Piloting a Community-Based, Culturally Adapted Health Promotion Program for Children with Autism Spectrum Disorder and Developmental Disabilities in First-Generation Korean Immigrant Families

Esther Son and Sabretta Alford

Children with autism spectrum disorder and developmental disabilities (ASD/DD) face barriers to participation in health promotion programs due to the lack of available and/or affordable programs and trained staff at recreation centers. Children with ASD/DD in Korean immigrant families are one of the most underserved minority groups due to language, racial/ethnic discrimination, and stigma and shame within their own ethnic community. However, little research is available on development, implementation, and evaluation of a culturally adapted community health promotion program in this population. The purpose of this study is to assess effectiveness of a pilot program for children with ASD/DD from first-generation Korean immigrant families. The pilot study used a quantitative, quasiexperimental design (one-group design with pre- and posttest) following a seven-week health promotion program. We recruited 15 children with ASD/DD, ages nine through 16, from first-generation Korean immigrant families. The findings of the study suggest that the pilot program was effective in gaining nutrition knowledge and increasing physical involvement among participants. Given the fact that Asian immigrants are a fast-growing population and that nearly 75 percent of them were born abroad, development and evaluation of a community-based, culturally adapted health promotion program is urgently needed.

KEY WORDS: *children with autism spectrum disorder/developmental disabilities; first-generation Korean immigrant families; health promotion; prevention*

Overweight and obesity represent major public health problems for children and adults with autism spectrum disorder and developmental disabilities (ASD/DD) compared with the general population (Curtin et al., 2010; Egan et al., 2013; J. H. Rimmer et al., 2010). The majority of studies suggest that the risk for overweight/obesity is higher among children with ASD/DD (Hinckson et al., 2013; Matheson & Douglas, 2017; Zuckerman et al., 2014). For example, one of the principal features of ASD is habitual and stereotypic food preferences, which may lead to excess intake of saturated fats and refined sugars (Bandini et al., 2010; Hubbard et al., 2014; Suarez & Crinion, 2015; Zimmer et al., 2012). As children with ASD grow, they gain more autonomy in food choices and increased access to energy-dense snacks that can lead to overweight and obesity. However, choices in food repertoire (number of unique foods eaten) are difficult to change among children with ASD/DD, supporting the need for interventions early in childhood to increase the variety and promote healthy eating among children with ASD/DD (Bandini et al., 2010; Bandini et al., 2017).

The umbrella term "DD" originates early in life and refers to functional limitations in cognition and/or mobility and other independent living skills. Examples of DD include ASD, attention-deficit/hyperactivity disorder, seizures, cerebral palsy, Down syndrome, and intellectual disabilities (ID; Schalock et al., 2009). Children with ASD/DD also have lower fitness levels and higher rates of sedentary behaviors than those of typically developing children

(Golubović et al., 2012; Matheson & Douglas, 2017; J. H. Rimmer et al., 2010). The association between physical activity and wellness is well established in the general population, yet individuals with ASD/DD have difficulty maintaining the higher activity levels necessary to ensure a healthier life (Haveman et al., 2010; Lynch et al., 2022), and weight loss studies typically exclude children with ASD/DD (Matheson & Douglas, 2017). Nevertheless, previous studies show that increased physical activity in the ASD/DD population can have multiple positive effects on health and well-being. For example, increasing physical activity of children with ASD/DD can improve motor coordination (Memari et al., 2017), cardiovascular fitness (Menear & Neumeier, 2015), social behavior/interaction (Gregor et al., 2018; Huang et al., 2020), communication skills (Huang et al., 2020; Yarimkaya et al., 2017), and stress levels (Hillier et al., 2011). Huang and colleagues (2020) recently conducted a meta-analysis on the effects of physical activity programs on children and adolescents with ASD. Results indicated that physical activity programs had a favorable influence on social interaction, motor skills, and communication skills of adolescents with ASD. Other studies confirm that increasing physical activity participation in structured programs can positively impact social interaction and communication skills among children with ASD/DD (Hinckson et al., 2013; Srinivasan et al., 2014; Zhao & Chen, 2018). These findings highlight the critical importance of developing and evaluating health promotion programs for this population.

