

Prevalence of Playing-related Musculoskeletal Disorders in String Players: A Systematic Review

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ABSTRACT

Objective: This systematic review aimed to assess the methodological quality of articles about the prevalence of playing-related musculoskeletal disorders (PRMDs) in string players and to identify the rate of prevalence and associated factors of PRMD.

Methods: Cross-sectional studies describing data on separate string players published in 5 different languages between January 1, 1980, and January 31, 2014, were included. The following databases were searched: MEDLINE, sciELO, and LILACS. Other sources and reference lists of published papers also were searched. The Loney Scale was used by 2 independent reviewers to evaluate the methodological quality, and only studies that achieved high scores were included.

Results: Of 1910 retrieved articles, 34 cross-sectional studies were selected for methodological assessment. However, only 8 studies reached satisfactory methodological quality scores. The prevalence rate of PRMD was alarmingly high, ranging from 64.1% to 90%. Women and older musicians were more affected in comparison to other instrumentalists. There seems to be a predominance of symptoms in the left upper limb in violinists and violists, whereas cellists and bassists report injuries in the right upper limb.

Conclusions: Professional and amateur string players are subject to development of PRMD. Low response rates were the most observed source of bias, and there is still a lack of publications with high methodological quality in the literature. (*J Manipulative Physiol Ther* 2018;xx:1-10)

Key Indexing Terms: *Musculoskeletal Diseases; Prevalence; Occupational Diseases*

INTRODUCTION

Music can bring out emotions associated with leisure and wellbeing. However, it is difficult for the audience to imagine that the musicians are subject to occupational hazards as they play and perform.¹ Playing an instrument is a very complex task, and a professional musical career carries high physical and psychological demands.² On average, instrumentalists play 1300 hours annually in nonergonomic postures associated with conductor's pressure, performance anxiety, and a competitive work environment.^{3,4} Furthermore, musicians have to practice individually and frequently teach

and perform in chamber groups.⁵ For these reasons, instrumental musicians are subject to a high risk of developing musculoskeletal diseases.⁶

The clinical symptoms include pain and functional limitations. These injuries can compromise their ability to continue playing their instrument(s) permanently and can even end a musician's career prematurely.⁷ Publications that report on health problems and complaints of musicians date back to the 18th century.⁸ One of the first reported cases was Robert Schumann's focal dystonia. A brilliant pianist in his younger years, he was forced by the disease to interrupt his instrumental career to become a composer.⁹ Despite these early reports, it was only in the 1980s that performing arts medicine emerged as a medical specialty. This increased interest was due to an alarmingly high number of injured musicians and the creation of journals concentrating on these artists' problems.¹⁰⁻¹²

Many definitions of occupational diseases have been debated in the literature. Presently, the most accepted term used for music-related injuries is playing-related musculoskeletal disorders (PRMDs).¹³ The concept of PRMD is any "pain, weakness, lack of control, numbness, tingling, or other symptoms that interfere with your ability to play your instrument at the level you are accustomed to."¹⁴ Recent

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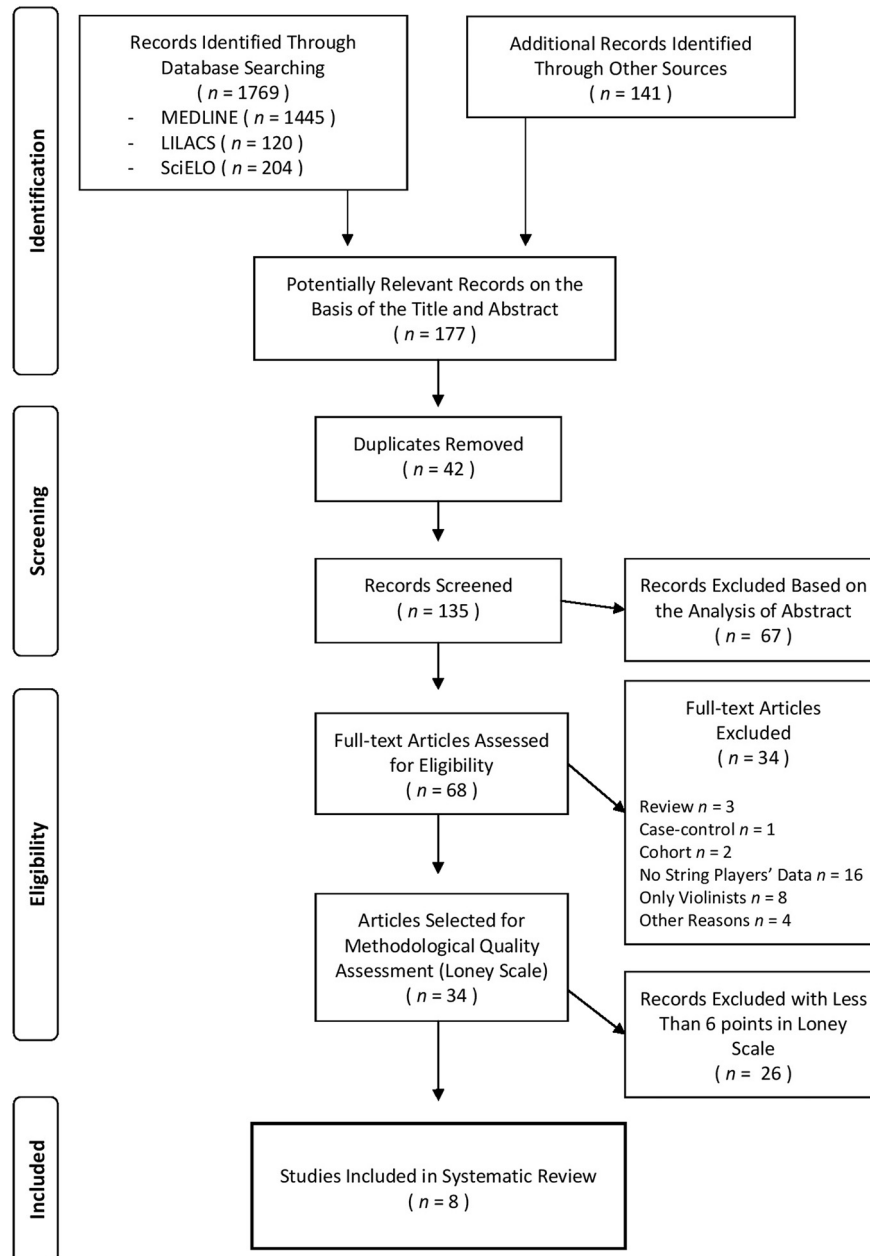


Fig 1. PRISMA flow diagram. PRISMA, preferred reporting items for systematic reviews and meta-analysis.

studies have indicated high prevalence rates of PRMD ranging from 44.7% to 93%, especially in string players.¹⁵⁻²⁰ Symptoms begin to appear when the musician increases the intensity and duration of his or her musical practice. Usually, pain is the artist's first symptom.⁴ It is believed that the etiology of PRMD is multifactorial and can be associated with poor posture, nonergonomic instrument techniques, use of excessive force, and insufficient rest.⁷ In addition, the aspects of instrument shape and size, the duration of rehearsals, and workplace environment can contribute to the development of PRMD.²¹

Conservatories and music colleges need early actions aiming at health promotion and prevention of PRMD. These activities may prepare musicians for subsequent professional demands, protect them from further injuries, and improve their performance.²² Furthermore, it is essential that health professionals understand the instrumentalists' routine and workloads for precise evaluation of their symptoms and appropriate treatment of PRMD.²³

Thus, the aim of this systematic review was to assess the methodological quality of articles about prevalence of

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