

A Critical Investigation of the Role of Psychological Pain Management on Successful Paediatric Physiotherapy and Rehabilitation

Type: Literature Review

Received: June 01, 2023

Published: June 09, 2023

Citation:

Amani Abdulla Mohammed Al Ali. "A Critical Investigation of the Role of Psychological Pain Management on Successful Paediatric Physiotherapy and Rehabilitation". PriMera Scientific Surgical Research and Practice 2.1 (2023): 06-14.

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Abstract

Physical pain in children has been identified by multiple evidences of research as a source of discomfort among children that can even limit their reception of other medical treatment. In this study, effort is made to highlight the role of physiotherapy in psychological pain management in children and how it helps in improving pain management for better treatment and rehabilitation.

The current study examined evidences of literature from over 30 authoritative sources made up mostly of authoritative journals in the medical field of physiotherapy with specific focus on paediatric physiotherapy. The research sought to extract evidence of the different needs of children when it comes to pain management and how physiotherapy practice can be effectively deployed in the management of pain among children both from a psychological and physical point of view.

The findings of the research highlighted the important role that physiotherapy with specific focus on psychological capabilities of physiotherapist to identify pain in children and effectively manage it. This was noted to assist children in their rehabilitation process post injury including but not limited to the positive uptake of other treatment such as surgery.

Keywords: physiotherapy; psychology; paediatric physiotherapy

Introduction

Today, most people are likely to seek medical attention from health care professionals if in pain, for different reasons. However, for a majority, pain experience is as a result of non-traumatic causes. In the last decade, pain therapy has gained increased attention, and in many circumstances the treatment of pain has been far-reaching. That said, proper pain management with the correct application of guidelines and protocols are likely to lead to improvement in pain treatment outcomes in the shortest time (Kürtüncü et al., 2019). Thus, the experience of pain can have many forms ranging from psychological, emotional and physical proportions. By definition, the International Association for the Study of Pain (IASP) classifies pain as an emotional experience that may directly or indirectly correlate with a person's previous experiences in a section of the body that may be linked to tissue

damage. Additionally, pain assessment can be challenging given that the experience differs from person-to-person, each having a unique emotional and sensory experience (Cohen, 2008). In addition to multiple repercussions that have an impact on a child's academic performance and quality of life, pain may be connected to a life-threatening event (Mitchell, 2016).

As a physical therapist practicing in the field of paediatrics, being able to get rid of pain in children remains one of the core responsibilities. Hence, the role of physiotherapists and nurses in the management and evaluation of pain in children is vital. This is true as physical therapists in their profession spend more time providing and giving care to children (Jibb et al., 2015). As health care professionals, it is important to note that the ability to assess and manage pain is a key aspect of patient care and treatment. Further, it is worth noting that pain management and assessment is an area of interest in academic research and postgraduate studies (Stewart, 2015) (Kürtüncü et al., 2019). For people with advanced chronic disorders, pain can result from much further devastating and terrible symptoms arising from underlying conditions. The likelihood for paediatric patients to be hospitalised for pain treatment compared to adults could be higher, converse to the misconception that they are less likely to suffer from pain and their recollection of painful experiences is either absent or partial (Gerik, 2005). Despite the initial diagnosis, there's a higher chance that the quality of life for patients can be negatively impacted. And, if the pain management is poor, then that could lead to adverse effects on the patient, the family and its occupants, as that could mean increased hospitalisation rates, which could be detrimental (Walters, 2009).

Pain that is uncontrollable can have a direct impact on one's health state and even affect other areas of life. In order to manage pain effectively, the ability to comprehend the paediatric, cognitive and emotional components associated with pain, in a paediatric patient can be of great importance to pain assessment and simplifying pain management practices (Nair, 2013). Hence, left untreated, pain could have a negative impact that can lead to sensitivity, impacted immune performance, and other neurophysiological disorders such as attitudes, and health care behavior that are supported by available evidence. It is the responsibility of child care professionals to provide counsel and give pain-relieving advice to alleviate suffering where necessary (Nair, 2013). Taking into account the introduction and the correlation between pain and the quality of life required for children and acknowledging the importance of the cognitive/psychological grasp of paediatric pain among physiotherapists, the current research will critically investigate the role of psychological/cognitive pain management among children and how this helps in pain management during musculoskeletal injuries.

