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How back pain influences daily activities and quality of life: Incidence of back pain related to age

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Abstract

Low back pain is a prevalent global musculoskeletal issue, with a lifetime prevalence ranging from 49% to 70% in adults. Traditionally associated with adults, recent field surveys indicate comparable prevalence rates in children and adolescents, challenging earlier assumptions. Non-specific low back pain, where the source cannot be identified through diagnostic imaging, accounts for about 80%–90% of cases. Studies have shown that over 80% of adolescents with low back pain exhibit no underlying pathology. The prevalence of low back pain in younger populations varies widely, influenced by study methodology, age, and pain types. Research suggests that back pain prevalence in adolescents increases with age, with a shift in attitudes considering it is not necessarily indicative of specific issues.

Level of evidence: level V.

Keywords: Low back pain, quality of life, children

Introduction

Low back pain (LBP) is one of the most common musculoskeletal problems globally, with the estimated lifetime prevalence in the adult population between 49% and 70%.[1] The term LBP describes the unpleasant sensation located between the 12th rib and gluteal folds, and it may or may not radiate to one or both legs.[2] This health issue is usually attributed to the adult population and affects the global socioeconomic systems causing premature retirement more frequently than hypertension, heart disease, neoplasm, respiratory disease, diabetes, and asthma combined.[3] On the other hand, in the previous years, the importance of LBP in pediatric population was depreciated and associated usually with severe underlying diseases like tumors or inflammation. Field surveys, on the contrary, have shown that cumulative life prevalence of pediatric LBP can be comparable to the prevalence data for adult populations.[4] The reason for this discrepancy might result from the classification of LBP into one resulting from specific or non-specific disorders.[5] The term non-specific LBP encompasses situations where the source of pain cannot be confirmed by means of modern diagnostic imaging studies or the course of the disease does not follow the assumed path. About 80% to 90% of all patients with LBP will have non-specific LBP, without any specific pathology.[5] Considering the pediatric population, a similar trend may be observed. Yang et al.[6] showed that in 215,592 adolescents who were identified as presenting with LBP, more than 80% did not demonstrate any underlying pathology. The real-life prevalence of LBP in children and adolescents varies from less than 10% to almost 90% and depends on the methodology of studies, time prevalence, patients' age, specific subgroups of patients, or type of pain.[7] A meta-analysis performed in 2013 showed a lifetime prevalence of 39%, and this figure exhibited a positive, statistically significant relationship with the mean age of the participants in the samples and with the publication year of the studies.[8] The age of 10 forms a border between the prevalence similar to those in adults and one relatively

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Figure 1. Health in the eyes of a primary school girl.

low.[9] This led to a shift in the attitude toward back pain in adolescents. According to Frosch et al.,[10] it should not be considered a "red flag" for unspecific back pain, while pain occurring in the first decade of life remains disturbing and needs further examination. A question that continues to be under examination is whether LBP exerts a similar influence on the quality of life (QoL) of children and adolescents as it does in the adult population. Hestbaek et al.[11] already in 2006, in their prospective, 8-year follow-up study of 9600 twins, showed correlations between LBP in children and in adults.

Quality of life, definition, methods of assessment

The term "quality of life" is defined by the World Health Organization as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns." Therefore the concept of QoL is fundamentally a subjective notion that encompasses various life domains.

Standard indicators of QoL encompass wealth, physical and mental health, the environment, education, employment, recreation and leisure time, social belonging, safety, security, religious beliefs, and freedom.[12] The term "health-related quality of life" (HRQoL) involves the assessment of QoL in relation to health. HRQoL evaluates an individual's or a group's perceived physical and mental well-being over a period of time. In this context, QoL pertains to the assessment of the overall impact of illness on functioning. The concept of children's QoL is multidimensional. Children, contrary to adults, may analyze QoL in a totally different way (Figure 1). In addition, the perception of QoL depends on growth and mental development. Measuring the QoL in children requires a comprehensive approach including their physical, psychological, social, and emotional well-being. There are several methods designed for children and assessment of QoL.[13] These tools can be divided into several groups:

1. Generic health-related quality of life instruments: Pediatric Quality of Life Inventory (PedsQL) and Child Health Questionnaire (CHQ). The first is a popular, widely used tool assessing physical, emotional, social, and school functioning in different age groups.[14] The second concerns physical and psychosocial well-being with domains including physical functioning, mental health, and family functioning.[15]

