A project entitled

Enhancing Parent-Child Relationship through Home Exercise Teaching Kit for Children with ASD

Submitted by

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Declaration

I, Wong Man Chi declare that this research report represents my own work under the supervision of Senior Lecturer II, Mr Chan Ching Yat, Roy, and that it has not been submitted previously for examination to any tertiary institution.

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Abstract

Purpose: This project aims to design a home exercise kit for children with Autism Spectrum Disorder (ASD) and their families, with the goal of enhancing their physical fitness, parent-child relationships, social communication, and interaction. **Methodology:** The exercise kit consists of three types of videos: individual, parent-child cooperation, and stretching, which are presented as daily workout videos and posted on Padlet. The kit is designed as a game with four levels, and participants must clear each level within one week. They can flexibly choose five days as exercise days and two days as rest days. Participants must follow the video to finish and record one of the exercises, then post the video on Padlet. They receive a number after finishing each video and collect a five-digit password to unlock the next level. Participants can give likes and comments to others' videos on Padlet. When they clear all levels, they receive the password to unlock a video database. Participants can also create their own Padlet and customize their personal exercise plan. **Results:** Six families were invited to try out the exercise kit, and they completed pre- and post-questionnaires. The results showed that ASD students and parents had insufficient exercise time per week. However, after participating in the project, they reported positive effects, such as increased motivation to exercise and enhanced communication skills. **Conclusion:** In conclusion, exercise therapy not only benefits ASD families' physical fitness but also their family relationships. This project provides an additional option for exercise therapy that is flexible in terms of workout venue and time.

Keywords: Autism, Home exercise, Parent-child relationships

Introduction

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental disorder characterized by severe difficulties in social interaction, communication, and behavior. In Hong Kong, the prevalence of ASD has been increasing, with a reported incidence of 5.49 in 10,000 children and a male-to-female ratio of 6.58:1 (Wong & Hui, 2007). According to the Hong Kong Census and Statistics Department (2015), the prevalence rate of persons with autism was 0.05 in 2007 and 0.14 in 2013, indicating a sharp increase in the population. This trend is not unique to Hong Kong, as the global and local prevalence of ASD continues to rise.

Insensee et al. (2022) informed that parents had high level of stress on caring for children with Autism, under COVID-19, school closure and lack of therapeutic support have increased parents' stress because those children are under normal circumstances thrive on structure and routine. Thus, children with Autism also responded to abrupt changes and disruption of routines with high level of anxiety or stress, which can negatively impact the parent-child relationship. Additionally, studies have shown that children with ASD tend to have lower physical fitness levels and lower participation in physical activity compared to typically developing children (Tyler et al., 2014; Pan, 2011).

Physical activity (PA) has been identified as an effective intervention to improve the emotion regulation and behavioral regulation of children with ASD (Tse, 2020). Esentürk (2021) also found that parents of children with ASD desire to participate in PA with their children in a home setting because it brings a positive effect on the development areas of their kids. Therefore, this project aims to design a home exercise kit for children with Autism Spectrum Disorder (ASD) and their families, with the goal of enhancing their physical fitness, parent-child relationships, social communication, and interaction.

By promoting regular physical activity, we hope to improve the overall well-being of children with ASD and their families and strengthen the parent-child relationship. The home exercise kit will be tailored to the specific needs and abilities of children with ASD, making physical activity more accessible and enjoyable for them.

Methodology

The exercise kit consists of three types of videos: individual, parent-child cooperation, and stretching. These videos are presented as daily workout videos and posted on Padlet. The kit is designed as a game with four levels, and participants must clear each level within one week. They can flexibly choose five days for exercise and two days for rest. This arrangement aims to provide choice to participants and enhance their motivation to exercise. Participants must follow the video to complete one of the exercises, record it, and then post the videos on Padlet.

To address the prerequisite of families with ASD, an online briefing is offered to participants before the game begins. The briefing introduces the functions of Padlet, the project's perspectives and gameplay, and provides guidelines and a demonstration of video uploading. We recognize that these families may find it difficult to control and effectively utilize electronic devices and online platforms.