Review of Literature

Over the past decade great strides have been made in the practice of the Child Pain Relief Protocol that has seen the development and validation of the pain and pest validation tools for paediatric patients. Even better, the majority of children's hospitals today have dedicated pain services aimed at providing immediate assessment and treatment of pain for children (Canbulat N, 2012). At a certain age, it becomes difficult to assess and treat pain relatively for adults. But in the case of children, the inability to detect pain and lacking the clarity in remembering painful experiences among other reasons reflects the mythical thoughts regarding a child's ability to perceive pain (Chiaretti A, 2013). Regardless, the treatment of childhood pain is similar to that of adult management practice which includes interventions that are pharmacological and non-pharmacological in nature. Then again, an in-depth understanding of both developmental and environmental factors that influence pain-causing treatment, pain perception and response is key to treatment during maturity from childhood to adolescence (Zhu LM, 2012). Different countries based on their respective health institutions show variations in the practice of assessing and managing pain in paediatric patients. Therefore, the current review focused on contemporary practice and new developments in the assessment and management of children's pain, with much importance being placed on the psychological approach by physiotherapists.

Several classification systems used to explain the different types of pain exist (Mcpherson ML, 2004) (Kahsay, 2017). Mcpherson (2004) notes that physical therapy is among the vital scientific disciplines in the field of patient care and rehabilitation where through practice and daily tasks from personal life-related experiences he gets to broaden his knowledge in the field. Physiotherapy is important to the medical care program as it plays a major role in the maintenance of an individual's health as well as the societal fabric. Hence, physical therapy has become a much sought-after medical treatment and has recently increased in importance as a result of its diverse needs and specialities that it covers, and as a result, physiotherapy has become integral in the treatment of bone-related dis-

eases and other neurological diseases. In other aspects such as patients seeking surgery, physiotherapy today plays a significant role in their mental and physical state, and is also applied in the rehabilitation process after surgery (Kahsay, 2017). In physical therapy and rehabilitation, numerous physical techniques are employed including, thermal factors, electrotherapy, which also include therapeutic exercises, behavioural therapy, alone or in combination with interventional techniques, and traditional drug therapy for pain usually as part of a multidisciplinary program (Geertzen, 2006). It is recommended by the Centres for Disease Control (CDC) that physical therapy and exercise be prescribed as a positive alternative to opioids in order to reduce a person's pain during injuries and illnesses. Specific examples include: chronic lower back pain, hip and knee arthritis, and fibromyalgia. That said, the idea of exercising on its own, or in combination with other rehabilitation methods (such as psychological approaches) can have a positive impact on pain relief. Additionally, exercise alone can also improve an individual's general condition and health status (Roger, 2016).

Despite the above being true, in the majority of cases children are more likely to experience severe pain in their musculoskeletal system, and to an extent, this affects the quality of life and impedes cooperation during health care procedures. In general, children remain at high risk in terms of pain, compared to the general population with the reason being the frequent occurrence of stomach, muscle and bone-related problems, including during surgical and procedural interventions. As a result, the above risk factors may compound their pain when receiving the recommended actions during physical therapy. Despite the introduction of pain tools developed for use in hospitals settings to assess children's pain and distress responses to acute and procedural interventions, few exist that could help assess responses to less invasive procedures. The foregoing notwithstanding, in the current research, the application, validity and reliability of the assessment tools were not explored during real-time PT interventions. Hence, the research led by the physical therapist about interventions to treat pain in this population was limited, despite evidence of widespread pain and increased research supporting the use of pain management using the application of physiotherapy for children and its ability to manage conditions affecting the musculoskeletal system.

From an experiential viewpoint, it brings much inconvenience to all, seeing a child suffer and it is much worse for the mother and father watching their child unable to move and they are not able to help them walk or have them take charge of their own needs without assistance. In such cases, doctors and physiotherapists too remain helpless and equally stressed as they are tasked with the struggle of ensuring the ailing and hurting child resumes normal life. In these instances, it is difficult for parents as they are unable to bear when the child is in pain or seeing that their child is incapable of interacting with other children in play and running, and here the problem of research lies in the importance of physical therapy for children, because in the process of restoring a child's normal state, then the parents are able to smile again as nothing gives joy to a parent than seeing a child in their healthy, playful state.

