

DEVELOPMENT AND PSYCHOMETRIC EVALUATION OF A SELF-REPORT INSTRUMENT TO MEASURE MUSCULOSKELETAL PAIN IN PROFESSIONAL ORCHESTRA MUSICIANS IN SCOTLAND

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ABSTRACT

Purpose and relevance: Work-related musculoskeletal (MSK) disorders are common in musicians. Many epidemiological surveys on playing-related musculoskeletal disorders (PRMDs) have been carried out among professional orchestra musicians around the world. However, very few of these studies used existing validated instruments, and no attempt was made to evaluate or confirm the psychometric properties of these instruments.^{1,2} The aim of the present study was to develop and validate a self-report instrument to measure MSK pain, and pain interference in terms of function and psychosocial or affective constructs, for a population of professional orchestra musicians. A subsidiary aim was to gather data on prevalence of PRMDs.

Methods: Permanent members (n = 183) of three professional orchestras in Scotland were eligible to participate in the study. Development of the new instrument involved the selection, and modification or adaptation, of the most appropriate instruments measuring MSK pain identified following a literature review. Essential criteria were defined for the new instrument: it should take no longer than 15 minutes to complete; it should follow the international classification of functioning, disability and health (ICF) guidelines set out by the World Health Organisation (WHO);³ it should be an evaluative instrument, able to measure change over time.⁴ Psychometric evaluation of the instrument involved several aspects of validity and reliability.⁵ Content validity was assessed using content validity ratios with a panel of four experts,⁶ and face validity during pilot-testing with three professional musicians. Following data collection, construct validity was tested via an iterative process of principal axis factoring (PAF), a technique of exploratory factor analysis.⁷ Internal consistency and test-retest reliability were then carried out. Guidelines from the consensus-based standards for the selection of health measurement instruments (COSMIN) checklist were followed at every stage of instrument development and psychometric testing.⁸

Results: Members of both the expert and professional musicians' panels agreed that face and content validity were present. Following comments from the two panels, a few modifications were made to the instrument. The instrument was named the Musculoskeletal Pain Intensity and Interference Questionnaire for Musicians (MPIIQM). The response rate from orchestra musicians was 55% (n = 101). Point prevalence of PRMDs was 36.6% (n = 37). The percentage of missing scores was very low, (value = 2.7%). The instrument had a low respondent burden, being completed in less than 10 minutes. The results from the iterative PAF analyses revealed that the MPIIQM had a strong and stable two-factor structure, with nine retained items explaining 71.32% of the variance in the data set. Two meaningful factors or dimensions were defined, i.e. "pain intensity" and "pain interference", with four items loading highly on the factor "pain intensity", and five items loading highly on the factor "pain interference". The MPIIQM had good internal consistency. Cronbach's alpha value for the overall 9-item scale was 0.88. Furthermore, each factor was homogeneous with identical Cronbach's alpha values (value = 0.91). Results from the ICC Model (2,1 – agreement) showed substantial test-retest reliability for the pain intensity items (range 0.78 – 0.82), and moderate to substantial test-retest reliability for the pain interference items (range 0.56 – 0.76).

Conclusion: The results of the present study suggest that the MPIIQM is a promising self-report instrument that could be used to gather data on prevalence of PRMDs, and to measure MSK pain and pain interference in a population of professional orchestra musicians. It showed good construct validity, measuring pain intensity, pain interference with function, and pain interference with regard to psychosocial variables, thereby addressing several of the themes set out by the WHO – ICF guidelines. It was reliable, confirming its properties as an evaluative instrument capable of measuring change over time.

Keywords: pain measurement, musculoskeletal disorders, musicians, psychometrics.

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