

BRIEF REPORT

Nutrition needs assessment of young Special Olympics participants

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Abstract

Background Children with intellectual disability (ID) are at increased risk for obesity and nutrition-related health concerns, yet there is a paucity of data describing their nutrition status. The purpose of this study was to evaluate nutritional challenges of young participants (2–10 years of age) enrolled in Special Olympics Canada (SOC) programs.

Method A validated nutrition screening tool was mailed to 52 parents/caregivers of participants across 18 SOC programs in British Columbia, Canada.

Results Of the 29 (55.8%) questionnaires returned, 62.1% scored as “high” nutrition risk. Nutrition concerns included feeding (84.2%), oral motor (57.9%), and dental problems (26.3%), food allergies/intolerances (26.3%), constipation (15.8%), anaemia (10.3%), and diarrhoea (5.3%). Body mass index (BMI) for age data classified 16.7% of participants as overweight/obese and 22.2% as underweight.

Conclusions This study identifies some of the unique nutrition issues faced by children with ID. These data can help inform future ID health-related nutrition, prevention, and treatment programs.

Keywords: *nutrition, children, intellectual disability*

Introduction

Children with intellectual disability (ID) who also have chronic and complex health needs are at high risk for nutrition-related problems. Childhood obesity has become a global health concern and recent studies have demonstrated that children living with ID are at greater risk for being overweight and obese than peers without ID (De, Small, & Baur, 2008; Emerson, 2009; Lin, Yen, Li, & Wu, 2005; Lucas, 2010). Suboptimal nutrition can contribute to a decreased quality of life, increased risk for health issues and disease later on in life, as well as an increased cost of therapies and support (De et al., 2008; Emerson, 2009; Lin et al., 2005). Of the limited nutrition data available in children with ID (specifically Down syndrome), feeding problems and underdeveloped oral-motor development (Hopman et al., 1998) as well as suboptimal nutrient intake (Luke, Sutton, Schoeller, & Roizen, 1996) have been found.

Special Olympics Canada (SOC) is dedicated to enriching the lives of Canadians with ID through sport

(Special Olympics Canada, 2010). In 2008, SOC created two programs for young children: Active Start (AS) for 2–6-year-olds and FUNdamentals (FUN) for 7–10-year-olds. These programs promote basic motor and sport skill development, overall health, and social networking (Special Olympics Canada, 2010). Although recent studies have reported an increased prevalence of overweight and obesity in children with ID, there is a paucity of data describing the nutritional status of this population. Therefore, our study purpose was to assess and describe the nutritional status of children enrolled in SOC programs in order to better understand and inform the treatment and prevention of nutrition-related issues in this population.

Method

Participants

Between the months of January and May 2010, seven Special Olympic AS ($n = 35$ participants) and seven

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FUN programs ($n = 19$ participants) across British Columbia, Canada, agreed to participate in this study. Study materials (participant questionnaire and consent forms) were mailed to program coaches who then disseminated them to one parent/caregiver for each child participant. Written informed consent was sought from each child's parent/caregiver and ethical approval for the study was granted by the University of Victoria Human Research Ethics Board.

Instruments

A caregiver/parent of each SOC participant received the 20-item, validated Parent Completed Nutrition Screening Questionnaire for Children with Special Health Care Needs (Bujold, 1994; USC University Center for Excellence in Developmental Disabilities at Children's Hospital Los Angeles, 1999). Created and used by registered dietitians across North America, the questionnaire targets known nutritional risk factors most commonly seen in children with special health care needs such as body weight, feeding concerns, medical nutrition issues (use of feeding tube, diarrhoea, vomiting, and constipation), food security, supplementation, and medication use. Nutritional risk factors identified in the screening questionnaire are assigned points based on severity which are then used to calculate an overall nutritional risk score (Table 1).

Parent/caregiver-reported body weight and height were used to calculate body mass index (BMI) [weight (kg)/height (m)²]. Children were plotted on gender-specific BMI-for-age growth charts which classify individuals greater than the 95th percentile as overweight and between the 85th and 95th percentile as at risk of overweight (Centers for Disease

Control and Prevention [CDC], 2000). BMI was also compared to International Obesity Task Force (IOTF) cut-off criteria for overweight and obesity in children (Cole, Bellizzi, Flegal, & Dietz, 2000). A BMI-for-age less than the 5th percentile was used as the cut-off for underweight (World Health Organization Expert Committee on Physical Status, 1996).

