R1: The Effectiveness of Different Postures to Recovery After Low Back Muscle Fatigue – A Compilation of Results of 4 Studies

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ABSTRACT

Introduction: Prolong computation in sitting has led to early onset of low back pain. The aims of these 4 studies were to identify the effectiveness of active weight shifting strategy in standing after prolonged computation sitting. **Methods:** Healthy participants performed a Biering-Sorenson test to simulate low back muscle fatigue experience after 2 hours of prolong sitting. In study 1, 17 participants were randomly assigned to performed 35 minutes of sitting or 35 minutes of alternating sit-stand. In study 2, 12 participants were randomly assigned to sitting or standing for a period of 30 minutes. In study 3, 16 participants were randomly allocated to a 15 minute of stationary standing or lateral weight shift every 30 seconds group. In study 4, 19 participants performed 30 minutes of sitting, stand and static step-up positions on 3 separate days. Surface EMG electrodes were adopted the SENAIM recommendation measured bilateral muscle activities of superficial lumbar multifidus, iliocostalis and transverse abdominus. Participants also rated their level of discomfort in their lower back and lower limbs. **Results:** No significant differences in rate of lower back muscle fatigue recovery were found between sit and sit-stand manoeuvres. Significant differences were reported during standing and static step-up compared with sitting. When static standing and lateral weight shifting in standing were compared, no significant differences in rate of fatigue recovery was found. Participants reported less discomfort in the lower limbs when performing step-up compared with static standing. **Conclusion:** Adopting a standing position with a foot-stool relieved fatigue and lower back discomfort and could minimise the onset of low back pain.

KEY WORDS:
Low back pain, muscle fatigue, posture

R2: Effectiveness Virtual Reality Games in Improving Upper Limb Function and General Health among Stroke Survivors

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ABSTRACT

Introduction: The objective of this study was to examine the effectiveness of virtual reality games (VRG) as an adjunct in improving upper limb (UL) function and general health among stroke survivors. **Methods:** This study involved 36 stroke survivors in both experimental (n=18) and control (n=18) groups with a mean age(SD) of 57(8.20) and 63(10.54) years respectively. Outcome measures were Fugl-Meyer Assessment for Upper Extremities (FMA-UE), Wolf Motor Function Test (WMFT), Intrinsic Motivation Inventory (IMI), The Lawton of Instrumental Activities of Daily Living (IADL) and Stroke Impact Scale (SIS) assessed at baseline and 8 weeks post-intervention. The experimental group had 0.5 hours of UL VRG with 1.5 hours of standard physiotherapy and the control group received 2 hours of standard physiotherapy. The intervention for both groups was performed once a week for continuous 8 weeks. **Results:** ANOVA test found a significant time and group interaction effect for IMI ($F_{(1,34)}=8.84$; $p<0.01$), IADL (F=7.95; p = 0.01) and SIS domain of communication (F=4.85; p = 0.03). A significant effect of time for both groups was demonstrated in FMA-UE ($F_{(1,34)}=109.01$; $p<0.01$), WMFT ($F_{(1,34)}=127.44$; $p<0.01$), IADL (F=7.14; $p<0.05$) and SIS domains of Strength (F=16.03; $p<0.01$), domains of ADL (F=10.85; $p<0.01$) and domains of Stroke Recovery (F=42.65; $p<0.01$). However, no significant effect of group on all the outcome measures was found. Overall, the experimental group showed higher percentages of improvement compared to control. **Conclusion:** VRG as an adjunct to standard physiotherapy is effective in improving motivation, instrumental ADL and communication among stroke survivors.

KEY WORDS:
Physiotherapy, virtual reality, upper limb, function, stroke survivors