An Occupational Therapist Knows...

MATERNAL OBESITY LINKED TO CEREBRAL PALSY

OVERWEIGHT - 22% increased risk
• BMI: 25 - 29.9

OBESITY 1 - 28% increased risk
• BMI: 30 - 34.9

OBESITY 2 - 54% increased risk
• BMI: 35 - 39.9

OBESITY 3 - 202% increased risk
• BMI: 40+

"The extent of an Occupational Therapist’s knowledge is boundless. A profession that has a centric focus on Activities of Daily Living encompasses a plethora of things medical, psychological, emotional, educational, developmental, restorative, rehabilitative, and more. We combine this knowledge to serve our clients." - Dr. Frederick Covington
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THE 10 MOST OBESE COUNTRIES ON EARTH
According To The World Health Organization | % Obesity rate

United States of America 33.8%
New Zealand 26.5%
Australia 24.6%
Czech Republic 24.2%
United Arab Emirates 23%
Slovakia 23%
Norway 22.4%
Canada 22%
Germany 20.2%
Hungary 18.8%

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Overweight children are far more likely to become overweight adults than are children who maintain normal weight through adolescence.

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3 GOOD HABITS TO FIGHT AGAINST OBESITY

- Exercise
- Reduce intake of added sugars
- Eat clean

Water has no calorie and should be the first sources of hydration.

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- Dr. Frederick Covington
PHYSICAL ACTIVITY PATTERNS AND QUALITY OF LIFE OF OVERWEIGHT BOYS: A PRELIMINARY STUDY

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KEYWORDS
child; physical activity; quality of life

Summary
Objective: We compared the physical activity (PA) patterns and the quality of life (QoL) between overweight and normal-weight boys, and examined the relationship between PA and QoL of overweight boys.

Methods: Eighteen overweight boys (age range: 8–10 years, mean ± standard deviation: 9.36 ± 0.82 years) and 18 age-matched, normal-weight counterparts (age range: 8–10 years, mean ± standard deviation: 9.01 ± 0.65 years) participated in this study. All participants were in the 3rd or 4th grade. Each boy completed a QoL questionnaire and wore an accelerometer on his waist for a week to measure his PA during that period. Independent t tests were used to examine the differences in QoL and PA between the overweight and normal-weight boys. Paired t tests were used to test the differences in PA between weekdays and weekend days for each group. Finally, Pearson correlations were used to analyze the relationships between PA and QoL in overweight boys.

Results: Overweight boys reported a significantly lower QoL, and participated in significantly less PA on weekends than did normal-weight boys. A moderate and marginally significant correlation was found between PA on weekends and QoL in overweight boys.

Conclusion: Our findings suggest the importance of increasing weekend PA for overweight boys. Occupational therapists should encourage overweight boys to engage in PA that the boys are interested in on weekends, and conduct a PA program for overweight boys.

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Introduction

Overweight is an important health problem for children in many countries around the world (Sweeting, 2008). The high prevalence of overweight in children (one-third of children 6–19 years old in the United States [Ogden, Carroll, Curtin, Lamb, & Flegal, 2010], and nearly one-third of boys and one-fourth of girls in Taiwan [Chu & Pan, 2007]) has made overweight a major public health concern. Overweight children are likely to develop physical diseases, such as cardiovascular disease and type 2 diabetes, and encounter psychosocial issues, such as being teased and having low self-esteem, due to their weight (Puhl & Latner, 2007; Sweeting, 2008). Because occupational therapy is aimed at preventing future illness and improving the health and quality of life (QoL) of clients (American Occupational Therapy Association, 2007), the American Occupational Therapy Association has publicly addressed concerns about obesity and its prevention (Blanchard, 2006).

Occupational therapy plays an important role in weight management and related health concerns by helping clients engage in emotionally satisfying daily activities (Clark, Reingold, & Salles-Jordan, 2007). To provide interventions tailored to clients’ habits and preferences, it is necessary to analyze performance patterns related to daily life activities (Wilcock, 1998; Yerxa, 2002). Analyzing these activities in terms of energy expenditure, physical exertion, and physical activity (PA) is informative given the existing literature on the relationship between PA patterns and overweight.