Physical therapists, sometimes referred to as dots, play a key role in assisting the injured or sick patients to improve their movement and even manage their pain. In essence, these therapists are often an important part of rehabilitation treatment and prevention for patients suffering from chronic diseases or injuries, and in their practice they ensure to master the needed skills in order to practice effective physical therapy on children. Therefore, this paper seeks to provide a contemporary outlook on physiotherapy for children in the form of guidance on why physiotherapy is critical in the process of treatment for children. The thesis of the paper is that there is a need for a psychological approach to the treatment of pain in children in order to support them through other treatment procedures and accelerate their recovery and resumption to normal life. As discussed earlier, pain has the capacity to impede the treatment process and in this case, the current study hypothesises only one successful approach to managing pain during treatment: the use of psychology to understand the sense of pain from the child's perspective in order to effectively deploy their physiotherapeutic skills in order to relieve it.

The International Association for the Study of Pain (IASP) defines pain as, "an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage." In the Physiotherapy guide, pain is defined as a feeling of discomfort causing distress or suffering" (Terman, 2001). From both definitions, it is evident that pain in a patient is a subjective experience. In the event that there is repeated pain or prolonged exposure to pain may lead to a marked change in responses to future painful stimuli (referred to as hyperactivity) and it may even result in non-painful stimuli (referred to as allodynia) (McGrath P, 2001). Traumatic events related to pain experience may be as a result of several factors which include, cognitive and emotional development,

chronological age, gender, coping skills, underlying conditions, and cultural surroundings. In the same vein, the response by a child to painful and stressful events might not be stable and thus it is often important that it is adjusted by a knowledgeable adult (Swiggum, Hamilton, Gleeson, & Roddey, 2010). Pain is thought of as the fifth vital sign and it is important to have it recorded and evaluated as other vital signs. In order to have appropriate pain intervention there's a need to have a plan based on accurate pain assessment (Kahsay, 2017). Hence, organised and routine pain assessment through the application of standardised and validated measures is recognised as a cornerstone for effective pain management in patients, and is unrelated to age or other underlying conditions (Minister of Health, 2016). Recent findings show that the concept of pain in children has broadened as it was shown that newborns had non-encapsulated nerves that may convey nerve signals, whereas adults have slower ones. Newborns lack a completely developed nerve connection between their brain and spinal cord, which gives children's neurological systems the ability to lessen the proportion. According to a Brazilian study, improving pain management in paediatric critical care units requires constant achievement of pain assessment using conventional criteria, such as the degree of face, legs, activity, crying, tolerance, and other physical characteristics (Dantas L, 2016).

Individual self-reporting is the best and most preferred method for measuring pain because in itself, pain is a subjective experience. However, in situations where a reliable self-report is not available, such as in children who are unable to communicate because of their age or developmental stage, observational and behavioural methods and assessment tools are suitable replacements (Kahsay, 2017). Since other vital signs and results are adequately documented, pain evaluation should be done frequently for the convenience of the entire healthcare team (American Pain Society, 2012). The most accurate indicator of pain is the patient's self-definition because it is a subjective experience. In order to determine the origin of pain and choose the most effective treatment options, it is essential to collect a history of pain directly from the patient whenever possible. Alternative methods should be employed to ascertain the characteristics of pain when the patient is unable to express verbally. The patient should also be questioned regarding any aggravating or mitigating variables. Doctors should attempt to demonstrate whether the pain is co-ordination, multifocal, or generalised because pain is frequently felt in multiple locations. Additionally, pain—typically abdominal pain—can be indicated. The patient's perception of the pain is indicated by its quality, which frequently hints at the pathophysiology of pain. In most cases, soft tissue and bone injury is what causes this kind of discomfort. Visceral nociceptive pain is typically diffused pain that is described as squeezing, cramping, or swallowing (Perger AM, 2002). Choosing the right pain assessment methods for children should take age, cognitive level, final disability (Solodiuk, 2003), type of pain, and situation in which the pain arises into account, even though it is simple to assess pain symptoms in adults. Therefore, healthcare personnel should be trained in the use of pain assessment methods and be aware of their limits (Wong C, 2012).

