

Exercise Video Games: a Randomized Clinical Trial

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Original paper:

Exercise Videogames, Physical Activity, and Health: Wii Heart Fitness: A Randomized Clinical Trial

Bock, B. C., Dunsiger, S. I., Ciccolo, J. T., Serber, E. R., Wu, W.-C., Tilkemeier, P., Walaska, K. A., Marcus, B. H. (2019). Exercise Videogames, Physical Activity, and Health: Wii Heart Fitness: A Randomized Clinical Trial. *American Journal of Preventive Medicine*, 56(4), 501–511. <https://doi.org/10.1016/j.amepre.2018.11.026>

Link to original paper online:

<https://www.sciencedirect.com/science/article/pii/S0749379718324528>

Project created for the class:

Visual Thinking and Composition, Winter 2020

Tilburg University, Department of Communication and Cognition

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Summary article

Introduction

A major leading cause of preventable death in America is physical inactivity. Despite the national guidelines about recommended physical activity (PA), health benefits of PA, and health risks that come with physical inactivity, half of the U.S. adults self-report being sufficiently active to meet national guidelines (Bock et al. 2019). This among others, is a reason why there is need for effective approaches to encourage PA, and to help people maintain this behavior. Therefore, more research has been conducted about physically active videogames, also known as exercise videogames (EVGs), including platforms like Nintendo Wii and X-box 360 Kinect. According to several articles mentioned in the study of Bock et al. (2019) EVGs result in enjoyable exercise experiences, but this is mostly tested among children and adolescents.

Bock et al. (2019) established six hypotheses based on the goals and findings:

1. "At week 12, EVG and standard exercise participants will engage in significantly more minutes of MVPA than controls;
2. At week 12, EVG participants will engage in significantly more MVPA than standard participants;
3. Adherence to recommended PA will be greater in the EVG arm than in the standard arm;
4. At follow-up, EVG participants will engage in significantly more MVPA than standard participants;
5. Both EVG and standard groups will show significantly greater improvement in cardiovascular health risk indicators than controls;
6. EVG participants will show greater improvement in these measures than standard participants" (Bock et al., 2019).

In short, adults who engage in regular physical activity have lower rates of morbidity and mortality than those who do not. Exercise videogames may offer an attractive and fun way to encourage PA and to help people maintain this behavior. This study compared EVGs with standard exercise to examine the effects of EVGs.

Methods

Study design

The Wii Heart Fitness study is a three-arm clinical RC including 12 weeks of supervised laboratory-based moderate to vigorous physical activity followed by 6-months follow-up.

Setting: Brown University affiliated hospital research lab.

Period: Data were collected from January 2012 to September 2017 and analyzed in 2018.

Study population

To collect participants the following steps have been followed:

1. The researchers spread online advertisements on various websites and local radio stations, and flyers in local retail outlets.
2. Ads requested "generally healthy adults" who did not exercise regularly and were interested in healthier lifestyle.
3. Repliers were screened for eligibility, eligible individuals attended in-person orientation session, provided written consent, those consented individuals attended a second visit to complete baseline assignments, and to receive randomization assignments.

4. Participants were randomized into a 12-week program of one of the three categories (see further below)

Eligible participants had the following criteria:

- >18 years
- Currently participating in <60 minutes of moderate or 30 minutes of vigorous PA per week
-
- Willing to commit to the demands of the study protocol

Exclusion criteria:

- BMI >40
- Current or planned pregnancy
- Recent hospitalization (>6 months)
- Recent (>6 months) hypertension, cardiovascular or pulmonary disease, diabetes, and orthopedic conditions that interfere with PA
- If individual uses EVG at home

Measures

Participants randomized to EVG arm:

12 weeks of 50-minute EVG sessions, held three times a week. Each session included 5- to 10 minute warm-up and cool-down, and approximately 40 minutes of moderate- to vigorous-intensity exercise.

Participants in standard exercise program:

Attended sessions in a lab that was equipped with treadmills and stationary bicycles. Sessions are 50 minutes, including warm-up and cool-down.

Control participants:

Weekly mail with print materials on health-related topics for 12 weeks. Materials included health-oriented books and printed pamphlets from reliable sources. They were also sent items, such as sun screen, stress balls, and hand sanitizers.

Main outcome measures

“The primary outcome was weekly minutes of moderate to vigorous physical activity at end of treatment, assessed at 3 and 6 months post-intervention by using self-report and accelerometer data. Health risk indices (e.g., HbA1c, lipids) were also assessed” (Bock et al., 2019).

Results

“Participants (N=283) had an average age of 46.2 ±13.5 years; 79% were female. At end of treatment, those in the exercise videogame arm engaged in 30 minutes/week more moderate to vigorous physical activity compared with standard exercise and 85 more minutes/week than controls (all $p<0.05$)” (Bock et al., 2019).

Conclusions

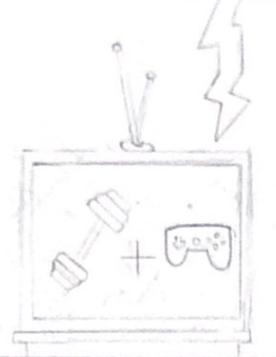
“EVGs produced greater uptake and maintenance of moderate to vigorous PA compared with standard exercise and improvements in multiple health risk indices. EVGs may promote sustainable physical activity with significant health benefits” (Bock et al., 2019).