There are also programs targeting changes in physical activity and nutrition behaviors in overweight and obese children with ASD/DD (Hinckson et al., 2013; Suarez-Balcazar et al., 2016) that are shown to be more effective when they are customizable and culturally tailored. Hinckson and colleagues (2013) examined physical activity and nutrition interventions for overweight and obese children with ASD/DD. Twenty-two children and their families participated in a 10-week school-based intervention program in New Zealand. Data were collected at the beginning, at completion (post-1), and at the 24-week follow-up (post-2) and included level of fitness with a six-minute walk test, level of body fat using a standard waist measurement, and calculation of body mass index (BMI). Interviews with parents were used to measure nutrition changes and physical activity. After 24 weeks (post-2), researchers noted improved endurance among participants. In addition, 80 percent of parents reported that children reduced their consumption of sweets to once a week or less. Parents also noted fewer school absences related to illness, and teachers perceived that the participants were more active and aware of healthy food choices. These results suggest that children with ASD/DD and their families can make healthy diet and physical activity changes when encouraged. Recently, researchers explored novel interventions to promote health and well-being among children with ASD/DD. Healy and Marchand (2020) used a web-based, parent-mediated physical activity program to determine the feasibility and outcome of physical health education in children with ASD. The intervention program, Project CHASE, consisted of parents joining a private Facebook group where they were exposed to five intervention components. Parents completed a questionnaire measuring perceived effectiveness and engagement before and after the intervention. Results revealed that parents were satisfied or very satisfied with the intervention and that Project CHASE effectively supported their child's physical activity. Most participants actively engaged in reporting weekly goals, levels of physical activity, and information on physical activity opportunities. Many parents posted pictures of their child's activities. These findings suggest that web-based intervention programs can be valuable in promoting physical activities for children with ASD.

Despite the clear benefits of health promotion programs/interventions, however, children with disabilities are more restricted in their participation due to the lack of widespread availability of these types of programs (J. A. Rimmer & Rowland, 2008). Children with ASD/DD face various environmental and attitudinal barriers to maintaining a healthy lifestyle, which can put them at risk for overweight/obesity and chronic diseases as adults (Bandini et al., 2013; Matheson & Douglas, 2017; Suarez-Balcazar et al., 2016). These barriers to participation in health promotion programs are due to a combination of limited accessibility, lack of affordable programs, and untrained staff at recreation centers. These children may be less likely to join a community or recreational sports league or structured physical activity and nutrition program due to stigma and shame toward people with disabilities and their families in their community. Thus, they may have less opportunity to engage in physical activity and nutrition programs. Furthermore,

children with ASD/DD may prefer not to play with their neighbors or peers after school and on the weekends due to negative attitudes and discrimination toward people with disabilities. As such, it may require additional intervention to engage in social and physically active outlets (Matheson & Douglas, 2017).

While the need for interventions that promote healthy lifestyles in the ASD/DD population is increasingly clear (Hinckson & Curtis, 2013), it is less certain that these programs can be readily adapted to children from immigrant families facing challenges from cultural, language, and institutional barriers (Magaña et al., 2021). Asians are among the fastest-growing immigrant population in the United States, and they recently passed Hispanics as the largest group of new immigrants (Lee & Sheng, 2024). However, Koreans are only one of the top six ethnic groups of Asian immigrants (Lopez et al., 2015), indicating the complexities in studying lifestyle interventions in Asian subgroups with ASD/DD (Sritharan & Koola, 2019). Children in first-generation Korean immigrant families with ASD/DD are a largely underserved ethnic group. The prevalence of overweight in children with DD was almost five times higher compared with the general population in South Korea (Ha et al., 2010). Asian immigrant families face multiple barriers to participation in health promotion programs, including lack of time due to work schedules, lack of language proficiency, and shame and stigma within their community (Son et al., 2018). DD research, particularly for ASD research, has limited empirical evidence on the experiences and needs specific to racial/ethnic subgroups, despite evidence of racial/ethnic disparities in health outcomes (West et al., 2016). The study's focus on Asian subgroups is vital as extant literature often dichotomizes race (White vs. non-White) or presents Asian populations as a monolith. Therefore, the purpose of this study is to assess the effectiveness of a pilot program for children with ASD/DD from first-generation Korean immigrant families and to test the following two hypotheses: (1) Children with ASD/DD who participated in the health promotion program would reduce their weight. (2) Children with ASD/DD who participated in the health promotion program would gain increased nutrition knowledge. We modified, both culturally and linguistically, a health promotion intervention originally developed for Latino youth with disabilities and their families (Suarez-Balcazar et al., 2016), as well as a nutrition curriculum designed for teenagers (Bandini et al., 2013).

METHOD

Research Design, Participants, and Procedure

This pilot study used a quantitative, quasiexperimental design (one-group design with pre- and posttest). Fifteen children with ASD/DD, ages nine through 16, were recruited from first-generation Korean immigrant families who speak Korean at home and eat Korean food daily, and were provided with a seven-week health promotion program that included an hour-long nutrition education session and an hour-long physical activity session. The program started in October 2019 and ended in December 2019 at a community-based agency providing a wide range of information, support, and assistance to Korean immigrant families. The protocol was approved by the institutional review board of our university. The participants were recruited in collaboration with staff from a community-based agency in New York serving children with ASD/DD from Korean-immigrant families. Potential participants and their families received a letter of invitation explaining the project in detail. Signed informed consent was obtained from the participants' caregivers. An effort was made to ensure that each participant understood the project and actively chose whether to participate.