The frequency, intensity, and duration of PA can be assessed by using subjective measures (e.g., self-reports) (Lazzer et al., 2003) and objective instruments (e.g., an accelerometer) (Hughes, Henderson, Ortiz-Rodriguez, Artinou, & Reilly, 2006; Treuth et al., 2007). The accelerometer has garnered growing attention because it can show PA patterns over a period of time to provide information on how intensely the participants were physically involved in what they were doing. Therefore, it can quantify PA over a combination of days (e.g., weekdays vs. weekends) without the bias of social desirability or the tendency to over-report PA (Treuth et al., 2007). In addition, accelerometers allow a detailed portrait of PA patterns by providing the minute-by-minute intensity of daily PA (Nader, Bradley, Houts, McRitchie, & O’Brien, 2008). For example, as an individual plays a 1-hour baseball game, an accelerometer records how many minutes of PA are light, moderate, or vigorous rather than counting that 1 hour as 60 minutes at the same intensity. By using these measures, research has indicated that overweight children engage in a lower level of PA and less daily moderate-to-vigorous PA (MVPA) than do normal-weight children (Deforche, De Bourdeaudhuij, D’hondt, & Cardon, 2009; Treuth, Hou, Young, & Maynard, 2005; Treuth et al., 2007). MVPA was specifically estimated because for PA to benefit health, it should be moderate or vigorous, and children need at least 60 minutes of MVPA per day (U.S. Department of Health and Human Services, 2008).

Because attending school is the major occupation of children 6 years old and older, their daily life activities are constrained by their school schedules. Therefore, children have different activities and PA patterns on weekdays and weekends (Saw, Nieto, Katz, & Chew, 1999). Only a few studies (Deforche et al., 2009; Treuth et al., 2005, 2007) in Western countries have examined the PA patterns of overweight children across weekdays and weekends. To the best of our knowledge, however, no published studies have examined PA patterns across weekdays and weekends in Asian countries, which may have activity patterns different from those in Western countries. For example, Taiwanese children spend less time on TV but more time on their homework compared with European-American and Mexican-American children (Chen & Kennedy, 2005). In addition, most children in Taiwan, Japan, and China go to cram school for a few hours after spending all day in public or private school (Lijima, Kondo, Koyama, & Higurashi, 1999; Lin & Huang, 2009; Liu, 2008).

Occupational therapy provides interventions for the management of overweight with the goal of improving clients’ QoL. QoL is a multidimensional construct defined as physical health, psychological state, personal belief, and social relationships; it reflects one’s self-perception of expectations and concerns in the context of the culture and its value systems (World Health Organization, 1993), and is useful for school contexts. It was found that a child’s weight (Hughes, Farewell, Harris, & Reilly, 2007; Williams, Wake, Hesketh, Maher, & Waters, 2005) and PA (Chen et al., 2005) are related to QoL. Overweight children report significantly lower QoL (Hughes et al., 2007; Williams et al., 2005) and have lower levels of daily PA (Patrick et al., 2004; Treuth et al., 2007; Trost, Kerr, Ward, & Pate, 2001) than do normal-weight children. In addition, overweight children with higher PA levels rated their QoL as higher than those with lower PA levels (Shoup, Gatsshall, Dandamudi, & Estabrooks, 2008). However, there is only limited published information on the relationship between QoL and PA on weekdays and weekends in overweight children. Therefore, the purposes of this study were to compare PA between overweight boys and normal-weight boys on a random week in the middle of the semester, and to estimate the relationship between weekday and weekend PA and QoL in overweight boys. Our findings may provide occupational therapists with information for intervention plans to improve QoL for overweight children.

Methods

Participants

We recruited healthy 8- to 10-year-old 3rd- and 4th-grade boys, a fairly homogeneous sample, for this study. Based on the recording of the body mass index (BMI) of the students in one elementary school in southern Taiwan, we invited 50 of their overweight and 50 of their normal-weight boys to participate in this study. All study participants and their parents provided appropriate written informed consent. The Institutional Review Board of National Cheng Kung University approved this study.

