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Pediatric Pain Management: Exploring the Roles of Medical Staff and Families

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Abstract **Review Article**

Pediatric pain is a significant medical problem that can affect children, their families, and healthcare professionals. It may arise from medical disorders such as surgical procedures, accidents, and other causes. The objective of this study was to examine the current literature on advancements in pediatric pain treatment and investigate the responsibilities of healthcare professionals and families in the management of pediatric pain. The researchers conducted a comprehensive search using prominent research engines such as Google Scholar, Science Direct, and PubMed. The researchers in this study conducted a comprehensive review of the relevant published literature and subsequently provided a concise summary of their findings. The findings of this study have substantiated that pediatric pain is a significant health issue that necessitates genuine and appropriate care. Nevertheless, the research has shown the emergence of many instruments that can be utilized to assess the degree of pain and effectively address it. Collectively, families play crucial roles in the administration of pediatric pain, which complements the responsibilities of medical personnel.

Keywords: Pediatric, pain, management, families, medical staff.

1. INTRODUCTION

The present study discussed the management of pediatric pain from various perspectives and makes a focus on the roles of medical staff and families in managing pediatric pain.

2. An Overview of Pediatric Pain

Pediatrics is the field of study that focuses on children from birth to age eighteen, considering their developmental variations (Mahmood, 2016; Rede and Goshu, 2024). Pediatric patients who are admitted to the hospital often suffer from pain, which can be caused by several factors such as illness, injury, or surgical interventions (Kahsay, 2017; Zieliński *et al.*, 2020).

For kids, physical suffering can be especially excruciating and irritating. Still, it gets very little attention, especially in low- and middle-income nations (Tagele *et al.*, 2023).

A child's pain is a significant health concern that can negatively impact numerous facets of life, such as academic performance, emotional state, physical capabilities, and social interactions (Rabbitts *et al.*, 2016; Lalloo *et al.*, 2023).

Shocking incidents such as sports injuries, fires, and automobile collisions, in addition to medical conditions like juvenile idiopathic arthritis and sickle cell crises, can all induce excruciating pain in children. Acute distress in children can also ensue from medical procedures, including but not limited to blood draws and vaccinations (Gai *et al.*, 2020). Symptoms of chronic pain in children may include musculoskeletal pain, migraines, neuropathic pain, and stomachaches (King *et al.*, 2011). Chronic pain affects 20% of children and adolescents in Canada; individuals of African descent, Indigenous descent, and other racialized backgrounds are at a higher risk of developing this condition (Canadian Pain Task Force, 2021). Irrespective of the duration, medical expenses, and impairments caused by pain, the expeditious implementation of pain management strategies is crucial (Rabbitts *et al.*, 2016). Nevertheless, the duration of waiting periods for specialized pain management can frequently extend to years or even months (Palermo *et al.*, 2019). Hence, by the guidance provided by the Canadian Pain Task Force (2021), it is critical to incorporate the expertise of medical professionals from primary and secondary care facilities when managing pain in children (Lalloo *et al.*, 2023).

For treating pain in children, the "3-Ps" method, a multidisciplinary approach combining pharmacological, physical, and psychological techniques, is an appropriate therapeutic paradigm (Reid *et al.,* 2016). Sickle cell crises, post-operative chronic pain, and tribulations of the trigeminal nerve are among the most severe and irreparably injured pediatric conditions that are typically treated at specialized pain clinics. Community healthcare professionals (HCPs), nevertheless, oversee many cases. The task of effectively managing a wide range of symptoms and requirements within the community can occasionally give rise to complications associated with fragmented therapy and uncertainty regarding the routes patients can take to acquire pain management (Canadian Pain Task Force, 2019).

Among children, pain is the most unsettling and vexing sensation (Tagele *et al.,* 2023). Regrettably, it is given little focus, especially in nations with lower and intermediate incomes (Cohen *et al.,* 2018). Despite recent progress in the field, nurses' inadequate comprehension and hostile attitudes continue to pose substantial obstacles to effectively addressing children's pain (Alotaibi *et al.,* 2019). Nurses' values and beliefs significantly influence their approach to managing pain in children (Manworren, 2000). Insufficient pain control can lead to negative effects on multiple bodily systems, impair the physical and mental well-being of children, diminish healthcare results, decrease patient contentment, and prolong hospitalization periods (Mondol *et al.,* 2018). Furthermore, it exerts an impact on both the direct and indirect expenses associated with healthcare, especially in low- and middle-income nations (Tagele *et al.,* 2023).