A total of 29 ($n = 17$ AS; $n = 12$ FUN) nutrition questionnaires were completed (55.8% response rate). This represented children ranging in age from 2 to 13 years ($M = 6.2$; $SD = 2.3$ years) and with 72.4% being boys. The majority of children had Down syndrome (51.7%) as their primary medical diagnoses followed by autism (34.5%), Prader-Willi syndrome (3.45%), neurological disorder (3.45%), cerebral palsy (3.45%), and no response (3.45%).

Results

Of the 29 questionnaires returned, 18 (62.1%) participants, including 5 (27.8%) females and 13 (72.2%) males, had a score of 5 or more on the nutrition screening questionnaire. This group of participants would be classified as having a "high" level of nutritional risk with further assessment and referral to a registered dietitian recommended. A total of 9 (31.0% of total) participants (3 females, 33.3%; 6 males, 66.7%) screened scored between 1 and 4, indicating a "low risk" score, and 2 (6.9%) male participants scored 0, indicating a "no risk" score.

A summary of the common nutrition concerns found in children who had a "high nutrition risk" score is found in Figure 1. In children with "high risk" scores, feeding challenges (eating too much/little and refusing many foods) were the most commonly identified nutrition issue by participants (16; 84.2%). Participants with "high risk" scores also reported oral motor problems (difficulty chewing, swallowing, choking; 11; 57.9%), dental problems (5; 26.3%), food allergies and intolerances (5; 26.3%), constipation (4; 15.8%), anaemia (2; 10.3%), diarrhoea (1; 5.3%), and special diet practices (1; 5.3%). In addition, over half of these "high risk" participants (10; 52.6%) took medication, while 9 (47.4%) took dietary supplements.

Of the 29 total responses received, height and weight was reported in 18 participants. BMI-for-age (CDC classification criteria) revealed 2 (11.1%) participants were at risk for overweight (> 85th percentile), 3 (16.7%) were overweight (> 95th percentile), and 4 (22.2%) were underweight (< 5th percentile). Using IOTF cut-off criteria, 16.7% of participants were obese, with 0% as overweight (Cole et al., 2000). All participants classified in the aforementioned

Table 1. Nutrition screening scores and interpretation of nutritional risk

Nutrition screening score	Nutritional risk	Interpretation of the score
0	No risk	No immediate nutrition/medical action needed, child should be re-screened at least annually.
1 to 4	Low risk	Follow-up with parent/caregiver for the specific identified concerns and appropriate education and suggestions given if needed.
5 or more	High risk	Follow-up with parent/caregiver. Referral for further assessment with a medical professional as well as a registered dietitian is recommended.

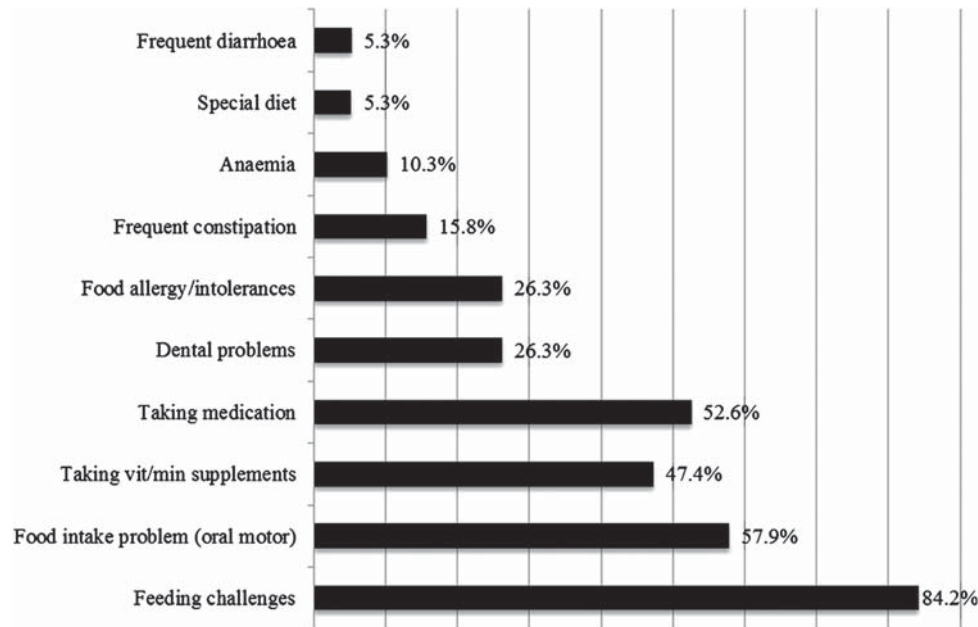


Figure 1. Nutritional concerns among high risk children (5 + score) on nutrition screening questionnaire (n = 18, males = 13, females = 5).

