negative memories formed during past experiences with needles (17). Fear can magnify the pain experienced by children during subsequent immunizations.

All mothers reported using nonpharmacological methods to reduce pain during their children's immunizations. Psychological interventions such as distraction are effective in reducing immunization pain; however, they depend on the ability of adults to effectively engage a child's attention (18). Parental interventions can attenuate child pain and distress; however, parents do not reliably use them, and previous training is recommended.

While these findings might seem intuitive, they point to the need to critically re-examine and question the current assumptions and practices. Pain relief is considered a 'basic human right' (19), and the fundamental principle of responsible medical care is to 'first do no harm' (20). Given the solid evidence base for the effectiveness and safety of topical anesthetics in children (5), there is clearly a need to study whether parents, health care practitioners and policy-makers are participating in a social construction of pain management, and whether children would benefit from a critical reflection and analysis of this issue. As noted in the introduction, there are a range of factors that affect whether change occurs (and the extent of change) in health care (7). In previous studies (6,21), we have documented that parents are capable of administering topical anesthetics in their children and are willing to pay for analgesics to reduce

immunization pain in their children. Parents are willing to pay more than the actual cost of topical anesthetics (approximately \$5 to \$8 per dose). On the other hand, according to our findings, using topical anesthetics is not compatible with prevailing norms and values. For example, participants' physicians did not provide information about their use and there is a prevailing value of accepting and enduring the 'short-term' pain of immunization. There is also a lack of knowledge about topical anesthetics and they are not discussed during the physician visit. The present article is an initial step toward examining attitudes and practices, and how interventions can be developed to enable the use of evidence-based practices that minimize pain and the resulting implications.

Because physicians were identified as trusted sources of information, strategies are needed to support them as pain management educators. Qualitative studies are currently being conducted with health care professionals (including paediatricians, family practice physicians, clinic nurses and public health nurses) performing vaccine injections to provide insight into their attitudes toward pain and preferred education strategies and resources that would enable them to educate their patients and families and support evidence-based pain management practice changes.

The qualitative methods used allowed an in-depth exploration of participants' opinions, which has not previously been done. Credibility of findings was improved by the use of multiple coders, checking emergent codes with participants in subsequent interviews, and validation of interviews by content and method experts. The number of interviews is indicative of the time-intensive nature of qualitative research, and the achievement of saturation of key themes suggests that the number of interviews was sufficient. It is possible that the timing of the interview – during the women's stay at hospital following the birth of their baby – might have affected the findings, but the consistency of the findings with other research minimizes this concern.

The findings are limited to a sample of women located in a downtown hospital. We do not know how the results would compare for women living in a rural or remote setting, as well as for fathers. Many fathers accompany their children to immunization appointments and they may have attitudes that are different from mothers. We chose to initially investigate mothers due to our experience with mothers as the primary caregivers involved in immunization appointments. In many regions of Canada, physicians, particularly paediatricians, play a minor or no role in the administration of routine vaccines provided through publicly funded programs. It will be important to conduct additional studies to examine attitudes toward and practices regarding pain management during immunization with different groups and within the context of different health care and geographical settings.

## CONCLUSION

The present qualitative study demonstrated that the mothers interviewed developed various strategies to deal with

the pain experienced by their children during routine immunization, including justifying the pain experienced and using nonpharmacological approaches to pain management. They are not familiar with pharmacological approaches. The findings demonstrate the need for knowledge translation activities to engage mothers and other caregivers as well as health care providers in a reflection about pain experienced and its potential long-term effects, as well as in a dialogue about the evidence concerning pain during immunization.

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