Everyone recognizes that pain is a complicated, multidimensional, subjective sensation that can be difficult to diagnose, quantify, or treat, particularly in children and adolescents (James *et al.,* 2012). Pain is defined as an unpleasant sensory and emotional experience that is related to or simulates real or potential harm to body tissues. Infants and children are more vulnerable than adults to (WHO, 2022). Individuals may encounter it as a result of illness, normal duties, physical stress, or small wounds such as burns, bruises, and cuts. As a result, people seek medical attention regularly, with chronic pain estimated to affect 20% to 35% of the global population (King *et al.,* 2011).

Children often experience pain when receiving medical treatment (Taylor *et al.,* 2008). In Canadian hospitals, over 33% of children experience severe pain, and over 66% undergo a difficult operation every day (Campbell *et al.,* 2023). Despite the prevalence of pain in children, research indicates that pediatric hospitals do not adequately assess or treat this condition (Birnie *et al.,* 2014). The most effective ways to gauge a child's level of discomfort include collecting data from many sources, such as behavioral cues, and validated self-report measures (Von Baeyer, 2006). Nevertheless, it is worth noting that a significant portion of pain assessments in pediatric hospitals in Canada rely on unvalidated measures, such as vague behavioral scales or a simple checkbox to indicate whether a kid is experiencing pain or not (Stevens *et al.,* 2012). This makes one wonder how reliable it is to record a child's subjective pain perception.

Unmanaged pediatric pain has been associated with other unfavorable outcomes in addition to patient suffering (Oddson *et al.,* 2006), making the absence of sufficient pain evaluation concerning. Oddson *et al.,* (2006) found that children with pain had a lower quality of life, while Palermo (2000) found that it hinders their and their families' ability to go about their daily lives. Hence, medical professionals must use pain assessment methodologies supported by evidence to accurately detect and quantify pain in youth groups and suggest appropriate treatment modalities.

3. Management Approaches to Pain in Children

Because children experience pain for a variety of reasons, both physiological and psychological, a multimodal approach is necessary for their pain management (Yabeyu *et al.,* 2023). Not to mention that some toddlers just don't have the language skills to articulate how hurt they are. Because of the importance of each party's participation in alleviating the child's pain, a cautious approach involving the child, their parents, and healthcare providers is necessary (Pope *et al.,* 2017; Jairoun *et al.,* 2022). When it comes to alleviating pain, pharmaceutical and non-pharmacological approaches can both work. Acetaminophen, opioids, and nonsteroidal anti-inflammatory drugs (NSAIDs) are among the many pharmaceuticals used to treat this illness (Rosenblum *et al.,* 2008; Moore and Derry, 2013).

Community pharmacists, being highly accessible and knowledgeable medical practitioners, are sought out by a greater number of patients compared to other healthcare providers for pain treatment (Lalonde *et al.,* 2014; Tabeefar *et al.,* 2020). Through drug evaluation, provision of guidance, and dispensing of non-prescription analgesics, they provide vital assistance in the realm of managing pain in young individuals (Ogunyinka *et al.,* 2021).

4. Assessment of Pain Severity

To properly alleviate pain, a pharmacist must possess a comprehensive understanding of pain mechanisms, evaluation, and therapy. This is an essential element in providing healthcare of superior quality (Papastavrou *et al.,* 2014). Unfortunately, a lack of understanding might harm the results of patients (Tabeefar *et al.,* 2020). Research has shown that prolonged misdiagnosis and treatment of pain in children can lead to harmful consequences and unnecessary distress (Walther-Larsen *et al.,* 2017).

Pain is a distressing sensation that is both bodily and psychologically disagreeable and is caused by tissue damage (Raja *et al.*, 2020). Patients may experience three distinct degrees of pain after surgery: minimal, moderate, or severe. Pain levels of this nature necessitate medical attention (Batoz *et al.*, 2016; Zieliński *et al.*, 2020). The utility, reliability, and validity of various pediatric pain assessment approaches vary depending on the age groups and types of pain present (Bringuier *et al.*, 2021). Postoperative pain in pediatric patients can lead to a range of negative consequences, such as insomnia, despondency, reduced physical and mental functioning, chronic pain, and prolonged hospital stays (Batoz *et al.*, 2017).

The level of pain experienced by young patients after surgery is influenced by various factors, including the type of procedure, the surrounding environment, and other related factors (Vittinghoff *et al.*, 2018). Research has indicated that in Togo and Rwanda, where a considerable proportion of children experience intense pain, the management of post-operative pain in pediatric surgery is frequently insufficient (Kalala *et al.*, 2021). Postoperative discomfort is associated with preoperative worry, previous preoperative pain, the type of operation, and the size of the incision (Mekonnen *et al.*, 2021).

