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Prevalence and therapeutic measures for guitar-related medical problems: a systematic review

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 1 June 2025 and was last updated on 1 June 2025.

INTRODUCTION

Review question / Objective 1. The prevalence and types of health problems experienced by guitarists will be explored. 2. The factors influencing health problems in guitarists will be examined. 2. The current evidence on the interventions aimed at treating medical problems among guitarists will be explored. 3. The evidence on current available preventative measures for guitar-related injuries will be explored.

Rationale The guitar is one of the most widely played instruments around the world. As this instrument has become more popular, it is now played by a wide range of individuals from full-time guitarists trained at professional schools to amateur hobbyists without formal eduction or training. Like other instruments, playing guitar often requires maintaining an asymmetrical posture for considerably long periods, rapidly moving the small joints of both hands, plucking strings and holing the instruments in a way that introduce excessive stress on certain joints. This can lead to various musculoskeletal and neurological issues, including muscle and ligament injuries in the finger joints, cervial or lumbar radiculopathy, carpal tunnel syndrome and overtraining-induced dystonia.

Despite these risks, the guitar is often overlooked in mainstream classical music field. As a result, there is lack of studies on the scope of heath problems experienced by guitarists, the associated risk factors and the clinical evidence on the treatments or preventative measures. The aim of this study is to review the existing medical literature related to health problems among guitarists and to provide an overview of evidence status regarding preventive or therapeutic interventions.

Condition being studied Guitar related medical conditions will be studied. Musculoskeletal disorders caused by guitar practice or performance including neck pain, upper back pain, low back pain, shoulder pain, elbow pain, finger

joint pain, thenar pain and palmar pain, neurological disorders including dystonia, hand tremor, fatigue, tinnitus, hearing loss, dizziness and headache and psychological issues including depression, anxiety, sleep disorders, strange fright as well as other types of medical problems not categorized under these areas will be all included.

METHODS

Search strategy Publications will be located in Pubmed, Embase and Cochrane library. Searching strategy for each database will be developed using keywords including guitar, guitarist, musculoskeletal disorders, neurological disorders, psychological diseases, medical problem, injury etc. Searching strategy for Pubmed is as follows:
#1 Guitar
#2 "Musculoskeletal Pain"[Mesh] OR "Musculoskeletal Diseases"[Mesh]
#3 ("neck pain"[MeSH Terms] OR neck pain[Text Word]) OR (upper[All Fields] AND ("back pain"[MeSH Terms] OR back pain[Text Word])) OR ("low back pain"[MeSH Terms] OR low back pain[Text Word]) OR ("shoulder pain"[MeSH Terms] OR shoulder pain[Text Word]) OR (("elbow"[MeSH Terms] OR "elbow joint"[MeSH Terms] OR elbow[Text Word]) AND ("pain"[MeSH Terms] OR pain[Text Word])) OR (("finger joint"[MeSH Terms] OR finger joint[Text Word]) AND ("pain"[MeSH Terms] OR pain[Text Word])) OR (thenar[All Fields] AND ("pain"[MeSH Terms] OR pain[Text Word])) OR (palmar[All Fields] AND ("pain"[MeSH Terms] OR pain[Text Word]))
#4 "Nervous System Diseases"[Mesh]
#5 ("dystonic disorders"[MeSH Terms] OR "dystonia"[MeSH Terms] OR dystonia[Text Word]) OR (("hand"[MeSH Terms] OR hand[Text Word]) AND ("tremor"[MeSH Terms] OR tremor[Text Word])) OR ("fatigue"[MeSH Terms] OR fatigue[Text Word]) OR ("tinnitus"[MeSH Terms] OR tinnitus[Text Word]) OR ("hearing loss"[MeSH Terms] OR hearing loss[Text Word]) OR ("vertigo"[MeSH Terms] OR "dizziness"[MeSH Terms] OR dizziness[Text Word])
#6 ("depressive disorder"[MeSH Terms] OR "depression"[MeSH Terms] OR depression[Text Word]) OR ("anxiety"[MeSH Terms] OR anxiety[Text Word]) OR ("sleep wake disorders"[MeSH Terms] OR sleep disorders[Text Word]) OR (strange[All Fields] AND "fear"[MeSH Terms])
#7 #2 OR #3 OR #4 OR #5 OR #6
#8 #1 AND #7.

Participant or population Amateur or professional guitar players experiencing the following conditions will be included: guitar-related medical conditions such as musculoskeletal disorders caused by guitar practice or performance—including neck pain, upper back pain, low back pain, shoulder pain, elbow pain, finger joint pain, thenar pain, and palmar pain; neurological disorders—including dystonia, hand tremor, fatigue, tinnitus, hearing loss, dizziness, and headache; and psychological issues—including depression, anxiety, sleep disorders, stage fright, as well as other types of medical problems not categorized under these areas.

Intervention In this review, any interventions will be included.

Comparator Comparator will not be considered as the inclusion criteria.

Study designs to be included Any clinical studies will be included in this review. For assessing prevalence of various symptoms or diseases, cross sectional studies and survey will be included. For assessing various interventions for the treatment or prevention of specific diseases, case studies, observational studies, randomized controlled trials, systematic reviews will be included.

Eligibility criteria There will be no language limitation in this review.

Information sources Pubmed, Embase and Cochrane library will be searched in this review. Reference list of the included publications will be assessed too. Included studies in other systematic reviews on other musician injuries will be screened too.

Main outcome(s) Prevalence of overall medical problems and individual conditions including musculoskeletal disorders, neurological disorders, psychological issues and other types of medical problems will be assessed.
Details and therapeutic effect (effect size) of individual intervention for each condition will be assessed.
Risk factors related to the guitar-related disorders or injuries will be evaluated.
Prevention measures will be summarized.

Quality assessment / Risk of bias analysis In this review, we will include any types of clinical studies including case studies, observational studies, survey, randomized controlled trials and systematic reviews. For case studies, items in the CARE statement will be evaluated. For observational studies, items in the STROBE statement will be assessed. For randomized controlled trials, risk of bias will be assessed. For

systematic reviews, AMSTAR 2 tool will be assessed.

Strategy of data synthesis To estimate the prevalence of guitar-related injuries, a meta-analysis on the proportions of various types of medical problems will be conducted using the inverse variance method. Double arcsine transformation will be applied to stabilize variance, followed by back-transformation for interpretability. A random effects model will be employed to account for anticipated clinical and methodological heterogeneity across studies. Statistical heterogeneity will be assessed using the I^2 statistic. Publication bias will be evaluated through visual inspection of funnel plots and Egger's test. All analyses will be performed in R using the "meta" package and the "metaprop" function.

Subgroup analysis Subgroup analyses will be performed based on factors such as study design (survey vs. clinical record review) and participant type (amateur vs. professional guitarists).

Sensitivity analysis Due to the nature of the meta-analysis in this study, a separate sensitivity analysis is not being considered.

Language restriction None.

Country(ies) involved Korea.

Keywords Guitar; guitarist; medical problems; prevalence; interventions; prevention; risk factors.

Contributions of each author
Author 1 - Tae-Hun Kim.

References
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2. Bosi, Bráulio. Becoming a healthier guitarist: Understanding and addressing injuries. University of Missouri-Kansas City, 2016.