Methods

The primary goal of the research methodology, which is a methodological approach, is to discover solutions to all research questions and provide successful outcomes for a particular study (Creswell, 2008). For this research study, a descriptive approach was used in order to meet the goals and objectives of the paper. An integrated evaluation of the literature was undertaken as part of the research, which involved looking at several pertinent books, journals, magazines, theses from universities, relevant international references, and peer-reviewed scientific papers.

The purpose of this study was to assess academic postgraduate programs in paediatric physical therapy and pain management. Accordingly, an in-depth examination of extant literature around the subject of physiotherapeutic pain management in children and the role of psychology in it was done. Combinations of the words "pain," "children," "physical therapy," "musculoskeletal," "pain evaluation," and "pain tools" were among the search phrases utilised. As required, additional manual searches were carried out. Articles specifically discussing how paediatric physical therapy interventions affect the musculoskeletal system were also included.

The research focused its search efforts in renowned databases in order to collect the most valuable evidences in the field of study and use them in the development of the critical review. Some of the databases accessed during the conduct of the search for relevant literature included - PubMed, Google Scholar, Science Direct and Ebscohost among others. Table 1 below presents the studies that were closely consulted in the development of this critical review:

Author(s)	Year	Title and details
Akesson, K. D.	2003	Improved education in musculoskeletal conditions is necessary for all doctors. Bull World Health Organ 2003, 81:677-683.
American Pain Society.	2012	Treatment of Pain at the End of Life. Available at www.ampainsoc.org Accessed on 21 April 2012.
Celedon, X., Amari, A., Ward, C., Prestwich, S., & Slifer, K.	2014	Children and adolescents with chronic pain and functional disability: Use of a behavioral rehabilitation approach. Curr. Phys. Med. Rehabil. Rep, 2,86–92.
Chiaretti A, P. F.	2013	Current practice and recent advances in pediatric pain management. Eur Rev Med Pharmacol Sci ; 17: 112- 126.
Clinch, J., & Eccleston, C.	2009	Chronic musculoskeletal pain in children: Assessment and management. Rheumatology (Oxford) 2009, 48, 466–474.
Cohen, K. L.	2008	Evidence-based assessment of pediatric pain.”, J Pediatr Psychol, vol.33, no.9, pp. 939–55, 2008.
Fisher, E., Heathcote, L., Palermo, T., Williams, A., Lau, J., & Eccleston, C.	2014	Systematic review and meta-analysis of psychological therapies for children with chronic pain. J. Pediatr. Psychol. 39, 763–782.
Freedman, K., & Bernstein, J.	1998	The adequacy of medical school education in musculoskeletal medicine. J one Joint Surg Am, 80:1421-1427.
Gerik, S.	2005	Pain management in children: Developmental considerations and mind-body therapies. South Med J; 98: 295-301.
Harrison, L., Pate, J., & Richardson, P.	2019	Best-Evidence for the Rehabilitation of Chronic Pain Part 1: Pediatric Pain.
Kahsay, H.	2017	Assessment and treatment of pain in pediatric patients. Department of Pharmacy, Collage of Health Science, Adigrat University, Adigrat, Ethiopia. Curr Pediatr Res; 21 (1): 148-157.
Kemani, M., Kanstrup, M., Jordan, A., Caes, L., & Gauntlett-Gilbert, J.	2017	Evaluation of an intensive interdisciplinary pain treatment based on acceptance and commitment therapy for adolescents with chronic pain and their parents: A nonrandomized clinical trial. J. Pediatr. Psychol. 2018, 43, 981–994.

Table 1: Some of the consulted studies.

Findings

Research through the review of extant literature noted that, tools for measuring pain fall into a number of areas, including self-report, physiological, behavioural, and distress assessments.

Self-determination measures

Metrics for self-reporting might be verbal, like structured interviews, questionnaires, metrics for self-evaluation, and descriptive descriptions of pain, or non-verbal, like charts showing facial expressions and graphics. Location, severity, duration, quality, emotional responses, environmental circumstances that exacerbate pain, and pain-related disability are all features of pain that can be evaluated through self-report. Metrics come in many forms. The most reliable method for assessing pain is self-report. However, limitations on children's self-determination actions were found. These include the following: (1) a need for adequate cognitive and linguistic development; (2) the possibility that children may construct an answer due to a lack of understanding; (3) the tendency of children under the age of five to treat scales as dichotomous and not gradual, and to only select maximum limits; and (4) the possibility that children's

reports of pain may be influenced by their perception of the results of evaluation. A thorough examination of the child, the type of pain, and the accessibility and applicability of the various pain measures are all necessary for an accurate pain evaluation in children.