To ascertain the factors that contribute to postoperative pain in children and quantify its severity, a study was undertaken by Rede and Goshu (2024). The results showed that patients experienced moderate to severe pain in 36.6% of cases 12 hours, 20% of cases 24 hours, and 10% of cases 36 hours after surgery. Patients who experienced preoperative discomfort and anxiety had a greater likelihood of experiencing moderate to severe pain after surgery (adjusted odds ratio [AOR]=3.41, confidence interval [CI]=1.15,10.00; AOR=2.28, CI=1.219,4.277, respectively). The duration and nature of the operation were intraoperative predictors of postoperative pain intensity. More specifically, an extended duration of surgical attendance was associated with a 6.62-fold rise in the probability of experiencing intense pain (interval of confidence: 1.90–23.00); conversely, major surgery was linked to a 5.2-fold increase in the likelihood (95% confidence interval: 2.11–12.88). Patients who were administered multimodal analgesics experienced a substantial reduction in the intensity of postoperative pain (Adjusted Odds Ratio [AOR]=0.24; Confidence Interval [CI]=0.091, 0.652). Moreover, patients who underwent frequent assessments during the postoperative period experienced a significant reduction in pain intensity (AOR=0.09; CI=0.022, 0.393). Taken together, A considerable proportion of pediatric surgical patients who participated in this study reported experiencing intense pain after the surgery, especially during the initial twenty-four hours. The assessment methods and strategies for managing postoperative pain had the most significant impact on the degree of pain.

According to Bucknall (2000), a critical care nurse is required to make 1428 judgments during a 12-hour shift. Each of these options has the potential to ultimately impact the requirements of the patient and their family (Johansen and O'Brien, 2016). The process of clinical decision-making is intricate and is affected by various aspects such as patient assessment, the culture of the nursing unit, context, experience, intuition, and patient knowledge (Nibbelink and Brewer, 2018). Furthermore, this procedure grows increasingly intricate as the patient count increases, their condition improves, and more sophisticated medical apparatus is employed (Nibbelink and Brewer, 2018).

Pediatric intensive care unit (PICU) nurses operate within a clinical setting characterized by high-stakes circumstances. In such situations, a nurse is responsible for possessing a comprehensive understanding of severe illnesses, developmental disparities related to age, and the functioning of sophisticated medical devices, such as mechanical ventilation (Ismail, 2016). Avila-Alzate *et al.*, (2020) found that PICU nurses frequently assume responsibility for ensuring that their patients receive the necessary sedative and analgesic medicines to maintain comfort and support medical therapy.

Both inadequate and excessive administration of anesthesia can have adverse consequences on children, including unintended removal of the breathing tube or failure to remove the breathing tube (Vet *et al.*, 2013). Insufficient pain management in children can lead to a range of biopsychosocial consequences, both in the short and long term (Gerik, 2005). Pain has short-term effects on the body, including increased physiological demands such as higher heart rate, blood pressure, cardiac oxygen consumption, slower healing, and a compromised immune system (Olmstead *et al.*, 2010). These adverse effects may lead to an extended hospitalization. Prolonged mishandling of pain has been associated with the development of conditioned anxiety responses, decreased frequency of medical visits, and post-traumatic stress disorder (Haraldstad *et al.*, 2017).

Differentiating between agitation and pain is of utmost significance because each condition necessitates an alternative approach to treatment (Harris *et al.*, 2016). Frequent instruments utilized in the PICU are the Face, Legs, Activity, Cry, and Consolability (FLACC) for pain assessment and the State Behavioral Scale (SBS) for sedation (Laures *et al.*, 2019). Nevertheless, due to the overlapping nature of behavioral indicators across multiple scales, nurses may potentially experience confusion regarding the scales. A 2019 study by Laures *et al.*, found that the SBS was utilized to evaluate pain in children admitted to the Pediatric Intensive Care Unit (PICU) as opposed to sedation. In certain cases, there may be a need to supplement anesthetics and sedatives with neuromuscular blocking medications when managing critical and life-threatening medical

conditions in children. Chemical paralysis, which occurs in children undergoing neuromuscular blockade (NMB), has been demonstrated to be beneficial in conjunction with mechanical ventilation (Chandra *et al.*, 2020). The children in question lack a reliable tool, such as an assessment scale, to quantify their degree of distress or sedation (Harris *et al.*, 2016; Smith *et al.*, 2022). As a result, they are especially susceptible to unsuitable treatment and the adverse consequences that ensue. Pediatric guidelines and recommendations are accessible to all children in the PICU, including those who need NMB, to facilitate appropriate pain management (Harris *et al.*, 2016; Herr *et al.*, 2019; Smith *et al.*, 2022). However, it remains uncertain whether nurses incorporate these suggestions into their routine practice.

5. CONCLUSIONS

Pediatric pain is a serious issue facing healthcare providers and families. The management of pediatric pain requires cooperation between different parties including medical staff such as nurses and pediatrics as well as families. Some instruments to assess pain have been proposed to be implemented in clinical practice.

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