Xbox Kinect™ to Promote Physical Fitness and Lean Mass in Severely Burned Children: A Randomized Controlled Trial

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Study Protocol

Background: Burns lead to persistent and detrimental muscle breakdown and weakness and poor physical fitness so Rehabilitation following burns is integral to improving physical and psychological outcomes. This study was undertaken to evaluate an alternative exercise rehabilitation strategy, so the aim of this work involving To explore the outcomes of an Xbox Kinect intervention on muscle strength, lean body mass (LBM) and cardiopulmonary fitness in severe pediatric burn.

Methods: Forty burned children with burns covering 40–60% of the total body surface area (TBSA), aged 10–16 years, were randomized into the standard of care (n=20), and Xbox training group (n=20) groups. All burned children received 12 weeks of routine physical therapy program (RPTP). In addition, the Xbox group received Xbox training involving five games for 50min a day, three times a week for12 weeks .Outcomes were leg muscle strength was assessed as peak torque using a Biodex Isokinetic Dynamometer, Oxygen consumption capacity, measured as peak VO2, was studied using a modified Bruce treadmill protocol, and lean body mass was determined using dual-energy X-ray absorptiometry. Outcomes were measured at baseline and after 12 weeks of intervention.

Conclusion: These findings suggest that the use of XbK intervention is a valuable, feasible and pleasant approach in order to improve muscle strength, lean body mass (LBM) and cardiopulmonary fitness in severe pediatric burn Xbox Kinect virtual reality could offer as a therapeutic and motivational tool when used with children burn.

Keywords: Severely burned children, interactive video games, Xbox Kinect™ ; lean body mass; VO2 Peak; muscle strength; Enjoyment.

Statistical Analysis Plan

Reported data was analyzed using Statistical Package for Social Sciences (SPSS) computer program (version 23 windows) (Charles R Flint, New York, USA). Normality test of data using Shapiro-Wilk test was used, that reflect the data was normally distributed. There were no univariate or multivariate outliers, as assessed by boxplot and Mahalanobis distance ($p > 0.05$), respectively; there were linear relationships, as assessed by scatterplot; no multicollinearity. There was homogeneity of variances ($p > 0.05$), as assessed by Levene's test of homogeneity of variances. So, parametric analysis was performed.

Potential differences in baseline demographic between groups were examined using independent sample t-tests. 2×2 mixed design MANOVA was used to examine the effect of

treatment on the measured dependent variables (LBM, trunk, leg, Vo2 and PT) within group as the between-subject variable (experimental received …… and control received ……..), and time as the within-subject variable (pre and post treatment). The variable of interest was the group-by- time interaction at an a priori alpha level of 0.05 and 95 % confidence interval.