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What Works When Treating Children and Adolescents With Low Back Pain?

Low back pain is a common health condition for all ages and responsible for significant individual, social, and economic burdens worldwide.¹⁸ One quarter to a third of children report persistent pain, including low back pain,⁵⁰ and up to 10% have some degree of disability.^{27,32,47} The years lived with disability due to low back pain increases with the age.¹⁶ Low back pain ranks sixth of all conditions for children aged 5 to 14 years and fourth for 10- to 24-year-olds.¹⁵ Point prevalence of low back pain among children and adolescents is 12%, lifetime prevalence is around 40%,²⁷ and annual incidence is approximately 15%.²⁷ Adolescents with persistent low back pain are about 4 times more likely to develop low back pain in

adulthood.²² Despite the link between low back pain in childhood and adulthood, there are important clinical differences between children and adults that have implications for diagnosis and management.

While low back pain is usually classified as nonspecific in adults (not

attributable to a recognizable specific pathology),¹⁸ identifiable anatomical causes for low back pain may be more common in children and adolescents.^{5,19} Scheuermann's disease (which can be associated with pain but more commonly presents as a permanent painless kyphosis of unknown etiology)⁵ and pars interarticularis stress fractures are prevalent in children and adolescents who present with low back pain.¹⁹ Other less common causes include seronegative spondyloarthropathies (eg, ankylosing spondylitis), intervertebral disc disease, tumors, and discitis. Identifying red flags, including night pain, weight loss, arthralgia (eg, heat, redness, edema), pain/stiffness in the morning, bony tenderness, and neurological signs and symptoms, is important to exclude serious spinal pathology in children and adolescents who present with low back pain.^{2,13} We do not address diagnosis and management of these specific pathologies in this Clinical Commentary.

Clinical Question: What Works for Children and Adolescents with Low Back Pain?

Children and adolescents have been overlooked in health research generally and back pain research specifically.³⁹ For a long time, low back pain in patients under 20 years of age was considered a red flag for serious spinal pathology.^{3,25,45} Research

• **BACKGROUND:** Low back pain is a common health condition for all ages. One quarter to a third of children report persistent pain, including low back pain.

• **CLINICAL QUESTION:** The aim of this Clinical Commentary is to provide an overview of evidence-based treatment approaches for children and adolescents with low back pain.

• **KEY RESULTS:** Physical, psychological, and pharmacological interventions are effective in reducing pain intensity and disability. Interdisciplinary and patient- and family-centered treatment approaches are the gold standard for persistent pain in children and adolescents. Communication between health professionals, children, and parents is a key part of a therapeutic alliance. The use of holistic and complementary therapies is not supported by compelling evidence.

• **CLINICAL APPLICATION:** Physical interventions can be delivered alone or as a component of other interventions. The interventions are delivered over 8 to 12 weeks. Psychological therapies are mostly delivered as a component of a multidisciplinary treatment program: cognitive behavioral therapy is most often used, and interventions usually run from 4 to 10 weeks. Pharmacological interventions should be delivered in combination with physical and psychological interventions. Tailor family-centered interventions to personal aspects, such as age, gender, and family structure. When communicating with children and adolescents, use simple language that is clear and direct. Aim to support trust between health professionals and parents to facilitate family decision making. *J Orthop Sports Phys Ther* 2022;52(7):419-424. Epub: 18 May 2022. doi:10.2519/jospt.2022.10768

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into treatment approaches in children is sparse, and guideline recommendations are based on research in adults.^{3,25,45} However, low back pain in children and adolescents has gained more attention recently.^{26,31,48} Children and adolescents may have different biopsychosocial factors that contribute to the development of low back pain than adults: childhood and adolescence is a period of maturation of the musculoskeletal system, hormonal changes, and growth in cognitive and emotional relationships. It is unclear how these affect the onset and natural history of low back pain.

Children and adolescents may respond differently to interventions (eg, due to ability to understand behavior change techniques, different adherence to active interventions, and different social-cultural context). Effective treatment approaches may be unique to this population. We aim to provide a clear and concise overview of the available evidence for clinical practice. We do not address issues such as certainty of evidence and effect size and recognize that some depth and nuance is lost in preparing this summary. Our goal is to provide a simple overview of evidence-based treatment approaches for low back pain in children and adolescents.

