



Contents lists available at ScienceDirect

Disability and Health Journal

journal homepage: www.disabilityandhealthjnl.com

Improving food choices and nutrient adequacy in adolescents/young adults with developmental disabilities

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ARTICLE INFO

Article history:

Received 3 January 2017

Received in revised form

11 April 2017

Accepted 23 May 2017

A poster of this research has been presented at the Academy of Nutrition and Dietetic Association's Food and Nutrition Conference and Expo in 2015.

Keywords:

Obesity

Overweight

Nutrition education

Intellectual disability

Developmental disability

ABSTRACT

Background: Persons with intellectual and developmental disabilities (DD) have higher incidences of overweight and obesity than the general population and are currently underserved in health promotion programs. Restricted diets due to sensory sensitivity and physiological difference are often followed by persons with DD resulting in nutrient inadequacies, which may contribute to overweight and obesity. Closing the gap of healthcare disparities for persons with DD must start by increasing awareness of factors causing overweight and obesity, and development of strategies and programs to reduce incidences of overweight and obesity for persons with DD.

Objective: To investigate if implementation of an appropriately planned nutrition education program resulted in changes in food choices that improve the nutrient adequacy of the diet as a method of combatting or controlling incidences of obesity and overweight in persons with DD.

Methods: Pre-study, post-intervention questionnaires were administered to assess participants' nutritional needs, aid in program design, and evaluate program appropriateness. Parental group discussions and nutrition education lessons were conducted over a 6-week period. Three-day food logs were collected and analyzed pre-study and post-intervention using the National Cancer Institute's ASA24-2014 software.

Results: Results showed reductions of intake of fat, saturated fat, sodium, and sugar, and increases in intake of fiber, Vitamins A, C, and D, but there were no statistically significant differences from pre-study to post-intervention for any nutrient at the $p < 0.05$ level except cholesterol.

Conclusions: Qualitative data indicated program success; changes in nutrient intake were insignificant, supporting the need for further research in this area.

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Introduction

The United States has seen a dramatic increase in the prevalence of overweight and obesity over the past two decades.¹ Persons with disabilities have higher rates of overweight and obesity compared to the general population.² Adolescents and young adults with developmental disabilities (DD) aging out of structured educational settings and organized programs often fall through the cracks in obtaining preventive health promotion services. Persons with DD in the transitional phase of moving from one school system or services to adult services face numerous social, emotional, physical, and financial barriers that prohibit prevention and treatment of overweight and obesity.³

Restricted diets are often followed by persons with DD which

may result in nutrient inadequacy.⁴ The Adapted Physical Activity Lifetime Fitness program (APA) of West Chester University is a program providing health prevention strategies for individuals ages 17–26 with various developmental disabilities (DD).⁵ Nutrition is a crucial element of effective wellness programs. Prior to this study nutrition was not a component of the APA program. The focus of this study which introduced a nutrition education program was to answer the research question “What impact will nutrition education have in assisting persons with DD in making better food choices and improving nutrient adequacy as a method of combatting or controlling incidences of obesity and overweight?”

Methods

Participatory research methodology was used to assess the impact of the addition of nutrition education sessions to the APA program on improving the food choices and nutrient adequacy of

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<http://dx.doi.org/10.1016/j.dhjo.2017.05.003>

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participants as a means of combatting or controlling obesity and overweight in person with DD. The study was based on Bandura's social cognitive theory, indicating that learning and change can occur through observation, modeling of behavior, and positive reinforcement.⁶ The program design included participatory lessons incorporating observation and modeling of healthy eating from both the researcher and the program peers.

Participant selection

Criterion and convenience sampling were used in participant recruitment. Participants most available were those in the APA program meeting the criterion of having a DD and being active members of the APA program.

Qualitative data collection

Prior to the intervention a two-part home food behavior questionnaire (HFBQ) was developed and administered to parents and/or caregivers of participants to conduct an analysis of participants' dietary needs and habits. A field test for content validity was completed on the HFBQ to ensure the questions asked were clear, open ended, and in alignment with the overall purpose of the study. The questionnaire was sent to four experts for review: two in the field of nutrition, one in the field of special education and adapted physical education, and one in adapted physical education. Part-one of the HFBQ, based on parental self-reporting, was used to assess participants' nutritional requirements and status. The HFBQ explored parents' perception and knowledge of nutrition in relationship to their child's (study participant) eating patterns and behaviors. The questionnaires were analyzed and results were revisited in the group discussions to further explore and clarify the responses made in the initial survey. Group discussions with parents/caregivers were conducted and recorded over a 6-week period prior to the start of the intervention.