Instruments

Body mass index and body fat

Height was measured using a stadiometer, and weight and body fat were measured using a body fat monitor (UM014;
Tanita Health Equipment H.K. Limited, Kowloon, Hong Kong). BMI was calculated by weight in kilograms divided by the height in meters squared (kg/m²). Cole, Bellizze, Flegal, and Dietz (2000) and Sweeting (2008) suggest that the cutoff for overweight in a country should be based on its national population. Therefore, according to a national study in Taiwan (Chu & Pan, 2007), 8- to 9-year-old boys with a BMI above 19.3, and 9- to 10-year-old boys with a BMI above 19.7 are considered overweight.

**Physical activity**

We used an accelerometer (ActiGraph GT1M; ActiGraph, LLC, Pensacola, FL, USA) that has been reported (Corder et al., 2007) to be highly correlated with the Computer Science & Applications (CSA) Model 7164 ($r = 0.95$), an earlier model that was shown (Puyau, Adolph, Vohra, & Butte, 2002; Trost et al., 1998) to have adequate validity and inter-rater reliability. The accelerometer must be worn for at least 3 weekdays and 1 weekend day to yield valid data (Trost, Fite, Freedson, Sallis, & Taylor, 2000). The PA metabolic equivalents (METs) for children between 6 and 18 years old were derived using the Freedson equation (Freedson, Pober, & Janz, 2005): $\text{METs} = 2.757 + (0.0015 \times \text{counts/min}) - (0.08957 \times \text{age in years}) - (0.000038 \times \text{counts/min} \times \text{age in years})$, where counts/min were recorded using the accelerometer. PA must be $\geq 3$ METs to be considered as MVPA (Trost et al., 2001). Because of the different daily activities (Nader et al., 2008; Saw et al., 1999) between weekdays and weekends for school children, we used the following equation to represent minutes of MVPA in one week: $(\text{mean minutes of MVPA per weekday} \times 5) + (\text{mean minutes of MVPA per weekend day} \times 2)$.

**Quality of life**

The Pediatric Quality of Life Inventory 4.0 (PedsQL) is a modular instrument for measuring health-related QoL. This 23-item questionnaire asks the frequency of a problem’s occurrence during the previous month; the frequency is then transformed into a 0 to 100 scale according to the developer’s instructions (Varni, Burwinkle, Seid, & Skarr, 2003). Higher scores indicate a better QoL. Detailed information for the development, psychometric properties, and use of the PedsQL has been reported elsewhere (Lin et al., 2012; Varni et al., 2003).

**Procedures**

Participants were randomly divided into eight groups ($n = 5–7$ each), with each group having similar numbers of overweight and normal-weight boys. Each group was measured at different time points. One researcher measured the height, weight, and body fat, and calculated the BMI of the boys in each group at the beginning. The boys then filled out the PedsQL questionnaire in a classroom under the researcher’s supervision. All participants were asked to continuously wear the accelerometer on the right anterior pelvis from the time they awakened for 7 consecutive days—5 weekdays and 2 weekend days—unless participating in water activities such as bathing and swimming. Seven accelerometers were used in this study. A written version of these instructions was also given to the parents and teachers of the participants. After 7 days, the accelerometer was retrieved for data analysis.

**Statistical analysis**

The differences in demographics, QoL scores, and PA (on weekdays, weekend days, and during the 1-week PA accelerometer assessment) between the overweight and normal-weight boys were analyzed using two-tailed independent $t$ tests. PA on weekdays and PA on weekend days were compared using two-tailed paired $t$ tests for the overweight and normal-weight groups. The correlations between PA and QoL scores were analyzed using Pearson correlation coefficients adjusted by age for the overweight group. Significance was set at $p < .05$. All data were normally distributed, and all were analyzed using SPSS 16.0 (SPSS Inc., Chicago, IL, USA).

