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Evidence- based Management Options for Nonspecific Musculoskeletal Pain in Schoolchildren

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ABSTRACT

Introduction: Children of school age (8-15 years) have a significant prevalence of non-specific musculoskeletal pain (from 11 to 38%, in our country as much as 48%), which represents a neglected public health problem without adequate preventive interventions. Health workers have little empirical evidence to support their clinical practice in deciding on intervention measures and treating this pain. **Aim:** The aim of this review article is to expand knowledge of the management of non-specific musculoskeletal pain in school children based on the evidence. **Material and Methods:** The systematic review of literature was carried out at Biomed Central, PubMed, Scopus and Web of Science databases in search of relevant evidence supporting the research goal. **Results**: A total of 564 publications were reviewed and 523 were considered irrelevant. The remaining 47 publications were assessed as potentially relevant, and among them 39 did not meet the criteria for inclusion and exclusion. Therefore, 9 publications met the necessary criteria for further analysis. **Conclusion:** There is little evidence to create an integrative program of intervention measures and treatment of musculoskeletal pain in school children. Based on scarce number of proofs shown in this research, no conclusive solutions have been reached, necessitating a need for further research.

Keywords: non-specific musculoskeletal pain, school-age children, evidence-based medicine, interventions, treatment.

1. INTRODUCTION

School children represent the healthiest population, and at the same time they are a vulnerable group in regard of development of musculoskeletal pain due to progressive growth and development (1). Musculoskeletal pain (MP) in school children varies from light, transient, to severe disorders that interfere with physical activity, impair health and prevent quality of life. Non-specific, non-traumatic musculoskeletal pain (NMP) is more frequent than traumatic in childhood (2) and has a significant prevalence in school children. It is mostly neglected due to very few clinical indications (3, 4). MP by duration can be incidental (acute, transient) when the student suffers for up to 7 days, or chronic (1). Chronic pain is defined as a pain lasting more than 3 months, and its prevalence in school children ranges from 11 to 38% (5). Various risk factors for NMP can be involved in the course and the development of pain. The occurrence of NMB has a multidimensional psychosocial base also (7). The development of NMB from age to gender, while knowledge of consequences is limited (8-11). The prevalence of NMP in the school population of children in Bosnia and Herzegovina is very high, 48% (12).

School children who suffer from musculoskeletal pain in school age and adolescence have an increased risk of developing recurring, chronic pain and musculoskeletal functional disorders in adulthood (13-15). In spite of data on the prevalence, impact and long-term effects of NMP in children and adolescents, there was no significant effort invested in harmonization and systematic research. As a consequence, there are large gaps in comprehensive understanding of the problem (11), starting with school children, their parents, school, government and non-governmental sector, especially doctors who are in charge of NMB treatment in the youngest population. Empirical evidence does not help in decision-making in the interventions and treatment choices (16). No risk assessment,

References (author/s)	Screen tool(self-reported instruments)	Acute NMP per location	Chronic NMP per location	Risk-Intervention	Treatment	Year	Country	Number of participants
Kamper, et al., review (11)	Teen Nordic Musculoskeletal Screening Questionnaire (TNMQ-S)	not reported	reported	reported	Not clear, need reviews resarch	2016	Brazil	not reported
Clinch i Eccleston., review (17)	not reported	not reported	reported	not reported	reported	2009	United Kingdom	not reported
Stinson, et al., review (18)	not reported	not reported	reported	not reported	reported	2016	United Kingdom	not reported
Eccleston and Clinch.,review (19)	not reported	not reported	reported	reported, but outcomes	reported	2007	United Kingdom	not reported
Fisher et al., (20)	not reported	not reported	reported	not reported	psychological treatment	2018	United Kingdom	2884
Perić, et al., art. (21)	not reported	not reported	reported but traumatic pain not NMP	polates ball excercise	not reported	2015	Serbia	55
Brzek et al., art. (22)	antropometric measure, physical examination, posture assessment	not reported	reported	the weight of school bags	adaptation of school bag,adequate posture	2017	Poland	155 scholgirls
Vidal et al., art. (23)	Adapted Nordic Musculosceletal Questionnaire (NMQ)	reported	not reported	school education about posture	promotion and preventive intervention on time	2012	Spain	137
Mirmohammadi, et al., art. (24)	antropometric measure	Reported	not reported	corretion weight of schoolbag	prevention, intervention on time	2016	Iran	109

Table 1. Systematic display of selected data

pain screening, risk-control, risk-based treatment is based on individual clinical experience of pain-seeking.

2. AIM

The aim of this review is to expand our knowledge of the management of nonspecific musculoskeletal pain in school age children based on the evidence.