The ages of the participants ranged from nine to 16. Demographic characteristics are presented in Table 1. Most participants were male (80 percent) and had ASD (73 percent). The participants' mean age was 13 years old, height was 60 inches, weight was 113 pounds, BMI score was 22, and BMI-for-age was at the 66th percentile. Specifically, 33 percent of the participants had unhealthy weight (one overweight and four obese). The prevalence of overweight and obesity among the participants was similar to previous studies focusing on children with ASD/DD (Hinckson et al., 2013; Matheson & Douglas, 2017).

Program

The health promotion program consisted of a seven-week health and nutrition intervention modified from previously published research (Bandini et al., 2013; Suarez-Balcazar et al., 2016). Materials were modified culturally and linguistically by the research team, which consisted of the principal investigator, a social worker, social work student volunteers, a nutritionist, and a

Table 1: Description of Study Participants (N = 15)

Baseline Characteristic	*n*	%	*M* (*SD*)	Percentile
Gender				
Male	12	80		
Female	3	20		
Diagnosis				
ASD	11	73		
Down syndrome	3	20		
Intellectual disability	1	7		
Age (years)			13 (2.52)	
Height (in)			60 (5.50)	
Weight (lb)			113 (34.99)	
BMI			22 (5.31)	
BMI-for-age				66th

Notes: ASD = autism spectrum disorders; BMI = body mass index.

sports/yoga instructor (see Appendix for details about the program). The health promotion program was implemented as part of a free Saturday community-based program for children with ASD/DD. Participants met once a week for two hours. The facility is equipped with classrooms, a kitchen, and a large indoor gym, allowing for health and nutrition education and physical activity. Each of the seven sessions covered two components: nutrition education and physical activity. The program comprised one hour of health and nutrition education, focusing on children with ASD/DD only learning to make and eat a healthy snack, and one hour of physical activities, including warm-up, stretching, strengthening, conditioning, and basketball drills/yoga, led by a sports/yoga instructor. We introduced simple activities, progressed to complex ones, including those that were enjoyable, and utilized the individuals' interests and strengths when designing a physical activity program. Each session culminated with an educational discussion of healthy eating habits and moderate to vigorous physical activity. Several cultural adaptations were made to align with the target population's cultural norms. For example, we used a variety of culturally appropriate foods (i.e., Korean food) to introduce the "MyPlate" model and made healthy Korean snacks during the program.

Measures

Measurements at Baseline and Postintervention. Data were collected at baseline (preintervention) and at nine to 10 weeks (postintervention). Sociodemographic data for the participants were collected before the program. Preintervention data included children's height, weight, and BMI, and nutrition knowledge among children with ASD/DD. Participants' BMI and the corresponding BMI-for-age percentile were calculated based on Centers for Disease Control and Prevention (CDC, n.d.) growth charts for children and teens ages two through 19 years. Similar postintervention data were collected between nine and 10 weeks after the program began.

Outcome Variables. Children's weight status (BMI and BMI-for-age percentile) was measured before and after the program. As opposed to adults, weight status in children is categorized using age- and sex-adjusted percentiles, such that the overweight category encompasses children in the 85th–95th BMI percentiles, whereas obesity is defined as a BMI equal to or greater than the 95th percentile. We used the BMI Percentile Calculator for Child and Teen, which provides BMI and the corresponding BMI-for-age percentile based on CDC (n.d.) growth charts for children and teens ages two through 19 years. In order to assess the child's nutritional knowledge, a 12-item survey was used to test their understanding of MyPlate and healthy food choices, including culturally appropriate foods used in the program pre- and postintervention. MyPlate is a food guidance symbol and the latest nutrition guide from the U.S. Department of Agriculture (USDA) that is used in nutrition education in the United States. The graphic depicts a place setting with a plate and glass divided into five food groups (fruits, vegetables, grains, protein, and dairy) recommended for a healthy diet. Each food group includes a variety of foods and plays an essential role in an overall healthy eating pattern (Chang, 2017). The survey consists of 12 questions asking about the components of MyPlate and food group and healthy food choice quizzes (e.g., "What are the five food groups?"; "What should half MyPlate be filled with?"; and "There are many different kinds of protein foods. Which of these are not included in protein foods?")

Data Analysis

To examine the effectiveness of the health promotion program, the data were analyzed using SPSS (Version 25). Data analyses were performed using descriptive statistics and Wilcoxon signed-rank test

(i.e., a nonparametric test of the paired sample *t* test, since the sample size is under 100) in order to examine the changes in the outcomes. First, simple univariate descriptive statistics were conducted to describe the sample. Second, for unadjusted comparisons between BMI and levels of nutrition knowledge, at baseline and postintervention, we used Wilcoxon signed-rank test.