**Results**

**Participant characteristics**

A total of 49 boys (25 overweight and 24 normal-weight) agreed to participate in the study. All participants understood and completed the PedsQL questionnaires by themselves. Only 36 boys (18 overweight and 18 normal-weight) wore an accelerometer for at least 3 weekdays and 1 weekend day; the other 13 boys did not wear it long enough to permit analysis. The overweight boys were significantly heavier and had higher BMIs and higher body fat percentages than did the normal-weight boys (Table 1).

**Comparisons of PA and QoL between the two groups**

Overweight boys had lower QoL scores compared with normal-weight boys. Sixteen overweight boys (88.9%) and all normal-weight boys met the U.S. Department of Health and Human Services-recommended guidelines of more than 60 minutes of MVPA daily. However, the overweight boys had significantly fewer minutes of MVPA than did the normal-weight boys in a week, per weekend day, and after school on weekdays (Table 2). In addition, the overweight

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Participant Characteristics.</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Overweight boys ($n = 18$)</td>
</tr>
<tr>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Age (y)</td>
<td>9.36</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>138.23</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>47.80</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>24.80</td>
</tr>
<tr>
<td>Body fat (%)</td>
<td>32.48</td>
</tr>
</tbody>
</table>

BMI = body mass index; QoL = quality of life; SD = standard deviation.
boys participated in significantly less PA on weekends than on weekdays, whereas the normal-weight boys participated in approximately the same amount of PA on weekends and weekdays.

The trends of PA appeared to be similar between overweight and normal-weight boys on weekdays, especially during the school period (08:00–16:00) (Fig. 1). Both overweight and normal-weight boys had bursts of activity in the morning (10:00–11:00), at noon (12:00–13:00), and in the early afternoon (15:00–16:00) on weekdays. These three bursts contributed 31.2% of total MVPA in the overweight group (13.4% between 10:00 and 11:00; 10.6% between 12:00 and 13:00; 7.2% between 15:00 and 16:00) and 27% in the normal-weight group (10.6%, 9.8%, and 6.6%, respectively). In contrast, the weekend PA pattern was significantly (p < .05) different between the two groups: the overweight boys had less MVPA compared with the normal-weight boys, especially in the morning.

Figure 1  Weekday and weekend comparison of the minutes of MVPA from 8:00 to 22:00 in both groups. MVPA = moderate-to-vigorous physical activity.  

<table>
<thead>
<tr>
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<th>Overweight boys (n = 18)</th>
<th>Normal-weight boys (n = 18)</th>
<th>p</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>QoL score</td>
<td>81.04</td>
<td>10.85</td>
<td>89.67</td>
</tr>
<tr>
<td>Whole weeka (min)</td>
<td>735.15</td>
<td>270.32</td>
<td>938.71</td>
</tr>
<tr>
<td>Weekdayb (min)</td>
<td>113.19</td>
<td>38.46</td>
<td>136.70</td>
</tr>
<tr>
<td>At schoolb (min)</td>
<td>66.09</td>
<td>19.87</td>
<td>72.85</td>
</tr>
<tr>
<td>After schoolc (min)</td>
<td>41.23</td>
<td>27.14</td>
<td>58.05</td>
</tr>
<tr>
<td>Weekendc (min)</td>
<td>84.61</td>
<td>54.67</td>
<td>127.60</td>
</tr>
<tr>
<td>p</td>
<td>.016</td>
<td>.630</td>
<td></td>
</tr>
</tbody>
</table>

SD = standard deviation.

a Whole week = total minutes of MVPA in a week; weekday = mean minutes of MVPA per day on weekdays (24 hours); weekend = mean minutes of MVPA per day on weekend days (24 hours).

b At school = 8:00 to 16:00; after school = 16:00 to 22:00.

c Comparison between weekday and weekend MVPA.

Correlations between PA and QoL in the overweight group

Partial correlation was used because moderate correlations between age and PA (r = -.54 on weekdays and -.42 on weekends) and between age and QoL (r = .31) were found in our data. After controlling for age, the correlation for the overweight group between weekend MVPA and QoL total score was moderate (r = .47) and marginally significant, (p = .06), but did not reach the significant level. Overweight boys with higher PA levels on weekends had higher QoL scores. However, the correlation between weekday MVPA and QoL total score (r = .11, p = .62) was low and nonsignificant for the overweight group.

