Self Determination Theory-Based Exercise Program for Individuals with Intellectual Disability

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Introduction

Exercise is a subset of physical activity that is planned and structured with the explicit purpose of improving physical fitness (Oglesby et al., 2021). The recommendation for adults (18-64), including those with disabilities, is to engage in physical activity at a minimum of 150 minutes per week of moderate intensity (e.g., cardio and strengthening activities) and at least 2 days per week of vigorous physical activity (e.g., strengthening activities; *How Much Physical Activity Do You Need?* 2022). However, a number of individuals, including those with disabilities will choose not to engage in physical activity due to a lack of motivation (Teixeira et al., 2012). Motivation is defined as the quality of goal-directed behavior and is influenced by continuation, perseverance, initiation, and direction (Maehr & Zusho, 2009). Bodde and Seo (2009) reported a number of barriers, such as transportation, funding, support, and risk assessment/discouragement from others for safety reasons individuals may face when attempting to exercise (Bodde & Seo, 2009). Self-determination theory (SDT) focuses on studying human motivation and personality (Ryan, Soenens & Vansteenkiste, 2018). SDT identifies motivational forces as either intrinsic or extrinsic and believes that when an individual is provided autonomy, competence, and relatedness, motivation levels will increase (Teixeira et al., 2012). Teixeira et al, (2012) reported the types of instances when both intrinsic and extrinsic motivation within the exercise environment. For example, when a person engages in an activity to obtain a social reward they are extrinsically motivated as opposed to. When a person engages in physical activity for personal accomplishment and excitement, they are intrinsically motivated (Teixeira et al., 2012).

Method

Purpose of the Study

The purpose of this study was to determine the impact of the three major components of self-determination theory (autonomy, relatedness, and competence) within a structured exercise program on the exercise performance of an adult with a disability.

Subject

The participant was a 39-year-old male diagnosed with an intellectual disability (ID). The participant is highly responsive and verbal weighs roughly 245 lbs. and is 73 inches tall. On average the participant participates in physical activity at least 2 times a week and lifts weights at a gym at least one time per week. The participant has expressed his favorite physical activity is basketball.

Setting

The study was conducted in the Student Recreation Center (SRC) with accessibility to the field house and the gym at Cal Poly Humboldt. The field house provides an artificial turf area as well as direct access to the gym which includes machine weights, free weights, and a cardio section with ADA-accessible machines.

Dependent Variables

The dependent variable or outcome variables being measured within this study was the total walking distance performed within 6 mins, as well as the number of push-ups, and the number of sit-ups performed in separate 1-minute opportunities.

Independent Variables

The independent variable in this study was applying the SDT within this exercise program. Specifically, autonomy, competence, and relatedness. Autonomy was provided to the participant in the ability to choose their own goals. Competence was provided to the participant through consistent instruction and feedback provided by the researcher and relatedness was provided as the participant was placed in a gym setting with their same-aged peers who were performing similar exercises.

The Design

The study was conducted using a changing criterion design to evaluate the effects of a structured exercise program on increasing the walking distance, number of sit-ups, and number of push-ups for each participant. Implementing the changing criterion design provides substantial evidence of evaluating the effects of more than one treatment.

The Intervention

The intervention phase consisted of seven consecutive Friday evenings within the SRC. SDT was provided to the participant following data collection within the baseline phase. Each participant was provided the opportunity to select their own goals for the 6-min walk test. Additionally, participants were placed in the exercise environment, and the researchers began providing instruction and feedback to the participant.

Data Collection

The researcher recorded data after each assessment using a document to record weekly criteria of performance along with the number of laps, push-ups, and sit-ups completed. Each week, the criteria of performance would be adjusted to help increase the performance of the participant. As the participant would complete as many laps in the 6-minute walking test, the observer would make a tally for each lap the participant would complete to collect the data. During the 1 minute timer for push-ups and sit-ups, the observer would count aloud the number of push-ups and sit-ups the participant would be at. Below is an illustration of the data collection sheet used to record the participant's performance.

Results

This study utilized a changing criterion design over the course of 6 weeks. Following the SDT the participant was provided the opportunity to establish their exercise goals for total walking distance, as well as total push-ups and curl-ups completed within 1-min time frames. Below is a demonstration of the participant's performance across the 6-week time frame in meeting those goals.

Participant 1

The participant was a 39-year-old male diagnosed with an intellectual disability (ID). The participant is highly responsive and verbal weighs roughly 245 lbs and is 73 inches tall. During the baseline phase, the participant expressed a high level of excitement while engaging in the exercises. Prior to attending the program, they stated they previously participated in the engagement of physical activity at least 2 times a week with lifting weights 1 time a week. On average of using walking, push-ups, and curl-ups, the participant stated they used these as a form of exercises at least 0-2 days a week.

Baseline Phase

All baseline data were collected on the first day of the program. For the 6-min walk, the participant completed 8.5 laps. Additionally, the participant completed 15 push-ups and 32 curl-ups within the 1-min time frame. During the exercise portion of the baseline phase, the participant's heart rate (HR) was at a resting level of 59, and a peak level of 123. Despite these HR levels, the participant was unable to record any time at a moderate to vigorous HR level within the 90 min exercise program.

Criterion Phase 1

The participant was not present for data collection during this phase.

Criterion Phase 2

The participant was not present for data collection during this phase.