RESULTS

Each participant's BMI and nutrition knowledge were compared before and after the program. First, there were no statistically significant differences in BMI before and after participating in the program. Second, there were statistically significant differences in nutrition knowledge before and after participating in nutrition education sessions among participants. The posttest ($\mu = 58.87$, $SD = 10.87$) was statistically significantly higher than the pretest ($\mu = 31.60$, $SD = 20.65$), and the mean increase of 27.27 was found to be statistically significant ($p < .01$, $\alpha = .05$). This indicates an 86 percent increase in the mean nutrition knowledge among participants after participating in the program (see Table 2).

DISCUSSION

In this pilot program, 15 children with ASD/DD from first-generation Korean immigrant families significantly increased their nutritional knowledge after a brief seven-week health promotion program focused on healthy eating, increased physical activity levels, and reducing weight. The instructions and materials were presented to the children once a week over a two-hour period, where nutrition education took place during the first hour and physical activities in the second hour. BMI did not change during this brief health promotion program. However, the results show statistically significant increased nutritional knowledge after the program.

These results are similar to the findings of Hinckson et al. (2013), who performed a 10-week school-based intervention. Children with ASD/DD in that study similarly made healthier food choices and showed improved endurance in a six-minute walk test they used in their study. Interestingly, improved food choices were still observable after a 24-week follow-up period. The present study did not examine whether the increased nutritional knowledge was retained. However, the community agency staff reported anecdotes from the participants' parents about the positive impact of nutritional knowledge on their children's food choices at home. Further studies are needed to explore the long-term effects of nutrition knowledge on healthy food choices and overall health among the participants.

Presumably, this successful outcome was due in part to the cultural adaptations that were made to align the nutritional information with hands-on experiences in making healthy Korean snacks and food choices. In the nutrition field, there is a growing awareness of the importance of addressing a lack of representation of diverse foods as examples of healthy eating and a gap in culturally sensitive nutrition guidance. As such, the recently updated *Dietary Guidelines for Americans 2020–2025* (particularly "Guideline 2: Customize and Enjoy Food and Beverage Choices to Reflect Personal Preferences, Cultural Traditions, and Budgetary Considerations") emphasized meeting dietary recommendations while keeping cultural preferences in mind (USDA & U.S. Department of Health and Human Services, 2020).

Some limitations of this analysis should be noted. First, this study used a quasiexperimental design, which is a one-group design with a pretest and posttest. It can be used to determine, on a general level, how the program affects a particular group and is suitable for conducting a pilot study. However, the differences between the pretest and posttest could be due to many threats to internal validity (e.g., maturation, testing effects, and differential selection of research participants) rather than to the program. Also, there are possible covariates such as family (e.g., family rules for eating), culture (e.g., child's place of

Table 2: Descriptive Statistics and Wilcoxon Signed-Rank *t*-Test Results for Nutrition Knowledge ($N = 15$)

	Pretest		Posttest				
Outcome	***M***	***SD***	***M***	***SD***	**95% CI for Mean**	***z***	***df***
Nutrition knowledge	31.60	20.65	58.87	10.87	[–39.61, –14.93]	–2.99**	14

**$p < .01$.

birth, shame and stigma within their community), and school variables (e.g., accessible nutrition education in classrooms) that might have an impact on the outcome variables. Future studies should include covariates within a multilevel framework. Second, the sample was not randomly drawn from a population, so the difference between the pretest and posttest is not generalizable to the population from which the sample was drawn (Grinnell et al., 2016). Third, our small sample size limits our statistical power, and limited geographic location may reduce the generalizability of our findings. Fourth, the outcome variable was nutrition knowledge that can lead to an action (i.e., healthy food choices), so participants can act against their knowledge. However, this pilot study is a preventive health promotion program, and it is only possible to act with knowledge. Last, more information about Korean immigrant families' language/cultural indicators is needed. For example, there is no information on the child's place of birth that can affect their food preferences and choices. However, we recruited first-generation Korean immigrant families who speak Korean at home and eat Korean food daily, indicating cultural preferences in food choices and the need for culturally sensitive nutrition guidance. More detailed indicators are needed for future research.

