
The effect of Just Dance Kinect™ on the attention span of selected college students

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Abstract

Introduction This study determined the effect of Just Dance Kinect™ on the attention span of selected college students in the UERMMMCI College of Allied Rehabilitation Sciences.

Methods Study subjects underwent a two-week intervention by playing Just Dance Kinect™ for ten minutes each session thrice a week. The pre- and post-intervention attention span scores were determined using the Repeatable Battery for the Assessment of Neuropsychologic Status and compared.

Results There was a significant 8-point increase in the Repeatable Battery for the Assessment of Neuropsychologic Status attention span scores of 30 participants after two weeks of intervention with Just Dance Kinect™. No adverse events were reported by the participants.

Conclusion Just Dance Kinect™ appears to be potentially beneficial in improving attention span among college students.

Key words: Just Dance Kinect™, exer-gaming, attention span, Repeatable Battery for Neuropsychological Status (RBANS)

With the advent of modern day technology, sharing of knowledge has become more convenient and easily achievable with the use of interfaces or computerized training applications. However, computer-based training currently lacks the ability to monitor human behavioral changes, amidst reports on how these technological advances impact on the psychosocial dimensions of man.¹ Among these behavioral and psychosocial variables which appear to be influenced by computer technology is the attention span of individuals, defined as the

concentration of awareness on some phenomenon to the exclusion of other stimuli.² Others have suggested that high level aerobic activities, for example during exer-game play, increase attention span and subsequently improve cognitive functioning.³ In addition, Kinect-based learning activities allegedly support multiple physical engagement patterns, and consequently allow individuals to utilize a larger spectrum of their multiple intelligences.⁴ In spite of these early observations, the specific effect of exer-gaming, specifically Just Dance Kinect™, on the cognitive ability of attention has remained unclear, and there is paucity of literature on the exact mechanism on the causal relationship of these two variables.

This study investigated the effect of Just Dance Kinect™ on the attention span of selected students from the College of Allied Rehabilitation Sciences of the University of the East Ramon Magsaysay Memorial Medical Center, Inc.

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Methods

This was a one-group longitudinal (i.e., pre-intervention and post-intervention quasi-experimental) study that looked into the effect of Just Dance Kinect™ on the attention span of selected students of the UERMMMCI College of Allied Rehabilitation Sciences (CAREs) in Academic Year 2015-2016. Potential subjects were screened with a questionnaire and those who consented and qualified underwent the Just Dance Kinect™ exercises for two weeks. Attention span was measured using the Repeatable Battery for Neuropsychological Status (RBANS). Pre- and post-intervention scores were determined and compared.

Male or female Level II and III students enrolled in the BS Physical Therapy and BS Prosthetics and Orthotics for the second semester of Academic Year 2015-2016 who had not played Just Dance Kinect™ within the past two months, could tolerate computer projector exposure for at least ten minutes without experiencing nausea/vomiting or feeling of uneasiness or discomfort, were recruited by purposive sampling. Those who gave their consent and/or assent were included. Sample size was estimated at 30 subjects based on a previous study.⁵ A self-administered questionnaire, reviewed and approved by the faculty, was used to screen for eligible study participants.

Prior to the actual testing, an orientation for the study participants was conducted by the investigators. All procedures were carefully explained to the study subjects, including an introductory session on Just Dance Kinect™, mechanics of actual intervention such as the duration of each session, number of sessions, and other details, and schedule of measurement of attention span levels using the RBANS. Study subjects were also instructed to report any and all unwanted or adverse effect/s associated with the use of Just Dance Kinect™. In such instances, study subjects were directed to the UERM Memorial Hospital for further evaluation and management. All subjects were given the opportunity to confer with the investigators for all their concerns, related to the study protocol.