Criterion Phase 3

During criterion phase 3 the participant completed 9.5 laps within the 6-min walking test. Additionally, the participant completed 10 push-ups and 25 curl-ups within the 1-min time frame. During the exercise portion of criterion phase 3, the participant's HR was at a resting HR level of 59 and a peak HR level of 149. Finally, the participant maintained a moderate HR level for 4 of the 90 min exercise program.

Criterion Phase 4

During criterion phase 4 the participant completed 8.5 laps within the 6-min walking test. Additionally, the participant completed 15 push-ups and 25 curl-ups within the 1-min time frame. During the exercise portion of criterion phase 4, the participant's HR was at a resting HR level of 81 and a peak HR level of 132. Despite these HR levels, the participant was unable to record any time at a moderate to vigorous HR level within the 90 min exercise program. Below is an illustration of the participant performances across the 6-min walking test, push-up test, and curl-up test.

Figure 1

The Total Number of Laps Completed by the Participant

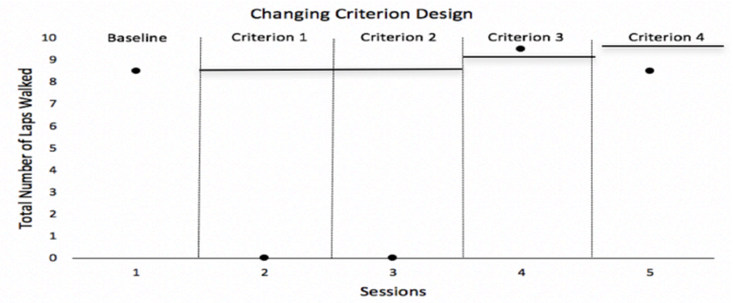


Figure 2

Total Number of Push-Ups Completed by the Participant

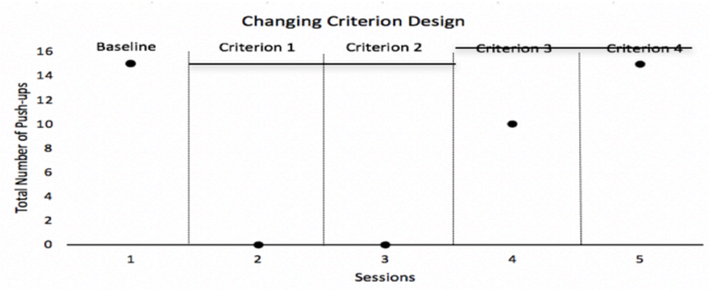
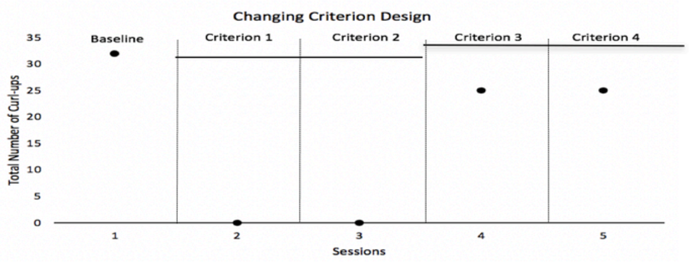


Figure 3

Total number of Curl-Ups Completed by the Participant



Discussion

Within a structured exercise program on the exercise performance of an adult with a disability, this study was implemented to determine the impact of the three significant components of self-determination theory(autonomy, relatedness, and competence). To this similar population, one study concluded that the self-determination theory has increased autonomous motivation in physical activity (Saebu et al., 2013). In different studies, the results concluded that there was mixed evidence and inconsistencies between the relations of specific SDT constructs and exercise (Teixeira et al., 2012). Given the framework of SDT in this study, our predictions were not as expected. Multiple variables of internal and external factors played into account and affected motivation for the participant through an exercise setting resulting in multiple limitations.

Limitations

While other findings reflected on the common barriers individuals with disabilities tend to face in generalized settings, this study focuses on the exercise setting. The general components adults with disabilities came across within the exercise environment are a lack of transportation, funding, support, and risk assessment/discouragement from others for safety reasons individuals may face when attempting to exercise (Bodde & Seo, 2009). In more depth, the limitations of this particular study resulted in the frequency and duration of how the program was structured being one time a week that included a warm-up and three sets of exercises: walking, push-ups, and cur-ups followed by an exercise program in the gym. The frequency and duration of a program play a factor in affecting the self-determination regulation of an individual. Throughout the length of the study, we taught participants to model correct behavior in which they are provided with the appropriate tools and skills to independently access the gym and the equipment. The number of participants only included one participant which had insufficient evidence. Despite this, there is substantial evidence that supports SDT across individuals, including individuals with disabilities. The model of SDT has increasingly become a basis for interventions in promoting physical activity and health promotion (Ryan et al., 2009).

Future Research

Future research using this program model should focus on increasing frequency, duration and the number of participants in the study. Nonetheless, fostering autonomy in the environment will promote self-determined exercise behavior (Puente & Anshel, 2010). In creating an environment in which self-determined type of regulation can be promoted and fostered will increase participation (Frederick, 2002). In recognizing the barriers individuals with intellectual disabilities face, future exercise programs and interventions should reduce the barriers such as lack of transportations, funding, support, and risk assessment/discouragement from others for safety reasons individuals may face when attempting to exercise individually or in a group.