Discussion

This study compared PA patterns between overweight and normal-weight boys on weekdays and weekends, and investigated the relationship between PA and QoL for overweight boys. We found that overweight boys had lower PA levels than normal-weight boys after school on weekdays, on weekends, and for an entire week. In addition, overweight boys had lower PA levels on weekends than on weekdays. Moreover, the results indicated that overweight boys had a lower QoL than their normal-weight counterparts, and that overweight boys with more minutes of MVPA on weekends had a higher QoL.

Overall, our findings are in agreement with previous findings that overweight boys had lower PA levels than did normal-weight boys (Hughes et al., 2006; Lazzer et al., 2003), and that the difference in PA levels occurred mainly on weekends, not weekdays at school (Deforche et al., 2009; Treuth et al., 2007). Our findings suggest that the PA of both overweight and normal-weight boys was constrained by school activities, as evidenced by three bursts of MVPA on weekdays. The 10:00 to 11:00 PA included a required physical education period from 10:00 to 10:15 every weekday. The 12:00–13:00 burst was lunchtime, and most students played on the playground after having lunch. The 15:00–16:00 burst occurred because all the students were asked to clean up the campus from 15:00 to 15:20. The 10-minute breaks between classes were apparently not long enough for students to engage in PA other than walking to the restrooms or drink machines; they did not have to change classrooms.

The overweight boys in our study seemed to have more MVPA (105 minutes per day) than did the overweight children in previous studies (20–70 minutes per day) (Deforche et al., 2009; Ekelund et al., 2002; Hughes et al., 2006; Patrick et al., 2004; Shoup et al., 2008; Treuth et al., 2007; Trost et al., 2001) that used accelerometers (CSA 7164 or ActiGraph GT1M) to measure PA. One reason for the difference is probably related to the arbitrary cutoffs used to define the intensity of PA, such as MVPA defined as ≥2000, ≥3000, or ≥3200 counts/min (Deforche et al., 2009; Hughes et al., 2006; Treuth et al., 2007). However, the Freedson equation (Freedson et al., 2005) used in this study should be appropriate because it adjusts METs by age and has been used in many population studies (Nader et al., 2008; Riddoch et al., 2004). Another reason for the
difference may be attributable to the younger age of the participants in our study (mean age: 9.4 years in the present study vs. 12.7, 11.4, and 10.6 years in previous studies [Patrick et al., 2004; Shoup et al., 2008; Trost et al., 2001]), because PA is reported to decrease with age (Nader et al., 2008; Riddoch et al., 2004). Finally, the physical education policy in the school that required all children to exercise from 10:00 to 10:15 may also have contributed to the higher PA levels in this study.

In contrast to the similar PA patterns of both groups at school, the overweight boys in our study spent less time than did normal-weight boys engaging in MVPA after school and on weekends. In addition, our results indicated that PA was lower on weekends than on weekdays for the overweight but not the normal-weight boys. The reason could be that overweight children tended to engage in more sedentary activities after school and on weekends, such as playing computer games and watching TV, than did normal-weight children (Deforche et al., 2009). Unlike PA, however, computer games and watching TV are not beneficial for children’s health (U.S. Department of Health and Human Services, 2008).

The benefits of PA for overweight boys may be inferred from our findings that the QoL of overweight boys was moderately and positively correlated with their PA on weekends. These findings are consistent with previous findings that participating in regular PA was positively related to QoL in children (Chen et al., 2005), and that overweight children who met PA recommendations had a higher QoL than those who did not (Shoup et al., 2008). Overall, these results suggest that PA is a positive contributor to QoL in overweight children. Examining the relationship between PA on weekdays and weekends separately, we extended previous findings (Chen et al., 2005; Shoup et al., 2008) by showing an association between weekend PA and QoL for overweight boys, which highlights the importance of weekend PA for overweight boys.