Behavioural measures

The children's face coding system, the behavioural pain assessment scale for the face and legs, activity, crying, and tolerance are examples of frequently employed behavioural evaluation instruments.

Physiological measures

Assessment of pain reactions can be done using physiological indicators such as vaginal tone, blood pressure, heart rate, oxygen saturation, neuroendocrine response, and palmar perspiration. The following are some difficulties with the interpretation of these measurements alone in the case of children: (1) Physiological reactions to chronic pain appear to become accustomed to; (2) age, drugs, public health, and environmental factors may influence the response.

(3) different forms of stress elicit similar physiological reactions.

Discussion

To determine which patients require intervention and to evaluate the efficacy of the intervention, credible and reliable pain assessments are required. In the literature on pain, the terms "evaluation" and "measuring" are frequently used and distinguished in the ways listed below. Measurement is the process of giving something a number or value, and it typically has to do with how far away the pain is. On the other hand, the evaluation outlines a more involved procedure in which quantitative values are taken into account with information concerning pain, its significance, and its effects on an individual (Johnston, 1998). Examining a patient has three parts in physiotherapy practice: reviewing systems, using tests and procedures, and reviewing the patient's history. The process of gathering data from an examination in order to determine a diagnostic, diagnosis, and care plan is described by the term "evaluation" in physical therapy (McGrath PJ, 1999).

The evaluation and assessment of pain are crucial components of the physiotherapy profession. During the initial examination of a patient, 24 types of measurements and tests are conducted during the diagnosis of a patient. The Physiotherapy Practice Manual also suggests assessing the type and degree of pain, as well as its physical and temporal aspects, reflecting the multifaceted and intricate nature of this phenomenon. Although the same general principles for assessing and examining pain apply to everyone, children and infants present some special challenges that call for taking into account the child's age, stage of development, communication and cognitive skills, prior pain experiences, and associated concerns and beliefs (O'Rourke, 2004). The musculoskeletal system, which includes the body's bones (which make up the skeleton), tendons, muscles, joints, ligaments, connective tissues and cartilage, gives the human body shape, stability, and mobility. The tissue that supports and ties tissues and organs together is referred to as connective tissue. Elastic fibres consisting of various proteins, such as collagen, are two of the key constituents of connective tissue. About 25% of patient complaints in the hospital setting are musculoskeletal problems (Pinney, 2001). However, research has shown that some doctors lack strong confidence in their ability to assess, examine, and treat patients (Saywell RMJ, 2002).

Nearly half of American medical schools still do not require any formal training in musculoskeletal medicine, despite the fact that a lack of concentration in medical school curricula has been frequently implicated (Bernstein, 2003). Formal evaluations of musculoskeletal medicine knowledge and less-than-ideal treatment patterns for patients with bone and muscle problems demonstrate this serious lack of confidence in poor performance (DiCaprio, 2003). According to Matzkin and others, residents and medical students have similar degrees of high knowledge of musculoskeletal medicine. They discovered that experienced doctors from a variety of fields lacked adequate knowledge of musculoskeletal medicine, with the exception of orthopaedic specialists (Matzkin, 2005). During the first week of their post-medical training phase, 85 physicians participated in a study by Freedman and Bernstein that aimed to evaluate their knowledge in musculoskeletal medicine using a standardised test. The outcome was just under 60%, with just 18% of doctors scoring at or above the minimum required level of orthopaedic program managers to show competence in musculoskeletal medicine

when preparing primary care (Freedman & Bernstein, 1998). As a result, training in non-bone residency training programs and resident training programs in medical schools was usually inadequate (Akeson, 2003). The advantages of early access to physiotherapy services are therefore strongly supported by the data (Childs & Fritz JM, 2004). In instance, physiotherapists are increasingly offering their services directly to patients without a doctor's reference (i.e. direct access). 39 states have established laws enabling this kind of health care delivery after 70% of the general population stated they would use physiotherapy for musculoskeletal issues rather than referring patients to doctors (Snow, 2001).