Physical Interventions

What Does the Evidence Say? Physical interventions are effective for treating low back pain in children and adolescents.^{12,27,30} Physical interventions may reduce pain and disability at posttreatment compared to usual or active medical care, but effect sizes are uncertain.¹² It is also uncertain whether effects are sustained.¹² Combined physical and educational interventions could be effective in reducing pain intensity compared to home exercises or no treatment.²⁷ However, systematic reviews about physical interventions are based on a few studies with high risk of bias and low to very low certainty of evidence.^{12,27,30}

Clinical Application Physical interventions focus on promoting independence, return to functioning, and improving self-

efficacy in children and adolescents.¹⁷ For this reason, physical interventions are recommended ahead of passive interventions (eg, massage, electrotherapy).^{17,28} There are a range of physical intervention options, such as general exercise, aerobics, yoga, stretching, strengthening, and hydrotherapy.⁵⁰ Physical interventions can be delivered alone or as a component of broader treatment approaches.⁵⁰ The mode of delivery, supervised or home program, does not seem to impact the size of the effect, but efforts to support adherence are likely important.^{30,50}

The best type of intervention will likely depend on patient preferences and the expertise of the therapist. Consider varying the settings (eg, in the gym, at home, with or without equipment, in public settings) to increase the exercise skills.¹⁷ Previous experience with the type of intervention and the patient's ongoing pain report during the intervention should be considered.^{31,42} Make playful and interactive interventions a priority, as adherence is likely to be low if patients find the intervention boring.⁵⁰ Recommendations for dose and duration are conflicting with tested interventions delivered 1 to 2 times per week, with session duration between 20 and 45 minutes for 8 to 12 weeks.³⁰ Graded exposure to activities through gradually increasing intensity can help promote behavioral management.^{9,17,21} Some caution is necessary regarding recommendations due to very low certainty of the evidence of effect.

Psychological Interventions

What Does the Evidence Say? Treatment approaches for persistent pain based on the biopsychosocial model are recommended.^{43,50} Psychological interventions that aim to support healthy thoughts, beliefs, or behavioral responses can have important benefits for children and adolescents with persistent pain.^{11,43,50} A recent systematic review showed that psychological interventions slightly reduce pain intensity compared to active medical care, usual care, or waiting list.¹² Psychological interventions may result

in a slight reduction of functional disability and increase global impression of change sustained over the long term.¹² There is moderate to very low certainty of evidence that psychological therapies should be used in clinical practice for children and adolescents.¹² Pain neuroscience education may be complementary to psychological interventions.⁴¹ Understanding pain mechanisms decreases its threat value and leads to more effective pain coping strategies, which can help children and adolescents with persistent pain to develop self-efficacy and self-management skills.¹⁷

Clinical Application Psychological therapies focus on self-managing pain and disability.¹⁷ They are mostly delivered as a component of a multidisciplinary treatment program, typically with physical interventions.^{10,17,35} Cognitive therapies (eg, hypnosis, stress management, coping skills) and behavioral therapies (eg, relaxation training, biofeedback, graded exposure) have been used for children and adolescents.^{11,35} Cognitive behavioral therapy (CBT), a combination of these 2 types of interventions, is commonly used to promote improvements in pain and catastrophizing in adolescents with persistent pain.^{17,20} Pain neuroscience education can provide children and parents clear explanations about the nature of pain, typical course, differences between acute and persistent pain, explanations of brain processing in pain, and the influence of psychosocial factors in the pain experience.^{17,41}

The choice of specific intervention will depend on patient preference and the experience of the health professional. The mode of delivery, face-to-face or remote, does not seem to have a strong influence.^{30,50} For CBT, the intervention may range in quantity and content of modules and total duration. Modules can include components such as exposure, graded activity, pain education, relaxation, and recognition of emotions.¹⁰ The duration of the intervention usually ranges from 4 to 10 weeks depending on scope of the content.¹⁰ Caution should be applied to

these recommendations due to the low certainty of the evidence of effectiveness and sparse evidence regarding adverse effects.