Despite these limitations, the findings demonstrate the effectiveness of a culturally adapted health promotion program for underserved children with ASD/DD from first-generation Korean immigrant families. Studies focusing on the issues of overweight/obesity in children with ASD/DD are emerging. Past studies often focused on the relationship between age, sex, and overweight in children with ID (Bandini et al., 2005; De et al., 2008; Stewart et al., 2009). However, few studies focused on the interrelationship between other risk factors such as culture, parental factors (including socioeconomic and immigrant status), dietary intakes, and weight status among Asian children with ASD/DD (Choi et al., 2012). The present study aimed to deliver nutrition education incorporating a culturally sensitive approach to children with ASD/DD from first-generation Korean immigrant families. When more cultures are represented in nutrition education for children with ASD/DD, rather than using a standardized curriculum based on typical Western diet, we can connect with immigrant families more meaningfully. This sensitivity may lead to more effective changes in healthy food choices. Previous studies focusing on Latino and African American youth with disabilities and their families also emphasized that health promotion programs need to be culturally tailored to the community of interest (Suarez-Balcazar et al., 2013; Suarez-Balcazar et al., 2016). It is recommended that practitioners consider discussing potential adaptations with families, paraprofessionals, and agency staff who work extensively with the community (Suarez-Balcazar et al., 2016). In addition, as shown in Healy and Marchand's (2020) study, novel approaches to nutrition and exercise interventions are needed. Their use of a private Facebook group in a web-based intervention showed a timely approach in the social media age. Increased flexibility is necessary for studies of children with ASD/DD and their families. Furthermore, future studies will need to be undertaken to determine how these initial gains in nutritional knowledge can be extended over time.

Although participants' BMI did not change during this brief health promotion program, we observed a significant increase in physical activity involvement among them when we provided a structured physical activity program at a level comfortable for each individual. Also, we designed physical activity sessions where the intensity and duration of the exercise increased gradually over time to accommodate individuals' needs to improve cardiovascular endurance, strength, and flexibility. Many factors can work against efforts to increase physical activity levels in a family with a child with ASD/DD. In addition to parental time constraints, safety, and childcare considerations, many Korean immigrant families still feel the stigma and shame in simple activities, such as walking in the community with their child with a disability. Overweight/obesity prevention programs are not likely to be effective without understanding the prevalence and risk factors of overweight and obesity for children with ASD/DD, particularly among immigrant populations (J. H. Rimmer et al., 2010). Therefore, further examination is needed to explore children's risk factors, eating behavior patterns, and cultural risk factors that may influence the development of overweight and obesity (Choi et al., 2012).

CONCLUSION

The findings of this pilot study indicate the effectiveness of a culturally adapted health promotion program for children with ASD/DD in first-

generation Korean immigrant families. Asians are the fastest-growing population of new immigrants and comprise different ethnic subgroups, indicating the urgent need to develop, implement, and evaluate culturally adapted health promotion programs. The findings are encouraging, as they demonstrate that a brief culturally adapted health promotion program can make a difference in nutrition knowledge that can lead to healthy food choices and physical activity involvement. Future studies will need to be undertaken to determine how these initial gains in nutrition knowledge can be extended over time, as well as explore children's risk factors, eating behavior patterns, and other cultural variables that may influence the development of overweight/obesity and overall health. **HSW**

REFERENCES

Bandini, L. G., Anderson, S. E., Curtin, C., Cermak, S., Evans, E. W., Scampini, R., Maslin, M., & Must, A. (2010). Food selectivity in children with autism spectrum disorders and typically developing children. *Journal of Pediatrics*, *157*, 259–264. https://doi.org/10.1016/j.jpeds.2010.02.013

Bandini, L. G., Curtin, C., Fleming, R. K., Maslin, M. C., & Scampini, R. (2013). *Health U.: A nutrition curriculum for teenagers with intellectual and developmental disabilities*. CreateSpace Independent Publishing Platform.

Bandini, L. G., Curtin, C., Hamad, C., Tybor, D. J., & Must, A. (2005). Prevalence of overweight in children with developmental disorders in the continuous national health and nutrition examination survey (NHANES) 1999–2002. *Journal of Pediatrics*, *146*, 738–743. https://doi.org/10.1016/j.jpeds.2005.01.049

Bandini, L. G., Curtin, C., Phillips, S., Anderson, S. E., Maslin, M., & Must, A. (2017). Changes in food selectivity in children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *47*, 439–446. https://doi.org/10.1007/s10803-016-2963-6

Centers for Disease Control and Prevention. (n.d.). *BMI percentile calculator for child and teen* [Database]. Retrieved June 12, 2023, from https://www.cdc.gov/healthyweight/bmi/calculator.html

Chang, S. (2017, September 26). *Back to basics: All about MyPlate food groups*. https://www.usda.gov/media/blog/2017/09/26/back-basics-all-about-myplate-food-groups

Choi, E., Park, H., Ha, Y., & Hwang, W. J. (2012). Prevalence of overweight and obesity in children with intellectual disabilities in Korea. *Journal of Applied Research in Intellectual Disabilities*, *25*, 476–483. https://doi.org/10.1111/j.1468-3148.2012.00694.x

Curtin, C., Anderson, S. E., Must, A., & Bandini, L. (2010). The prevalence of obesity in children with autism: A secondary data analysis using nationally representative data from the National Survey of Children's Health. *BMC Pediatrics*, *10*, Article 11.