3. MATERIAL AND METHODS

The design of the research is a systematic review as an appropriate method of finding the facts and the conclusion on the effective management of musculoskeletal pain in school-age children. Literature search and systematic review was conducted. The database search process was conducted in: Biomed Central, Pubmed, Scopus, and Web of Science. The combination of the keywords used in this study was as follows: (school children, children and adolescents); (non-specific musculoskeletal pain, musculoskeletal pain); (risk assessment / screening of pain) (risk factors, ergonomic factors, postures, psychological factors); (age, body mass, height, gender); (interventions, treatment, treatment procedures) (ergonomic design / pharmacological treatment / non-pharmacological treatment, physical activity / psychotretman). Criteria for the inclusion of potentially relevant studies were as follows: a) transparent review articles that include a partial insight into the management of the NMP (risk assessment, screening, modes of intervention and treatment); b.) articles that include NMP (risk assessment, screening, modes of intervention and treatment) and non-intervention or placebo control group; g) Measurement and screening of NMP standardized questionnaires. Respondents are school-age children aged 8-15. years. The selected data refer to: 1. study (author, country, number of respondents, acute and chronic NMP, NMP location, risk factors); 2. measurement and screening of NMB; 3rd type of NMB management intervention, the most common combination of intervention and pain management methods.

4. RESULTS

A total of 564 publications were examined, while evaluating key groups of terms, 523 were considered irrelevant and were rejected in the proceeding of the analysis. The remaining 47 publications were assessed as potentially relevant, and among them 39 did not meet the criteria for inclusion and exclusion. Therefore, 9 publications met the necessary criteria for further analysis. The flow of information can be found in detail in Table 1.

5. DISCUSSION

As shown in Table 1, the Camper magazine and associate magazine concluded that there are large gaps in our understanding of NMB in school children. There is a particular need for research that would enable the identification of people at risk of pain and disability, studies that would point out the nature of the relationship between MSK pain and other adverse effects, and research the problem of measurement and screening of NMB. Research on MSK pain in adults can not produce more robust, reliable, and comparable evidence for children and adolescents, which describes a new screening instrument, the Teen Nordic Musculoskeletal Screening Questionnaire (11). Consequently, the provision of adequate treatment based on evidence of treatment is essential for the compensation of the lifelong path of disability (17). In two journal articles focusing on the pharmacological treatment of NMP in school children, the need for an interdisciplinary approach to treatment is emphasized, which mainly focuses on pharmacological, psychosocial and physical support. Other aspects of treatment and interventional activities have not been considered (17-18). In school children who suffer from chronic NMP pain, complex inability and anxiety have been discovered that can have a detrimental effect on the quality of their lives and the lives

of their family members. On the other hand, the database of available treatment data remains small, and there is an urgent need for new research on pharmacological and non-pharmacological treatments. The biggest challenges are organizational, and the concern is how to bring patients into contact with the available treatments. Many patients who may benefit form evidence-based treatment do not currently have it. Theoretical developments are in progress with the aim of explaining chronic pain in the context of the family, as well as attempts by the family to deal with complex disabilities. It is important to evaluate the consequences and outcomes of the chronic NMB on health and disability (19). Mental health disorders associated with NMB also do not have evidence of a recognized recognition, screening, or pharmacological or timely cognitive-response treatment program (20).

A study in Serbia, which included 55 students, eleven-year-olds who suffered from MPs due to the problems of kyphosis and scoliosis of the spine, analyzed the effects of the 16-week Pilates with a ball exercise intervention program. Exercises significantly influenced the reduction of the risk of progression of the disorder and MP (curvature decreased by 4.96 ° or 13.71%) (21). The examination of the musculoskeletal system should be introduced as part of the systematic examination at the school. The use of a school bag should be supervised by teachers, and parents and students should be more aware of the consequences of a heavy backpack. Authors in Spain conducted a survey involving 137 school children aged 10 to 12 in order to determine the effect of an intervention program that implies the influence of the habit of using the backpack properly to hold the body and reduce back pain (23). According to the example of the developed countries, the policy of adjusting the weight of the school bag should be developed, which will help decision-makers in easier approach and solving this problem (24)

6. CONCLUSION

By inspecting the evidence, it is clear that due to a small number of studies, the combination of research results is not correlative, nor reasonable. Their potential useful role in integrating the health of school children is limited. There is insufficient (and / or none) evidence of risk assessment and NMP screening in school age. There is no evidence of the introduction of preventive interventions with the onset of pain in order to combat risk factors, which should begin at the time of the first symptoms of pain. Insufficient results from numerous studies encouraged authors in Poland to introduce a prophylactic program that implies school education about the function of the musculoskeletal system, correct and irregular patterns related to the positions and movements in playing and learning, the causes of postural disorders and how they can affect their physical abilities when they grow up. Parents and children get instructions on how to create an ergonomically healthy workplace in the school and how to control and ensure the ideal position of the body (22). Unfortunately, pain is recognized when it becomes chronic and recurring, therefore pharmacological treatments are usually the first form of treatment. Scarce expertise dominates for this large population to whom the world remains. Creating an integrative program of intervention measures and NMP treatment necessarily requires more research, in particular systematic reviews and meta-analysis.

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