BMI-for-age classifications (overweight, underweight, and obese) were male. Parental/caregiver perspective of their child's weight was reported in all 29 participants and was described as "just right" (20; 69.0%), "overweight" (4; 13.8%), "underweight" (4; 13.8%), and "not stated" (1; 3.4%).

Discussion

This is the first known study to describe the nutrition status of young children enrolled in Special Olympic programs. The responses received from parent/caregivers demonstrated that the majority of children surveyed scored as a "high" level of nutritional risk, indicating this population of participants could benefit from further assessment with an appropriate medical professional (physician, speech language pathologist) as well as a referral to a registered dietitian (Bujold, 1994). Parents/caregivers of children with high risk scores reported feeding and oral motor challenges, including refusal of many foods, choking, difficulty chewing, food allergies, and dentition problems. Likewise, Hopman et al. (1998) found that there were significant delays in introducing solid food to children with Down syndrome, and that these children had underdeveloped oral-motor skills. This could be due to difficulties in mastication, fine motor control needed for using eating utensils, as well as parents providing a more baby-like menu to the child (Hopman et al., 1998). Feeding and

dentition problems that are left unresolved can lead to increased risk of poor weight gain, growth and development, aspiration pneumonia, and nutrient deficiencies (Bujold, 1994; Hopman et al., 1998; Lucas, 2010). As a high proportion of the children with high nutrition risk scores were reported to take both dietary supplements (41.4%) and prescription medication (34.5%), interactions may also interfere with food intake and nutrient absorption (Bujold, 1994; Lucas, 2010).

The prevalence of obesity and underweight found in the present study is consistent with what has previously been reported in the literature (De et al., 2008; Emerson, 2009; Lin et al., 2005; Lucas, 2010). Parents/caregivers indicated 17.4% of all participants had challenges with eating too much and 13.8% appeared as overweight. Depending on the classification approach used, 16.7% of participants could be classified as obese (IOTF) or overweight (CDC), with 11.1% at risk (CDC) for being so. These findings are consistent with those of Emerson (2009) who, using IOTF guidelines, reported a high prevalence of overweight (18%–17%) and obesity (8%–9%) in a group of children (3–5 years) with developmental delay (n = 440). Conversely, the rate of obesity in the present study is greater than the prevalence reported by Canadian population health data for children aged 2–5 years (6.3%) and 6–11 years (8.0%) (Statistics Canada, 2004). Obesity can contribute to a decreased quality of life, increased risk for health issues and disease, as well as an increased cost of therapies and support

(De et al., 2008; Emerson, 2009; Lin et al., 2005; Luke et al., 1996). The current results provide evidence that children with ID should be provided with the necessary nutrition support to encourage healthy eating and activity behaviours in order to reduce obesity/overweight-related health risks.

Contrary to the findings of obesity and overweight in the participants of this study, 22.2% of all participants in this study were classified as underweight based on BMI-for-age data. Comparative data suggest that this level of underweight is high. Between 1.5% (He & Evans, 2007) and 9.8% (Johnson-Down, O'Loughlin, Koski, & Gray-Donald, 1997) of Canadian children without an ID are underweight. Being underweight can negatively impact growth and development as well as increase the risk of nutrient deficiencies, which can contribute to health complications (Bujold, 1994; Hopman et al., 1998; Lucas, 2010). Only 13.8% of all participants were described by parents/caregivers as "underweight." This discrepancy between parental perspective and actual weight and height measures suggests a need for further support for parents of those with ID, as it is important that they be fully aware of their child's weight status and the health implications it could have.

Although the findings of this research provide valuable insight for the nutritional and weight status of children with ID, there are some notable limitations to this study. The generalisability of the results is one area of potential concern as children with ID from this research come from a nonrepresentative sample of the total population, of which a large majority of participants were boys (72.4%). Both procedural and response bias may have occurred due to remote dissemination of the study questionnaires. Further, BMI values were computed based on parent-reported height and weight, and not on verified measurement. Due to the small sample size, a comprehensive breakdown of results by age and gender was not undertaken. Future research would benefit from larger representative samples of children, as well as direct contact with Special Olympics programs to allow for direct measurement of anthropometry.

In conclusion, this study highlights some of the unique nutrition challenges faced by children with ID attending Special Olympics programs in BC, Canada. The majority of children surveyed had "high" nutrition risk scores and for this group of participants, feeding and oral motor challenges as well as drug/supplement food interactions can compromise nutrition intake and weight status. High rates of both underweight and obesity were found, placing children at increased risk for comorbidities. Considering the increased risk of suboptimal nutrition status in children with ID, the results from this study can be

used to inform individuals, treatment and prevention programs, future research, and the development of population-specific recommendations.

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Conflicts of Interest: None.

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