HALF OF US ADULTS SELF-REPORT BEING SUFFICIENTLY PHYSICALLY ACTIVE. HALF OF THEM ARE NOT



INTRODUCTION

THEREFORE THERE IS NEED FOR EFFECTIVE APPROACHES TO ENCOURAGE PHYSICAL ACTIVITY



The Next Day



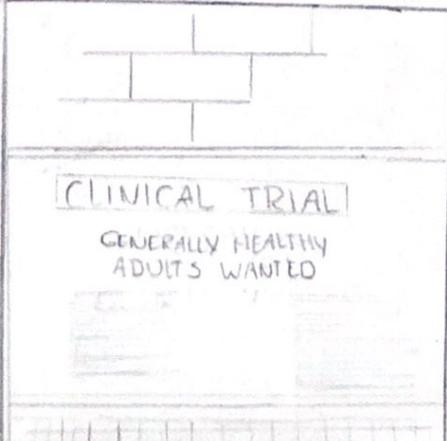
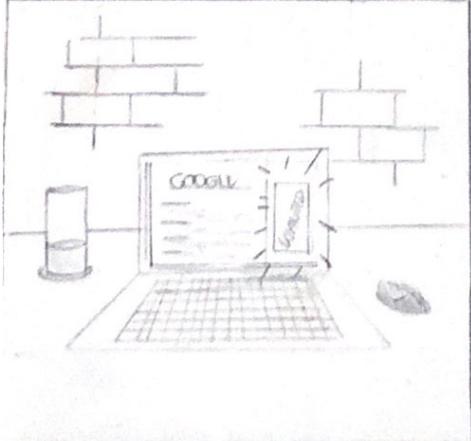
METHODS

WANTED RESEARCH PARTICIPANT

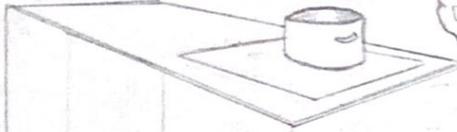
EXERCISE VIDEOGAMES: A RANDOMIZED CLINICAL TRIAL



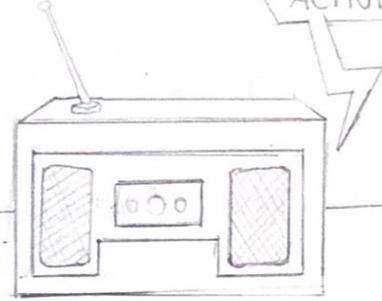
SOME HOURS LATER...



THAT EVENING...



CLINICAL TRIAL INCLUDES
12 WEEKS OF SUPERVISED
LABORATORY-BASED MODERATE
TO VIGOROUS PHYSICAL
ACTIVITY.



YOU KNOW
WHAT?
I WILL
PARTICIPATE

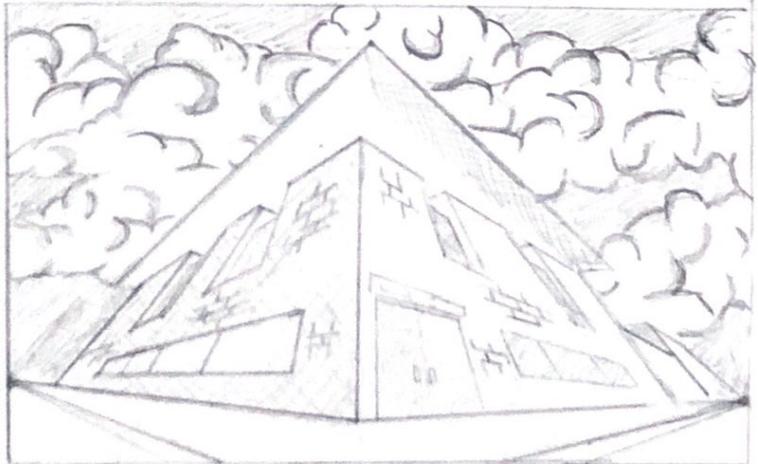


WHAT ABOUT
YOU RORY?
MIGHT BE
GOOD FOR YOU!

NICE TRY,
JIMMY!



Next Day
at the
Research
Lab...



GREAT! WE HAVE
PLENTY REGISTRA-
TIONS FOR
OUR TRIAL!



HOORAY! NOW
WE HAVE TO
SCREEN THEM
FOR ELIGIBILITY.



AFTER SCREENING, ELIGIBLES CAN ATTEND IN-PERSON ORIENTATION.



THAT'S RIGHT! WHAT WERE THE CRITERIA AGAIN?

CRITERIA PARTICIPANTS:
• > 18 YEARS
• < 60 MIN OF MODERATE PA A WEEK OR 30 MIN VIGOROUS PA A WEEK
• WILLING TO COMMIT TO DEMANDS OF STUDY PROTOCOL



AND WE CANNOT FORGET THE EXCLUSION CRITERIA!