Pharmacological Interventions

What Does the Evidence Say? Pharmacological interventions are often delivered to children and adolescents with persistent pain.¹² However, current evidence suggests that pharmacological interventions should not be delivered as a stand-alone intervention.^{12,13} A recent systematic review showed moderate evidence that pharmacological interventions, compared to placebo or other pharmacological interventions, likely reduce pain intensity, but this effect was not sustained long term.¹² It is necessary to exercise caution with pharmacological interventions. In summary, there is no high-quality evidence for the use of any pharmacological intervention in children and adolescents.⁷ This is due to lack of data and the barriers to conducting clinical trials of pharmacological interventions in this population.⁷

Clinical Application Only anticonvulsants (pregabalin) reduced pain intensity at posttreatment. Even though paracetamol is 1 of the most used medications for musculoskeletal pain in children and adolescents, there are limited data for its effect on pain relief.^{11,12} Antidepressants or nonsteroidal anti-inflammatory drugs (ie, ibuprofen) showed no benefit for pain reduction. Pharmacological interventions should be used in combination with physical and psychological interventions.¹² Opioids do not have long-term efficacy for persistent pain in children and adolescents and have a poor safety profile.¹³ Opioids should only be prescribed by specialist providers, with careful assessment of the benefits and risks.⁵¹

Holistic and Complementary Therapies

What Does the Evidence Say? Holistic and complementary therapies are usually provided in conjunction with conventional treatment. Among the options for holistic and complementary

therapies, acupuncture, massage, and relaxation techniques have been used in children and adolescents, but evidence for the effectiveness for children and adolescents with persistent pain is scarce.^{17,24,46}

A systematic review reported that acupuncture and hypnosis can have a positive effect on pain management in children; however, most of the evidence comes from procedure-related pain or pain in newborns.²⁴ A few studies have shown that massage, hypnosis, and relaxation techniques may be beneficial for persistent pain in children.^{6,23,24,44} However, the evidence base is small, and methodological quality of the studies is low—there is considerable uncertainty regarding effectiveness.

Clinical Application There is insufficient evidence of effectiveness and no evidence regarding adverse effects for holistic or complementary therapies. The evidence base is insufficient to justify recommending using these treatments for children with back pain.

Interdisciplinary and Family-Centered Approaches

What Does the Evidence Say? An interdisciplinary approach is the gold standard for persistent pain in children and adolescents.^{12,14,43,50} This approach is characterized by collaboration among health professionals who work closely and discuss treatment goals together.^{17,21,34} The treatment approach needs to be considered in a group and not in isolation by each therapist. An interdisciplinary approach for persistent pain in children and adolescents was effective in reducing pain intensity, pain-related disability, and symptoms of depression, and the benefits were maintained.²¹

Treatment approaches for children and adolescents should be patient and family centered.^{43,50} Parenting children and adolescents with persistent pain impacts family life.³⁷ Parents report anxiety, depressive symptoms, and parental role stress associated with the persistent pain in their children.³⁸ Furthermore,

there is a pathway correlating the parents' perception and behaviors regarding pain and the painful experiences of the children and adolescents.^{4,13,29,36,38,49} Family-focused approaches can be beneficial.⁸ For this reason, it is important to involve the whole family in the process of decision making, but this does not necessarily give parents the power of decision. Children and adolescents should have autonomy appropriate to their developmental stage and age, as self-efficacy and autonomy may be necessary for achieving goals and behaviors around health.³⁹ Furthermore, patient preferences for interventions must be considered and discussed.³⁹

Clinical Application The appropriateness of interdisciplinary intervention might be assessed through initially developing treatment goals through a shared process including children, parents, and a health professional.⁵⁰ Understanding these goals will help identify whether involving other health professionals is necessary. Usually, an interdisciplinary approach requires at least 3 health professionals working together, with interventions ranging from 1 to 3 times per week.²¹ This approach can be costly in terms of time and resources and may not be feasible for some families or in low- and middle-income countries.