All study participants were subjected to the RBANS, specifically digit span and coding, to determine their baseline attention span. The RBANS was administered by a single licensed clinical psychologist. The test was conducted for about 25 minutes per participant, in a room with

temperature regulated at 18°C, in compliance with the International Fitness Association requirements. To ensure adequate lighting, 16 fluorescent ceiling lamps were switched on in the testing room. School tables and chairs were provided in the examination room, and study participants occupied seats two to three meters apart from each other. The whole RBANS exam was administered, despite the fact that the only part being evaluated was the attention span.

Two weeks after determination of baseline RBANS attention span levels, participants started playing the Just Dance Kinect™ game inside a room with eight fully lit fluorescent ceiling lamps, two air-conditioning units maintaining a temperature of 18°C, an LCD unit with a projector screen, and with one facilitator. All windows were covered and chairs were moved to the side to prevent distraction and obstruction during the session.

The session involved four participants simultaneously playing Just Dance Kinect™ given 3 feet of space from each other using the Kinect™ sensor projected to a screen. Each session lasted ten minutes, involving two songs at a time, with a one-minute rest period. The participants stood ten feet away from the projector screen, which was more than the recommended minimum distance of 6 feet. There were three sessions in one week.

For the first three sessions, the difficulty level of the songs were "easy", while the following two sessions were at a difficulty level of "medium", and the last session was at a difficulty level of "hard". In addition, participants were restricted from eating 2 hours before playing the game and were not allowed to engage in any other similar video game (e.g., exergaming) for the duration of the study. All participants were subjected to the same/controlled environmental conditions throughout the study.

After two weeks of intervention, the participants were reassessed using the same tool. The post-intervention RBANS was administered in the same manner as the baseline determination under the conditions previously described. The same clinical psychologist scored and interpreted the RBANS. A paired t-test was used to determine the significance of the difference between the pre- and post-intervention scores, with the level of significance set at 0.05

Results

From the target population, 55 students were purposively sampled; 30 met the inclusion criteria and were recruited to participate. Their mean age was 19.2 years and the male - female ratio was 2:3, as seen in Table 1. There was an 8-point increase in the mean RBANS scores after the intervention and the difference from the baseline was significant, as seen in Table 2. No adverse events were reported by any of the participants.

Table 1. Sociodemographic profile of study subjects (N = 30).

Variables	Study Subjects
Age (yr), X ± SD	19.2 ± 0.71
Gender	
Male	12 (40%)
Female	18 (60%)

Table 2. Results of pre-intervention and post-intervention RBANS attention span scores (N = 30).

RBANS, attention span	Mean score
Pre-intervention attention span	98.8 ± 15.32
Post-intervention attention span	106.9 ± 13.15
Change from pre-intervention to post-intervention*	8.1 ± 18.26

* p = 0.02, 95% CI -14.89, -1.25, paired t-test

Discussion

The results were consistent with previous studies, which showed improvement in attention span scores after at least two weeks of intervention using exergaming, such as Just Dance Kinect™.^{6,7} Exergaming was noted to positively impact on attention span, suggesting a direct link between action game play and attention enhancement.⁸

This study focused on a generally younger population, aged 16 to 20 years. In a similar study involving elderly subjects, the same improvement in executive cognitive performance was seen with exposure to kinect-based exercise games.⁹ This reflected the potential for exergaming to enhance different aspects of intellectual function, including cognition, across a wide age-range of population groups. Despite the short period of intervention, there appeared to be significant improvement in attention levels using the RBANS. However, the exact mechanism as to how this effect came about remains

undetermined. This was not part of the scope of this study.

Given the promising result of this study, it appears that exergaming may have the capacity to improve attention span. Nonetheless, it should be highlighted also that no long-term follow-up observation was performed to ascertain if there would be any adverse effect associated with the intervention. Similarly, other aspects of cognition - memory, recall, and analysis - were not examined in this study.

Just Dance Kinect™ appears to be potentially beneficial in improving attention span among college students. However, long-term impact of exergaming on the various facets and components of cognition, including memory, ought to be evaluated and examined. Likewise, further investigation on various population groups stratified into according to gender, age or socioeconomic status may prove to be informative in better understanding the phenomena in the brain during exergaming which result in enhanced attention span.

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