ASD individuals have varying levels of physical ability, and therefore, a single level of physical activity may not be suitable for all. To cater to learning diversity and provide choices, each individual fitness video has two levels: fundamental and advanced. Participants can freely choose the level of each exercise depending on their abilities. Each exercise lasts for 20 to 30 seconds, followed by a 45-second break, and is repeated three times. After the

exercise, two stretching exercises will be performed. Daily exercises focus on training the upper limbs, core, lower limbs, and stretching.

A train sticker password sheet is designed and provided to participants. This design targets children with ASD who have stereotypical behavior and particular manners, enhancing their motivation to exercise. To meet the needs of children with ASD, visual cues have been applied in this project. For example, pictures of required equipment are provided as visual cues on Padlet, allowing children with ASD to follow the pictures to prepare for the exercise. The workout videos also offer a 10-second preview before each exercise, activating their working memory and minimizing verbal repetition.

At the end of each video, a code will be shown, and a five-digit password must be collected to unlock the next level. The operation of each level is similar, but the workout difficulty progressively increases. Once the participants clear levels 1 to 4, they will receive a password to unlock a video database. They can create their own Padlet and customize their exercise plan, with five categories of videos including upper limbs, core, lower limbs, parent-child cooperation, and stretching. They can use the "duplicate" function on Padlet to copy videos to their Padlet.

Participants are required to post their exercise videos on Padlet and can like and comment on others' videos to increase interaction between participants. They can also provide feedback and show appreciation in the comment area to enhance social and communication skills.

Result

Thirteen families completed a pre-questionnaire related to exercise habits and their parent-child relationships. Six families were invited to try out the exercise kit and completed both pre- and post-questionnaires.

The pre-questionnaire showed that 46.2% of parents never exercise with their children per week, 23.1% exercise with their children within 1 hour, and 30.8% exercise with their children for 1 to 5 hours per week. These results indicate that these families have less bonding time during exercise interventions. Parents of children with ASD experience stress in taking care of their children, with over 90% of parents indicating that the stress comes from their children's behavioral problems, emotional problems, and social interactions. This stress has a negative impact on their parent-child relationships. Approximately 70% of parents reported that while some home exercise references are offered to families with ASD, they are not good enough. They expect that teaching kits should be presented in teaching videos, with more than 80% of parents agreeing that this would increase motivation to exercise with children with ASD.

After joining this project, 66.7% of parents strongly agree, and 33.3% agree that it increases parent-child bonding time. 50% strongly agree and 50% agree that this project increases children's motivation to exercise. Moreover, 83.3% of parents strongly agree and 16.7% agree that this project has a positive impact on their parent-child relationships. Positive impacts have been observed on both ASD children and their parents, with both groups reporting that the project motivates them to exercise, enhances their fitness level and communication skills. Half of the parents reported that their stress was relieved, and some children with ASD

behavioral problems showed improvement. Overall, 100% of parents would recommend this project to other parents.

Evaluation

After reviewing the feedback from participants, there were some improvements identified in this project. Firstly, most families felt that the workout time was too long. Each daily workout video is around 25 minutes long. To address this concern, the videos can be adjusted into two parts: a compulsory part and an optional part. Participants must complete the compulsory part, but they can decide whether to do the optional part based on their ability and physical condition.

Secondly, parents reported that they do not have enough space to exercise at home. To address this concern, the workout routines can be adjusted to minimize the space requirement, especially for the parent-child cooperation part, which requires two people to work out simultaneously.

Thirdly, the workout videos can feature teenagers or cartoon characters as the demonstrators instead of PE teachers. Using teenagers as demonstrators can better conform to the age group of the participants, as they are easier to follow and feel more comfortable working with their peers. Additionally, using cartoon characters may increase participants' motivation because of the visual appeal.

Conclusion

In conclusion, exercise intervention not only benefits the physical fitness of families with ASD, but also strengthens their family relationships. This project provides a flexible option

for exercise intervention in terms of workout venue and time. Although the project idea was originally based on the COVID-19 pandemic, and now Hong Kong is gradually resuming normalcy, it is still suitable for children with ASD who may rely on familiar settings or cannot go out to exercise.

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