De, S., Small, J., & Baur, L. A. (2008). Overweight and obesity among children with developmental disabilities. *Journal of Intellectual & Developmental Disability*, *33*, 43–47. https://doi.org/10.1080/13668250701875137

Egan, A. M., Dreyer, M. L., Odar, C. C., Beckwith, M., & Garrison, C. B. (2013). Obesity in young children with autism spectrum disorders: Prevalence and associated factors. *Childhood Obesity*, *9*, 125–131. https://doi.org/10.1089/chi.2012.0028

Golubović, S., Maksimović, J., Golubović, B., & Glumbić, N. (2012). Effects of exercise on physical fitness in children with intellectual disability. *Research in Developmental Disabilities*, *33*, 608–614. https://doi.org/10.1016/j.ridd.2011.11.003

Gregor, S., Bruni, N., Grkinic, P., Schwartz, L., McDonald, A., Thille, P., Gabison, S., Gibson, B. E., & Jachyra, P. (2018). Parents' perspectives of physical activity participation among Canadian adolescents with autism spectrum disorder. *Research in Autism Spectrum Disorders*, *48*, 53–62. https://doi.org/10.1016/j.rasd.2018.01.007

Grinnell, R. M, Jr., Williams, M., & Unrau, Y. A. (2016). *Research methods for social workers: An introduction* (11th ed.). Pair Bond Publications.

Ha, Y., Jacobson Vann, J. C., & Choi, E. (2010). Prevalence of overweight and mothers' perception of weight status of their children with intellectual disabilities in South Korea. *Journal of School Nursing*, *26*, 212–222.

Haveman, M., Heller, T., Lee, L., Maaskant, M., Shooshtari, S., & Strydom, A. (2010). Major health risks in aging persons with intellectual disabilities: An overview of recent studies. *Journal of Policy and Practice in Intellectual Disabilities*, *7*, 59–69.

Healy, S., & Marchand, G. (2020). The feasibility of Project CHASE: A Facebook-delivered, parent-mediated physical activity intervention for children with autism. *International Journal of Disability, Development and Education*, *67*, 225–242. https://doi.org/10.1080/1034912X.2019.1597968

Hillier, A., Murphy, D., & Ferrara, C. (2011). A pilot study: Short-term reduction in salivary cortisol following low level physical exercise and relaxation among adolescents and young adults on the autism spectrum. *Stress & Health*, *27*, 395–402.

Hinckson, E. A., & Curtis, A. (2013). Measuring physical activity in children and youth living with intellectual disabilities: A systematic review. *Research in Developmental Disabilities*, *34*, 72–86. https://doi.org/10.1016/j.ridd.2012.07.022

Hinckson, E. A., Dickinson, A., Water, T., Sands, M., & Penman, L. (2013). Physical activity, dietary habits and overall health in overweight and obese children and youth with intellectual disability or autism. *Research in Developmental Disabilities*, *34*, 1170–1178. https://doi.org/10.1016/j.ridd.2012.12.006

Huang, J., Du, C., Liu, J., & Tan, G. (2020). Meta-analysis on intervention effects of physical activities on children and adolescents with autism. *International Journal of Environmental Research and Public Health*, *17*, Article 1950.

Hubbard, K. L., Anderson, S. E., Curtin, C., Must, A., & Bandini, L. G. (2014). A comparison of food refusal related to characteristics of food in children with autism spectrum disorder and typically developing children. *Journal of the Academy of Nutrition and Dietetics*, *114*, 1981–1987. https://doi.org/10.1016/j.jand.2014.04.017

Lee, J., & Sheng, D. (2024). The Asian American assimilation paradox. *Journal of Ethnic and Migration Studies*, *50*, 68–94. https://doi.org/10.1080/1369183X.2023.2183965

Lopez, M. H., Passel, J., & Rohal, M. (2015, September 28). *Modern immigration wave brings 59 million to U.S., driving population growth and change through 2065*. Pew Research Center. https://www.pewresearch.org/his