The reason for a correlation between PA on weekends and QoL in overweight boys might be that the boys could choose their preferred PA on weekends, in contrast to the scheduled, required PA at school. It is interesting to notice that, although the school physical education policy seems to increase MVPA, it appears not to contribute to a higher QoL for overweight boys. This may be because the physical education activities were not interesting to them or did not provide them any positive feelings of achievement. For example, they may get negative comments when participating in PA (Puhl & Latner, 2007). Further investigations are needed to identify factors moderating the relationship between PA and QoL, such as motivation and social support.

Clinical implications

Our findings emphasize the importance of weekend PA for overweight boys. Occupational therapists may use, for example, the Person–Task–Environment (PTE) model (Holm, Rogers, & Stone, 2008) to guide intervention programs. The PTE model focuses on the discrepancy between the client’s current and desired performance and suggests that occupational therapists design interventions to resolve the discrepancy by considering three domains: person, task, and environment. Interesting PA programs based on the preferences and abilities of overweight children should be designed, the weekend schedule of the children’s family should be considered, as should the different energy levels of students based on their weight (e.g., overweight, obese, and extremely obese) to better suit their needs. Parents may be encouraged to schedule outdoor activities with their overweight children or to let their children participate in some sports clubs. The coaches in these clubs may also be educated on how to design and grade sports or exercise based on children’s preferences and abilities (Mosley, Jedlicka, Lequieu, & Taylor, 2008).

In addition, one reason for the nonsignificant correlation between QoL and weekday PA might be that overweight children did not like their PA at school. Therefore, schoolteachers need to consider the preferences and abilities of overweight children; the PTE model may also be applied at school. Occupational therapists can provide schoolteachers with information about physical education activities that children are interested in and that can be incorporated into educational curriculums to increase energy expenditure (Mosley et al., 2008). For instance, fun-based skill learning, such as competitive activities that provide a positive experience, may motivate overweight children to engage in PA. In addition, it is important to help develop playgrounds at school with different intensities of age-appropriate activities to promote participation in PA that is meaningful to the students. Peers, teachers, and parents need to be educated about how to interact with overweight children as well. Positive comments made to overweight children about their athletic abilities can give them positive feelings about PA and motivate them to enjoy it.

Study limitations

A primary limitation of this study is the school policy of increasing students’ PA. Because we were unable to manipulate this school policy, the effect of attending physical education classes was not clear to us, and the association between PA and QoL on weekdays in overweight boys may thus be confounded. In addition, due to the cross-sectional design of this study, we could not examine the causality or temporality of the association. Finally, we recruited only 8- to 10-year-old boys and our sample size was small, which makes it difficult to generalize our results to a wider population of children.

Future research

Our findings suggest a number of paths for future research in the area of weight status, PA, and QoL. First, future studies can recruit a wider pediatric population, including both genders and a wider age range, to provide more information related to PA and QoL in overweight children. Second, because activities for children vary between holidays (e.g., weekends), vacations (e.g., summer or Chinese New Year), and school semesters (Saw et al., 1999), future studies may also examine PA patterns and the associations between PA and QoL in overweight children during these periods. The information would help occupational
therapists provide intervention tailored to the clients’ circumstances. Third, future studies may use both accelerometers and activity daily logs to understand the pattern of time-use by children for a whole week. In addition, we assume that the weak association between PA at school and QoL is because overweight children are not interested in school-mandated PA. It is important for occupational therapists to design PA programs at school that are tailored to children’s preferences and abilities and to examine the effectiveness of such programs on activity levels and QoL in overweight children. Finally, a larger-scale, more comprehensive investigation on childhood lifestyles (e.g., stress, dietary habits, and PA) and cooperation with people in different disciplines (e.g., dieticians) is important for improving our knowledge on childhood obesity and developing effective intervention programs.

Conclusion

The present study provides evidence that overweight and normal-weight boys engage in different patterns of after-school and weekend PA. Although our sample size was not large enough for a cross-sectional study, our finding of a positive correlation between weekend PA and QoL in overweight boys suggests the importance of weekend PA for their QoL. When providing intervention programs for overweight boys, occupational therapists should take into consideration their preferences, circumstances, and contexts to design activities that are interesting to and feasible for them (Clark et al., 2007). In addition, occupational therapists should encourage overweight boys to find PA they enjoy and, when they are not in school, to participate in activities that they are interested in on weekends and after school on weekdays, such as clubs and sports.

