Performance related musculoskeletal disorders among musicians: a systematic review.

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1. Introduction
Musculoskeletal disorders cause pain, disability and loss of employment for many workers, including musicians. Musicians can be classified as instrumentalists and non-instrumentalists. The medical problems of instrumentalists include those that are caused directly by playing the instrument, and those that are unrelated to playing. The latter include incidental accidents and problems caused by activities of daily life.

There is a strong body of evidence recognising the prevalence, incidence and types of performance-related musculoskeletal disorders (PRMDs) in this population. Common PRMDs of musicians include overuse problems, such as tendinosis and peripheral nerve entrapment syndromes. These conditions typically affect the upper extremities, the neck, the back and the orofacial musculature.

The main aim of the study was to review the current literature in order to know various measurement tools used, ergonomic risk factors and other finding related to PRMDs among performing musicians.

2. Methods
A systematic review of the published literature was conducted to know about PRMDs among performing musicians. The literature search was done in various search engines including Pubmed, Cochrane Library and Pedro (Physiotherapy Evidence Database). Three reviewers conducted the systematic review based on the PRISMA criteria and any disagreements were resolved through discussion among them. A total of 188 articles were found based on the keywords search using the words "musicians," "performing artist," and "work related musculoskeletal disorders." Limits were set for the studies published between the years 1995 to 2013. The following data were extracted from the obtained studies: study design, type of data collection, participants, assessment tools and outcomes obtained in the respective study. Based on the eligibility criteria the articles were finalised and the rest of the articles were excluded from the systematic review. Only studies in English language were considered for the study.

3. Results
A total of 188 articles were found from search engines and other sources. After excluding irrelevant studies, other languages and duplication, a total of 89 study was considered for further review. Studies conducted were experimental studies, studies on designing, studies on comparing designs, descriptive studies and systematic reviews. After thorough reviewing only 20 studies were considered for the final review. Most of the studies were descriptive and included several recommendations.

4. Discussion
The prevalence of PRMDs in instrumentalists was found to be relatively high, ranging from 39% to 87%. Studies suggested that musicians were equally at high risk of developing musculoskeletal disorders compared to non musicians. Self reported subjective symptoms were most common in neck, back and shoulder. Studies reviewed the effect of various treatment techniques including physiotherapy and Alexander technique in treating PMRD's and were recommended as effective treatment methods. Commonly noted PRMD's were dystonia, hypermobility syndromes, compression neuropathies and tendinosis.

References
Holst GJ, Paarup HM, Baelum J: A cross-sectional study of psychosocial work environment and stress in the Danish