panic/2015/09/28/modern-immigration-wave-brings-59-million-to-u-s-driving-population-growth-and-change-through-2065/
Lynch, L., McCarron, M., Eustace-Cook, J., Burke, É., & McCallion, P. (2022). Physical health effects of sedentary behaviour on adults with an intellectual disability: A scoping review. *Journal of Intellectual Disabilities*. Advance online publication. https://doi.org/10.1177/17446295221107281
Magaña, S., Dababnah, S., Xu, Y., Torres, M. G., Rieth, S. R., Corsello, C., Rangel, E., Brookman-Frazee, L., & Vanegas, S. B. (2021). Cultural adaptations of a parent training program for families of children with ASD/IDD: Parents taking action. *International Review of Research in Developmental Disabilities*, *61*, 263–300.
Matheson, B. E., & Douglas, J. M. (2017). Overweight and obesity in children with autism spectrum disorder (ASD): A critical review investigating the etiology, development, and maintenance of this relationship. *Review Journal of Autism and Developmental Disorders*, *4*, 142–156. https://doi.org/10.1007/s40489-017-0103-7
Memari, A. H., Mirfazeli, F. S., Kordi, R., Shayestehfar, M., Moshayedi, P., & Mansournia, M. A. (2017). Cognitive and social functioning are connected to physical activity behavior in children with autism spectrum disorder. *Research in Autism Spectrum Disorders*, *33*, 21–28. https://doi.org/10.1016/j.rasd.2016.10.001
Menear, K. S., & Neumeier, W. H. (2015). Promoting physical activity for students with autism spectrum disorder: Barriers, benefits, and strategies for success. *Journal of Physical Education, Recreation & Dance*, *86*, 43–48.
Rimmer, J. A., & Rowland, J. L. (2008). Physical activity for youth with disabilities: A critical need in an underserved population. *Developmental Neurorehabilitation*, *11*, 141–148.
Rimmer, J. H., Yamaki, K., Lowry, B. D., Wang, E., & Vogel, L. C. (2010). Obesity and obesity-related secondary conditions in adolescents with intellectual/developmental disabilities. *Journal of Intellectual Disability Research*, *54*, 787–794.
Schalock, R. L., Borthwick-Duffy, S. A., Bradley, V. J., Buntinx, W. H., Coulter, D. L., Craig, E. M., Gomez, S. C., Lachapelle, Y., Luckasson, R., & Reeve, A. (2009). *Intellectual disability: Definition, classification, and systems of supports* (11th ed.). American Association on Intellectual and Developmental Disabilities.
Son, E., Moring, N. S., Igdalsky, L., & Parish, S. L. (2018). Navigating the health-care system in community: Perspectives from Asian immigrant parents of children with special health-care needs. *Journal of Child Health Care*, *22*, 251–268. https://doi.org/10.1177/1367493517753084
Srinivasan, S. M., Pescatello, L. S., & Bhat, A. N. (2014). Current perspectives on physical activity and exercise recommendations for children and adolescents with autism spectrum disorders. *Physical Therapy*, *94*, 875–889. https://doi.org/10.2522/ptj.20130157
Sritharan, B., & Koola, M. M. (2019). Barriers faced by immigrant families of children with autism: A program to address the challenges. *Asian Journal of Psychiatry*, *39*, 53–57.
Stewart, L., Van de Ven, L., Katsarou, V., Rentziou, E., Doran, M., Jackson, P., Reilly, J. J., & Wilson, D. (2009). High prevalence of obesity in ambulatory children and adolescents with intellectual disability. *Journal of Intellectual Disability Research*, *53*, 882–886.
Suarez, M. A., & Crinion, K. M. (2015). Food choices of children with autism spectrum disorders. *International Journal of School Health*, *2*, 1–5.
Suarez-Balcazar, Y., Friesema, J., & Lukyanova, V. (2013). Culturally competent interventions to address obesity among African American and Latino children and youth. *Occupational Therapy in Health Care*, *27*, 113–128. https://doi.org/10.3109/07380577.2013.785644
Suarez-Balcazar, Y., Hoisington, M., Orozco, A. A., Arias, D., Garcia, C., Smith, K., & Bonner, B. (2016). Benefits of a culturally tailored health promotion program for Latino youth with disabilities and their families. *American Journal of Occupational Therapy*, *70*, Article 7005180080. https://doi.org/10.5014/ajot.2016.021949
U.S. Department of Agriculture & U.S. Department of Health and Human Services. (2020). *Dietary guidelines for Americans, 2020–2025* (9th ed.). https://www.dietaryguidelines.gov/
West, E. A., Travers, J. C., Kemper, T. D., Liberty, L. M., Cote, D. L., McCollow, M. M., & Stansberry Brusnahan, L. L. (2016). Racial and ethnic diversity of participants in research supporting evidence-based practices for learners with autism spectrum disorder. *Journal of Special Education*, *50*, 151–163.
Yarimkaya, E., Ilhan, E. L., & Karasu, N. (2017). Investigation of changes in communication skills of an individual with autism spectrum disorder participating in peer-mediated adapted physical activities. *Ankara University Faculty of Educational Sciences Journal of Special Education*, *18*, 225–252. https://doi.org/10.21565/ozelegitimdergisi.319423
Zhao, M., & Chen, S. (2018). The effects of structured physical activity programs on social interaction and communication for children with autism. *BioMed Research International*, *2018*, Article e1825046. https://doi.org/10.1155/2018/1825046
Zimmer, M. H., Hart, L. C., Manning-Courtney, P., Murray, D. S., Bing, N. M., & Summer, S. (2012). Food variety as a predictor of nutritional status among children with autism. *Journal of Autism and Developmental Disorders*, *42*, 549–556.
Zuckerman, K. E., Hill, A. P., Guion, K., Voltolina, L., & Fombonne, E. (2014). Overweight and obesity: Prevalence and correlates in a large clinical sample of children with autism spectrum disorder. *Journal of Autism and Developmental Disorders*, *44*, 1708–1719. https://doi.org/10.1007/s10803-014-2050-9