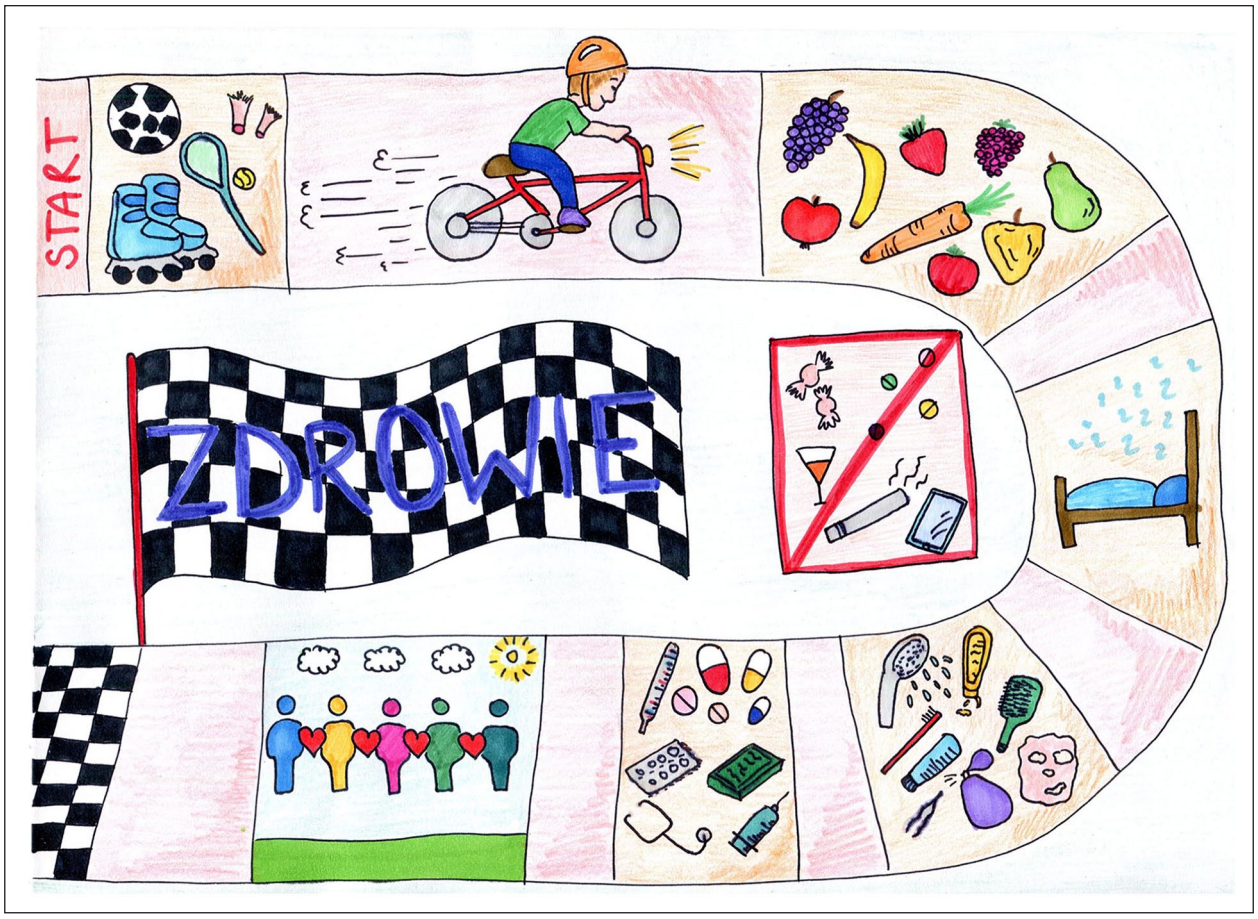

Figure 2. Health from the perspective of a teenager from secondary school.

2. Disease-specific instruments (e.g. Juvenile Arthritis Quality of Life Questionnaire or Cystic Fibrosis Questionnaire).[16,17] They are designed for specific diseases that impact the child's QoL.
3. Visual Analog Scales (VAS): These scales ask children to rate QoL by simply marking a point on a line that represents their level of well-being.
4. EuroQol Youth Version (EQ-5D-Y). This is an adaptation of the EQ-5D for adults, designed for children and adolescents. It assesses not only mobility and self-care but also mood.[18]
5. Pediatric Functional Independence Measure (WeeFIM), concerning functional status of children with disabilities.[19]
6. Subjective Well-Being Scales, with simple questions and visual scales.
7. Qualitative Interviews and Focus Groups. This is not a quantitative tool, but it allows children to express their feelings and experiences regarding their QoL.

When measuring QoL in children, it is important to consider their developmental stage, cognitive abilities, and cultural background. Utilizing a combination of self-report measures, parent or caregiver reports, and clinician assessments can provide a comprehensive understanding of a child's QoL (Figure 2). In addition, involving children in the development and validation of QoL measures ensures that their perspectives and experiences are accurately captured. The exploration of children's QoL has seen significant growth in the past decade (Table 1).