EXCLUSION CRITERIA:
• BMI OVER 40
• CURRENT OR PLANNED PREGNANCY
• RECENT HOSPITALIZATION
(< 6 MONTHS)
• CONDITIONS THAT INTERFERE WITH PA
• WHEN INDIVIDUAL USES VIDEO GAMES AT HOME

JIMMY
AGE: 28
PA: 60 MIN MODERATE PA A WEEK
BMI: 30

I HAVE AN ELIGIBLE!

ALEXIS
AGE: 22
PA: NONE
BMI: 29

ME TOO!

ROBY
AGE: 25
PA: NONE
BMI: 43

THAT'S OK! BECAUSE THIS ONE'S!

I DON'T THINK THIS ONE IS ELIGIBLE

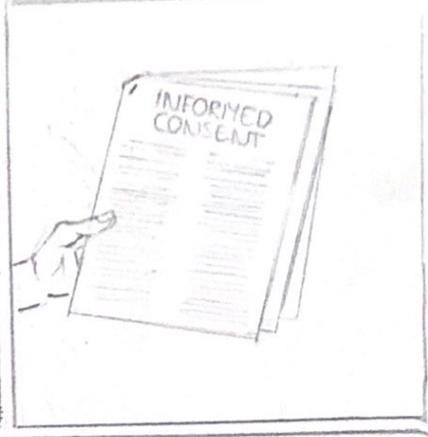
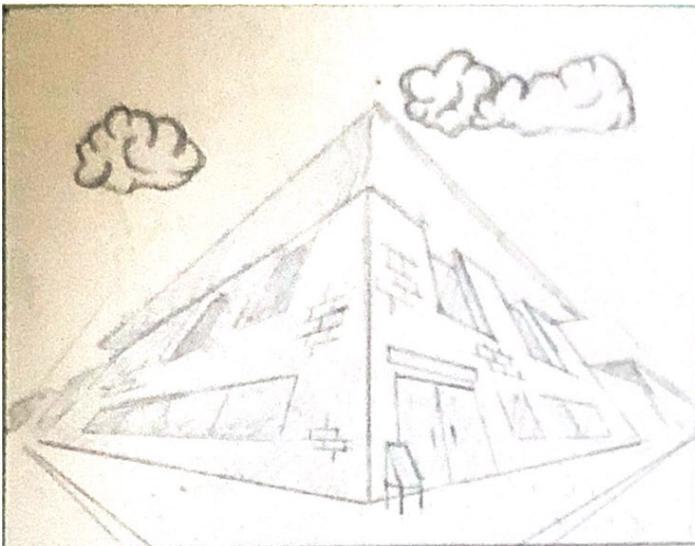
BARBARA
AGE: 43
BMI: 52



YES! ONTO THE NEXT PHASE. THE IN-PERSON ORIENTATION SESSIONS!

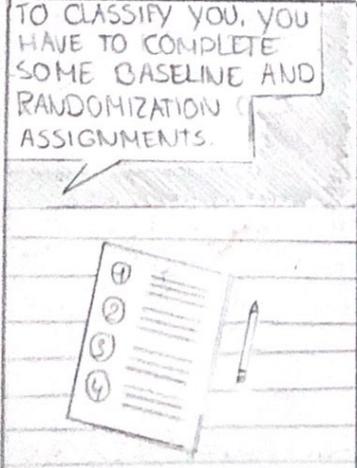
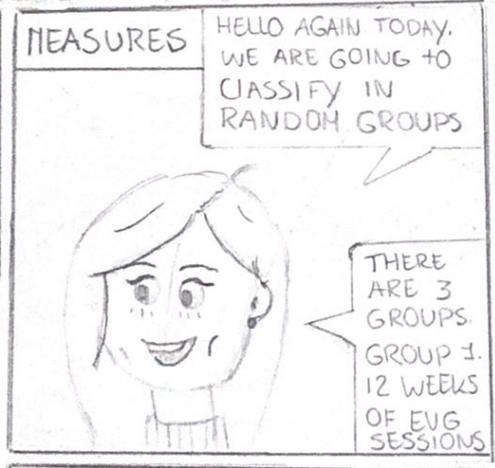
A Few Weeks Later..





Some Days Later...

AND GROUP 3 GETS A WEEKLY MAIL WITH HEALTH-RELATED TOPICS AND PRINT MATERIALS



EVERYONE IS
RANDOMIZED INTO
A GROUP. LET'S GO!



PROGRAM
GROUP 1:
12 WEEKS OF 50-
MINUTES EXERCISE
SESSIONS.
INCLUDING 5-
10 MIN WARM-
UP AND COOL
DOWN.

- HAVE
FUN!

A WEEK
LATER...

COOL!



USE THE WII
OR XBOX 360
KINETIC



The Day
After
Tomorrow..

PROGRAM
GROUP 2:
12 WEEKS OF
STANDARD
EXERCISE.
LAB INCLUDES
TREADMILLS
AND BICYCLES
SESSIONS
LAST 50
MINUTES



ALEXIS
LET'S
HOPE I
CAN KEEP
UP...