Quantitative data collection

Parents completed food logs pre-study and post-intervention, recording all food and drink consumed for a 3-day period. Instructions on completing the food logs were verbally explained, with detailed written instructions included in the food log document. Dietary data from each day of the 3-day food logs was analyzed using National Cancer Institute's ASA24-2014 nutrient analysis program. Averages of the 3 days were calculated for fat, saturated fat, cholesterol, sodium, sugar, fiber, and Vitamins A, C, and D. Quantitative statistical analyses of pre-study-post-intervention food logs were conducted on the results from the ASA24-2014 nutrient analysis using the SPSS version 22 data analysis software. Due to the small sample size and lack of normality of the data, the Wilcoxon Signed-Rank test was used to assess change. Nutrients examined for pre-study, post-intervention change included, fat, saturated fat, cholesterol, sodium, sugar, and Vitamins A, C, and D based on values per 1000 calories.

Intervention

Five nutrition lessons were developed utilizing the U.S. Department of Agriculture's (USDA's) MyPlate, designed to meet the participants' needs, based on relevant literature review and on parental input.⁷ Nutrition instruction immediately followed the exercise sessions. Parents participated in discussions on the weekly lesson while the participant exercised. The introductory session titled "Eat like an Olympian" used the Olympic rings to teach the five food groups to set the stage for the weekly lessons. Participants

were given their own plastic MyPlate for use at home as a visual aid and motivator. Each week featured a lesson and activity on a specific food group. Participants were given take-home food boxes, a corresponding activity, and standardized homework to be returned the following session.

Subsequent sessions started with the group "toasting to fitness" using "Ram Juice", a green drink containing a mixture of cherry juice, kale, carrots, and bananas, named after the University mascot. Homework from the previous week's lesson was reviewed prior to the introduction of the new weekly lesson. Lessons included interactive MyPlate activities including MyPlate Bingo, and MyPlate Buffet.⁸

Results

Data analysis criterion

Data analysis was limited to participants that attended all sessions and completed both pre-study and post-intervention HFBQ and 3-day food logs (N = 12).

Demographics

Participants had various disabilities, all were Caucasian with an equal gender distribution, and a mean age of 21.9. [Table 1](#) summarizes participant breakdown by disability ethnicity, gender and age.

Qualitative data analysis

HFBQ part-one

The HFBQs part-one were transcribed and analyzed, examining the nutritional needs, constraints, and eating habits of participants, as well as parental nutritional knowledge and concerns. The transcribed data were coded, and emerging themes were found using the Atlas.ti qualitative software program. Themes included: weight issues, healthy and unhealthy food intake, sensory or texture issues, physical limitations, special diets, and social challenges to healthy eating. Analysis of this data was shared with parents at the weekly group discussion to ensure the researcher properly interpreted their responses. Sharing this data served as a validation tool, allowing the researcher to check for accuracy of interpretation, and to provide an in-depth understanding of the parental responses of the part-one HFBQ.

HFBQ part-two and field notes

Part-two of the HFBQ and group discussion field notes were transcribed, coded, and themed. Part-two of the HFBQ contained questions to evaluate the program in terms of participant satisfaction, appropriateness of content, and recommendations for future program development. Coding of the data resulted in eight themes on positive program attributes and suggestions. The themes included: the power of learning in a social environment; weekly exposure to nutrition; introduction of new foods like Ram juice, acceptance of healthy eating due to group activities, value of the take-home recipes and homework, importance of repetition and reinforcement of material, introduction of cooking classes, and continuation of the current program. Responses indicated the weekly exposure to nutrition and healthy eating via the introduction to new foods in a peer setting were beneficial aspects of the program. Most the responses noted the benefits of learning in a social setting. Parents reported enjoying the group discussion and social interaction. The weekly "toast to fitness" using Ram Juice was

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