

**ELECTRONIC GUIDE TO THESES APPROVED BY PHYSICAL
THERAPY DEPARTMENT FOR MUSCULOSKELETAL DISORDER
AND ITS SURGERY
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**Physical Therapy Department for Musculoskeletal
Disorder and Its Surgery**

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Title	:	The Use Of Virtual Reality In The Rehabilitation Of Musculoskeletal Disorders: A Systematic Review.
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Abstract	:	
<p>Background: The integration between the musculoskeletal and nervous system needs to be considered during the assessment and treatment of patients with musculoskeletal disorders. This may be assisted by using valid and reliable methods that simulate real-life situations. Interactive virtual reality (VR) technology can mimic real-life scenarios by introducing various auditory and visual inputs. Also, interactive VR has the advantage of customizing treatment parameters, and hence, delivering effective patient-centered care. However, the quality and strength of evidence regarding the adequacy of its psychometric properties in assessing the musculoskeletal function and its efficacy in orthopedic disorders rehabilitation have not been evaluated yet. Purpose: Systematically review and critically appraise the quality of the evidence supporting the validity and reliability of interactive VR in assessment of musculoskeletal disorders as well as its treatment. This review was conducted in two parts; first to investigate the use of interactive VR as an assessment tool for orthopedic clinical outcomes, and second to evaluate the efficacy of VR in treating orthopedic disorders. Methods: Multiple electronic databases were searched using adequate searching strategy. In addition, manual searching of eligible studies bibliography followed by snowballing using Scopus and Web of Science were done. Screening was conducted first by title, then by abstract and finally by full text. Specific quality assessment tool that suits the review aim was used to assess the strength of evidence provided by the eligible studies. All review stages were conducted by two to three independent reviewers and disagreements were resolved by consensus through discussion. Results: For VR as an assessment tool, nine studies were included in quality assessment. Based on outcome measures, studies were categorized into range of motion (ROM) (n= 3), balance (n= 3), reaction time (n= 1) and, cervical motion velocity and accuracy (n= 2). The majority of the studies were of moderate quality and provided evidence of VR adequate concurrent and, in some cases, discriminative validity. Also, VR showed high intra-rater reliability for most of the measured outcomes. For VR treatment efficacy, fourteen studies were included in the quality assessment. Based on anatomic region, studies were categorized into upper limb (n= 1), lower limb (n= 9) and spine (n= 4). The majority of the studies were of fair quality. Nine studies showed that VR was not different compared to traditional physical therapy. Compared to no treatment, two studies favored VR while two other studies showed no differences. Conclusion: For musculoskeletal assessment, there is a limited promising evidence that interactive VR using games can be considered valid and reliable tool in the assessment of ROM in asymptomatic participants and patients with chronic neck pain and radial fracture. For the remaining outcomes, evidence is limited to draw a robust conclusion. VR treatment efficacy was not different from the traditional physical therapy programs. Thus, it could be used as an alternative option in the rehabilitation of orthopedic disorders of the upper and lower limbs and spine.</p>		
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