Numerous recent studies have shown that physical therapists can treat patients with muscle and bone pain effectively, completely, and affordably without referring them to a specialist, which strongly supports the extension of physical therapy services. For instance, it is claimed that patient access to physical therapy from a doctor's reference increased costs by 123%, and office visits by 60%, while direct physiotherapy visits claims only 67% costs. Although the majority of musculoskeletal cases are the emphasis of the curriculum in physical therapy programs, there have been few studies examining physiotherapists' understanding of the abilities required and sufficient to manage patients without sending them to a doctor in a direct access setting. For this objective, a written musculoskeletal examination and validation of skeletal muscles has recently been devised (Freedman, KB; Bernstein, J.). This test was given to numerous trained physicians, medical students, residents, and specialists, making it a widely referenced benchmark for completing an initial assessment of sufficient expertise in treating a variety of muscle disorders. Structure between physical therapy students and qualified physiotherapists (Matzkin, 2005). As a result, the purpose of this study was to characterise the skills and role played by physical therapists in treating a variety of musculoskeletal diseases. These facts, along with those from clinical trials, show the advantages of physiotherapy for direct access, which may help to define the function of physical therapists in such settings (Childs, Whitman, Sizer, & Pugia, 2005).

Conclusion

Paediatrics is a field that focuses on diagnosing and treating paediatric ailments like cerebral palsy, developmental delays, and aberrant neck growth, all of which have been researched in this academic study. The use of physical and occupational therapy, psychosocial interventions, and pain education are just a few of the numerous approaches that have been shown to be effective in treating chronic child pain early and specifically (Clinch & Eccleston, 2009). Psychological treatments for children with chronic pain include coping with pain and impairment with the ultimate aim of restoring baseline functioning. The detection and treatment of negative perception, relaxation training, psychological education, parental training, behavioural exposure, acceptance exercises, and values education are a few examples of the elements of psychological therapies for chronic pain (Simons, L.E.; Basch, M.C., 2016). Strong evidence supports the effectiveness of these therapies in lowering mental illness, disability, and pain intensity (such as anxiety) in children with chronic pain. Psychological treatments have been found to lessen discomfort in the belly, head, muscles, and bones, as well as functional impairment in those disorders (Fisher, Heathcote, Palermo, Williams, Lau, & Eccleston, 2014). Children who experience chronic pain may benefit from rehabilitation and physiological treatments, such as occupational and physical therapy, which aim to enhance physical performance by encouraging self-management of pain and gradually reintroducing previously avoided activities (Celedon, Amari, Ward, Prestwich, & Slifer, 2014).

More flexibility, strength, joint stability, endurance, coordination, balance, tolerance for weightbearing, and initial aptitude are the goals of these interventions (Simons et al., 2018). Active interventions, like exercise, and return to work, returning to sports and schools, play a more important role than negative interventions, like stimulating or massaging the Transcutaneous Electric Nerve (TENS), because the goal of these treatments is to enhance independence and strengthen muscles and bones (i.e., sufficient ability to manage daily life well without requiring significant support from caregivers and parents) (Landry, et al., 2015). Instead of sufficiently treating pain, the majority of the goals of occupational and physical therapeutic therapies frequently center on autonomous performance, as well as increased self-efficacy and improved coping (Lynch-Jordan, Sil, Cunningham, Kashikar-Zuck, & Goldschneider, 2014). A therapeutic treatment plan was created and appropriately followed for the development of the individual following a social psychology evaluation that included an evaluation of functional goals (Kemani, Kanstrup, Jordan, Caes, & Gauntlett-Gilbert, 2018). Physical therapy for children has a variety of objectives, including immediate ones like pain relief and speeding up the healing process.

increasing range of motion, maintaining muscles and joints, and stimulating muscle and reducing flatulence. Boost and keep up your muscular strength. Balance is improved, as well as muscle tension, central nervous system inhibition, and stimulation. Improve blood circulation, kinetic synergy, walking, and the body's overall health. And long-term objectives include restoring the patient's health and motor function to their pre-injury levels, as well as lowering injury and functional issues. Encourage keeping a healthy weight and body composition to stave off specific illnesses or disabilities (Harrison, Pate, & Richardson, 2019).

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