Low back pain: risk factors, quality of life

In the identified literature, seven articles were found that met the search criteria for "low back pain" AND "adolescents" AND "quality of life," or "low back pain" AND "children" AND "quality of life" (one article was located using both sets of keywords). Out of these, six studies concentrate on children and adolescents, with one specifically addressing caregivers of children with disabilities and the elderly (Table 2).[20]

Santos et al.[25] highlight that 27.3% of children surveyed in the study reported experiencing LBP in the last month, indicating a relatively high prevalence of LBP in the young population. LBP can lead to a diminished overall perception of health-related QoL and may impact both physical

Table 1. Number of articles found in PubMed and Google Scholar using specific keywords (17 September 2023).

	PubMed	Google Scholar
"quality of life" AND "children"	6683	5,640,000
"quality of life" AND "adolescents"	58,629	4,950,000
"quality of life" AND "pain" AND "children"	6508	3,930,000
"quality of life" AND "pain" AND "adolescents"	8135	2,550,000
"low back pain" AND "children"	2171	4,240,000
"low back pain" AND "adolescents"	5040	2,230,000
"low back pain" AND " children" AND "quality of life"	3	3,900,000
"low back pain" AND " adolescents" AND "quality of life"	5	1,230,000

Table 2. Articles concerning low back pain among children and adolescents (found by these keywords).

Authors	Research design	Population sample	Data collection techniques
Fontecha et al.[21]	Retrospective, case-control	76 + 152	KIDSCREEN-52, Roland-Morris Disability Questionnaire, Hannover Functional Ability Questionnaire
Galozzi et al.[22]	Cross-sectional study	409 adolescents, 14–17 years	Structured, questionnaire specially designed for this survey and SF-36 (36-Item Short Form Survey)
Macedo et al.[23]	Cross-sectional study	149 adolescents, 11–17 years	Personal Questionnaire, RolandMorris Disability Questionnaire (RMDQ), Pediatric Quality of Life Inventory (PedsQL).
Pellisé et al.[24]	Cross-sectional study	1470 adolescents with a mean age of 15.05 years	KIDSCREEN-52, the Roland-Morris Disability Questionnaire, the Hanover Functional Ability Questionnaire
Santos et al.[25]	Cross-sectional study	377 children, 6–12 years	Pediatric Quality of Life Inventory (PedsQL, version 4.0) + antropometric and kinesiologic measurements
Świerkosz & Nowak[26]	Cross-sectional stay	21 + 11, idiopathic scoliosis patients	WHOQOL (World Human Organizations Quality of Life questionnaire) and MPQSF (Short Form of McGill Pain questionnaire)

and emotional functioning.[25] In research involving teenagers, Pellisé notes that LBP is a prevalent symptom, although it typically has minimal effects on health-related QoL. Pellisé et al.[24] observed that only LBP associated with whole-body pain significantly influences QoL. In contrast, the findings of Macedo et al.[23] indicate that adolescents with LBP exhibit lower levels of physical functioning and a lower physical health summary score. Among these adolescents, girls tend to experience higher disability and lower QoL than boys.[23] Similar results were presented by Galozzi, illustrating the significant impact of LBP on both health and social performance. Galozzi et al.[22] underscores the frequency of LBP among Italian school adolescents, suggesting the necessity of strategies aimed at mitigating the effects of LBP on QoL.

Fontecha et al.,[21] in their study, observed that adolescents seeking specialized medical attention for LBP exhibit better health-related QoL than symptomatic peers from the general population. However, these adolescents report worse clinical and functional statuses. Świerkosz and Nowak[26] evaluated the treatment of LBP and found that a combination of manual therapy and rehabilitation exercises effectively reduces LBP in adolescents. It is worth noting that their study participants included individuals with idiopathic scoliosis.

Non-specific LBP, although rare in childhood, is more frequently encountered among adolescents.[22] As stated by Galozzi et al.,[22] LBP constitutes "a sensory and emotional experience that profoundly impacts well-being." Therefore, it is crucial to consider this condition within a comprehensive biopsychosocial framework. LBP significantly compromises the QoL in pediatric patients.[22] Generally, pain disrupts children's functioning.[27–29] LBP, to some extent, leads to disability and interferes with daily activities in as many as 10%–40% of adolescents.[28,29] In an Italian study involving teenagers, over 60% reported experiencing at least one episode of LBP. This occurrence correlated with the type of school attended and the duration of physical activity engagement (with more activity correlating to increased severity).[29] According to their findings, the type of school influenced the frequency of LBP due to several hours per day spent in inadequate postures coupled with specific workloads.[29]

LBP in the past does not show a significant correlation with SF-36 questionnaire scores, indicating that the complete resolution of pain does not influence the current QoL. According to Galozzi et al.,[22] boys with a history of LBP exhibited lower QoL scores only in the vitality domain, while girls demonstrated poorer physical and mental QoL measurements; others found no gender

differences.[30] In contrast, Pellisé et al.[24] reported that LBP has minimal impact on health-related QoL, emphasizing that only LBP associated with whole-body pain significantly influences QoL. These variations in findings could be linked to the average age of participants or potentially influenced by the menstrual cycle in girls.[22,31]