Esther Son, PhD, MSW, *is associate professor, Department of Social Work, School of Health Sciences, College of Staten Island, City University of New York, 2800 Victory Boulevard, Staten Island, NY 10314, USA; email: esther.son@csi.cuny.edu.* ***Sabretta Alford, LMSW, MPhil,*** *is a PhD candidate in social welfare, Graduate Center, City University of New York, New York, NY, USA.*

Original manuscript received February 15, 2023
Final revision received June 13, 2023
Editorial decision July 24, 2023
Accepted July 24, 2023
Advance Access Publication March 19, 2024

APPENDIX: HEALTH PROMOTION PROGRAM

The program consisted of a seven-week intervention. Each of the seven sessions covered two components: nutrition education and physical activity. The program also comprised one-hour health and nutrition education, including children with autism spectrum disorder and developmental disabilities learning to make and eat a healthy snack, and one hour of physical activities, including warm-up, stretching, strengthening, conditioning, and basketball drills/yoga, led by a sports/yoga instructor. Each week we discuss a different theme. See outline of themes for nutrition education and related activities as well as physical activities in the following sections.

1. Introduction to the Program and MyPlate Model

- Theme: general overview of the program and introduction to MyPlate model
- Nutrition activities: discussion of "what is a healthy lifestyle?"; understanding definitions of nutrition, energy, variety, vitamins, physical activity, and exercise using flashcards and five food groups of the MyPlate model, with printed photographs of individual foods including Korean food; and healthy snack eating (i.e., baked Korean sweet potatoes called *goguma*)
- Physical activities: warm-up (basic stretches and conditioning: light jog from a baseline to baseline) and basketball drills (dribbling)

2. Vegetables and Fruit

- Theme: vegetables and fruit
- Nutrition activities: coloring pages and worksheets with titles and themes such as "Vegetables keep you healthy!"; "What's your favorite fruit?"; and "I SPY fruits & veggies"; healthy snack making (i.e., fruit platter consisting of Korean pears, persimmons, apples, and grapes)
- Physical activities: warm-up (basic stretches and conditioning: light jog from baseline to baseline, side-step) and basketball drills (dribbling)

3. Dairy and Drinks

- Theme: learn about limiting sugar consumption in drinks
- Nutrition activities: discussion on the benefits of calcium and methods to increase daily calcium intake and the benefits of water and methods to increase daily water intake; understanding the dairy/drinks food group of the MyPlate model, using printed photographs of individual foods, including Korean foods; healthy snack making (i.e., making healthy air-popped popcorn using fresh popcorn kernels)
- Physical activities: warm-up (basic stretches and conditioning: light jog from baseline to baseline, side-step, and knee touches) and basketball drills (passing)

4. Proteins and Fats

- Theme: learn about strategies for limiting fat intake through consumption of healthy proteins
- Nutrition activities: understanding the proteins food group of the MyPlate model, using printed photographs of individual foods, including Korean foods; healthy snack making (i.e., a wrap sandwich filled with turkey, lettuce, and tomato)
- Physical activities: warm-up (basic stretches and conditioning: light jog from baseline to baseline, side-step, knee touches, and cone running) and basketball drills (passing)

5. Grains

- Theme: learn about whole wheat grains and benefits for our diet
- Nutrition activities: understanding the grains food group of the MyPlate model, using printed photographs of individual foods, including Korean foods; rainbow eating chart coloring; and healthy snack making (*yubucho-bap*, a dish made with seasoned fried tofu pockets and rice)
- Physical activities: yoga with a yoga instructor

6. Eating Healthy Portions

- Theme: learn about eating healthy portions
- Nutrition activities: learn and sing a "healthy eating song"; healthy snack making (snowman cheese stick)
- Physical activities: warm-up (basic stretches and conditioning: light jog from baseline to baseline, side-step, knee touches, and cone running) and basketball drills (shooting)

7. Review of MyPlate Model and Five Food Groups

- Theme: review of MyPlate model and five food groups

- Nutrition activities: learn and watch a video clip titled *You Are What You Eat*; healthy snack making (bananas, oats, and chocolate rolled up in a whole grain wrap)
- Physical activities: warm-up (basic stretches and conditioning: light jog from baseline to baseline, side-step, knee touches, and cone running) and basketball drills (shooting)

Health & Social Work, 2024, 49, 105–114
https://doi.org/10.1093/hsw/hlae008
Article