Tailor family-centered interventions to personal aspects, such as age, gender, family structure, educational level, socioeconomic level, and psychological symptoms.^{43,50} Assessing the characteristics of the family can help. Assessments from more than 1 family member could be necessary, as family relationships are often too complex to be understood from 1 perspective alone.³⁶ Multidimensional pain instruments could be useful for this assessment since they assess various aspects of the pain experience (eg, intensity, duration, physical and psychological aspects).³¹ Spending some time to understand the family's routine will allow the therapist to better tailor the intervention to meet the patient's and the family's needs.

Communication Is Key to the Treatment Success

What Does the Evidence Say? Communicating with children according to their developmental stage and communicating with parents to build confidence can be challenging.^{31,40} Communication between health professionals, children, and parents is a key part of the therapeutic alliance, and it is directly associated with intervention adherence.⁴² Children and adolescents may feel insecure and afraid to talk about their problems or feelings with health professionals,⁴² and it is important to give space for discussion about causes, prognosis, risk factors, beliefs, potential impacts of the patient's condition, and available treatments. A shared decision-making framework offers a model to simplify communication between clinicians and patients.⁴²

Clinical Application Communication with children and adolescents needs to be clear, direct, and as simple as possible.⁴² Avoid technical and complex language as it is disempowering; tailor information delivery to the cognition level.⁴² Younger children are commonly underestimated in relation to health literacy, while adolescents are overestimated and receive an excess of complex information beyond their processing capacity.⁴² It is the clinician's responsibility to deliver information in a way that is understood by the patient. It is important that the professional validates the child's experience of pain and aligns treatment expectations.¹³ In some cases, pain will not disappear but can decrease sufficiently to enable life activities to return to normal. It could be helpful to explain that the 4 S's—sports, socialization, sleep, and school—can return to normal before pain disappears or decreases.¹³

There is a need for transparency and trust between health professionals and parents. Parents feel safer receiving as much information as possible about their children's condition.^{42,50} Parents directly influence the treatment of their children; excessive parental attention to pain or disability contributes to catastrophizing of pain in children.^{13,33} This means it may

be necessary to teach parents to focus on their child's function rather than on the disability caused by pain.¹³ Reinforce that parents' experience of pain and disability is different from the child's experience.¹³ Establishing a good relationship between the 3 stakeholders (ie, health professionals, children, and parents) facilitates family decision making, which is supported by honesty; trust; and discussion about the risks, benefits, and treatment options.⁴²

SUMMARY AND IMPLICATIONS

LOW BACK PAIN IN CHILDREN AND ADOLESCENTS is prevalent and needs to be appropriately managed. Physical, psychological, and pharmacological interventions, particularly delivered in combination, are effective for reducing pain intensity and improving disability. The effectiveness of other interventions, including holistic and complementary therapies, is uncertain.

Despite the fact that interventions recommended for managing low back pain in children are similar to those recommended to adults, clinicians must also consider the context, meaning, communication, and delivery mode that could influence treatment success. Aim for a biopsychosocial patient- and family-centered intervention tailored to age and cognition. When communicating with children and adolescents, use clear, direct, and simple language; avoid technical and complex language. A trust relationship between health professionals, children, and parents facilitates family decision making and supports intervention adherence. We recognize that there is a dearth of high-quality evidence to guide treatment decisions for these patients and hope ongoing and future research will add to the evidence base. ●

KEY POINTS

FINDINGS: Physical, psychological, and pharmacological interventions, delivered in combination, are effective for

persistent low back pain in children and adolescents.

IMPLICATIONS: Children and adolescents are not little adults. Clinicians need to consider the age, cognition, and family dynamics when tailoring interventions.

CAUTION: There is a lack of high-quality evidence to guide treatment decisions for children and adolescents, and it is expected that future research will add to the evidence base.

STUDY DETAILS

AUTHOR CONTRIBUTIONS: All authors were involved in the conception and design of the manuscript. Ms Leite and Dr Yamato drafted the manuscript, and all authors revised and approved the final version. All authors take responsibility for the integrity of the data and the accuracy of the manuscript.

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