Musculoskeletal pain in children has been linked to heightened perceived stress at school, as documented by Palermo.[28] Persistent, chronic pain can significantly impact a child's participation in various activities, including school and social interactions. Pain is associated with increased school absenteeism, diminished overall happiness, and a less positive self-perception among affected children.[27] Moreover, pain affects the dynamics between children and their parents. Children experiencing pain tend to have lower scores on the KIDSCREEN-52 questionnaire, indicating reduced satisfaction with their ability to cope with school-related challenges.[27] In addition, chronic pain not only disrupts school activities but also interferes with sleep patterns.[28]

Several studies have emphasized a higher prevalence of LBP in girls, which is associated with lower QoL scores across domains related to physical and emotional functioning, psychosocial health, and physical well-being.[23] The research by Kolb et al.[32] in Germany highlighted a high prevalence of LBP among both girls and boys, with similar gender differences observed.

LBP in adolescents has been consistently associated with impaired physical functioning and lower physical health summary scores as indicated by the PedsQL.[23] Pellisé observed a higher prevalence of LBP in teenagers, particularly among 15-year-olds. These findings revealed that isolated LBP was more common among boys, with mild pain intensity. In contrast, LBP associated with whole-body pain was more frequent among girls and presented with greater severity.[24] A substantial prevalence of LBP was reported among Swedish adolescents, particularly among girls, according to the comprehensive cross-sectional study by Sundell et al.[33] involving students aged 16–20 years. Girls experienced LBP more frequently and for more extended durations. Interestingly, while regular sports activities are generally beneficial, engaging in sports for over 6 h per week was associated with a higher risk of LBP. Certain sports, such as rugby, golf, athletics, volleyball, judo, and gymnastics, displayed higher risk ratios for developing LBP.[34] Structural causes were identified in more than 80% of LBP cases among young athletes, while nonspecific LBP was rare.[35]

Furthermore, excessive television viewing time has been linked to LBP. Prolonged periods of sitting, coupled with poor posture and lack of physical activity, are potential factors contributing to LBP. Watching television for more than 1 h per day was associated with LBP in 50% of children.[36] While sitting position strongly correlates with LBP, it has not been definitively established as a causative or exacerbating factor.[4,37]

Is backpack weight a risk factor for LBP in adolescents? While Macedo et al.[23] did not observe a direct correlation, several variables may influence the results. First, the manner in which students carry backpacks varies; some use one shoulder, some both, and others opt for wheeled bags. Second, the weight of the backpack appears to be relevant. Heuscher et al.[31] noted a connection between increased backpack weight and the prevalence of LBP, suggesting a recommendation to limit backpack weight to 10% of the individual's body weight. The third variable to consider is the daily commute between home and school. Traveling by car may not be associated with LBP, even with a heavy backpack.[23] Conversely, children in Africa are prone to experiencing LBP if the distance between home and school exceeds 30 minutes on foot.[38]

There are several other factors that can influence LBP, such as family history of LBP, increased height, smoking (among children!), depression, and emotional or stress factors, so further investigations are crucial.[37]

Conclusions

In summary, non-specific LBP in children and adolescents has a significant impact on their QoL and overall well-being. While rare in childhood, it becomes more prevalent during adolescence.[1,39] LBP is a complex sensory and emotional experience that profoundly affects the affected individuals. The condition compromises physical and emotional functioning and can lead to disability, affecting daily activities and school attendance (Figure 3).

Studies have shown variations in how LBP affects boys and girls. Boys with LBP tend to have lower QoL scores in specific domains, whereas girls, especially those experiencing whole-body pain, exhibit more severe impacts on both physical and mental QoL. Musculoskeletal pain, including LBP, is associated with heightened stress at school, affecting participation in various activities and social interactions.

The prevalence of LBP is higher in girls and is connected with lower QoL scores across different aspects. Sports activities, while generally beneficial, can also increase the risk of LBP, especially if done excessively or in certain sports like rugby, golf, athletics, volleyball, judo, and gymnastics. Prolonged television viewing and sedentary behaviors also contribute to LBP, particularly in children who sit for extended periods with poor posture.

Regarding backpack weight, while no direct correlation was found, several factors influence its impact on LBP. The manner of carrying backpacks and their weight distribution are crucial factors. Recommendations include limiting backpack weight to 10% of the individual's body weight to reduce the risk of LBP.

Understanding these complexities is essential for health care professionals to devise effective strategies for prevention and management, ensuring the well-being of children and adolescents dealing with LBP.

Figure 3. Health in the eyes of a boy from kindergarten.

Author contributions

Both authors (TP and BJ) contributed equally to the writing and reviewing of the manuscript.

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