Acknowledgements

We thank all the boys who participated in this study, and the teachers who helped us recruit participants.

References


The experience of participation in everyday occupations for adults with obesity

Mary A. Forhan, Mary C. Law, Brenda H. Vrkljan, Valerie H. Taylor

Abstract

Background. Participation in occupations of everyday life, such as self-care, work, and leisure, contribute to health and well-being. Obesity has been shown to influence health-related quality of life, but it is unclear how obesity influences participation in specific occupations. Purpose. To describe the lived experience of adults with class III obesity and the associated impact on participation in occupations of daily living. Methods. Ten adults enrolled in an obesity treatment program were interviewed. Data were interpreted using descriptive phenomenological methods. Findings. Participants underscored the tensions, barriers, and coping strategies across and within specific occupations. Although participation across occupations of daily living was described, the quality and diversity of occupations was influenced by real and perceived barriers within the environment. Implications. Participation in daily occupations is limited for persons with class III obesity. Intervention approaches should address health-related concerns and consider environmental adaptations that facilitate meaningful engagement in everyday life.

Résumé

Description. La participation à des occupations quotidiennes, comme les soins personnels, le travail et les loisirs, favorise la santé et le bien-être. La recherche a démontré que l'obésité exerce une influence sur la qualité de vie en matière de santé, mais elle n'a pas permis de déterminer clairement comment l'obésité influence la participation à des occupations spécifiques. But. Décrire l'expérience vécue par des adultes atteints d'obésité de classe III et les conséquences de l'obésité sur la participation à des occupations de la vie quotidienne. Méthodologie. Dix adultes inscrits à un programme d'intervention en matière d'obésité ont passé une entrevue. Les données de l'entrevue ont été interprétées à l'aide de méthodes d'analyses phénoménologiques descriptives. Résultats. Les participants ont souligné les tensions, les barrières et les stratégies d'adaptation présentes dans l'ensemble de leurs occupations et dans des occupations spécifiques. Bien que la participation à l'ensemble des occupations de la vie quotidienne ait été décrite, la qualité et la diversité des occupations étaient influencées par des barrières réelles et des barrières perçues au sein de l'environnement. Conséquences. La participation à des occupations quotidiennes est limitée chez les personnes atteintes d'obésité de classe III. Les méthodes d'intervention doivent tenir compte des préoccupations liées à la santé et des adaptations environnementales qui favorisent une participation significative à la vie quotidienne.


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Two percent of adults in Canada (approximately 484,000 Canadians) have a body mass index (BMI) of 40 kg/m², thereby meeting the criteria for class III obesity (Tjepkema, 2005). Class III obesity is linked to a number of health problems, including type 2 diabetes, cardiovascular disease, and sleep apnea (National Task Force on the Prevention and Treatment of Obesity, 2000). In addition, persons with obesity experience anti-obesity bias and stigma from employers, members of the general public, and healthcare providers (Puhl & Brownell, 2001; Wang, Brownell, & Wadden, 2004).

Participation in occupations of everyday life provides opportunities to connect with others, acquire skills and competencies, and is a means of finding a purpose in life (Law, 2002). Participation is recognized in the World Health Organization’s (WHO) International Classification of Functioning, Disability and Health (ICF) and is defined as involvement in a life situation (WHO, 2001). The domains listed under participation include general task and demands; mobility; self-care; domestic life; interpersonal interactions and relationships; major life areas such as work; and community social and civic life (WHO). Having information about the experience of adults with obesity in the domains of participation can inform occupational therapy practice for this population.

A review of the literature using the search terms obesity, participation in daily activities, and social participation yielded a large number of studies that explored the participation of persons in activities for the purpose of weight loss. One study explored the impact of obesity on social participation of older adults (mean age=71 years); however, the participants in the study did not meet the classification for obesity (mean BMI=26.1 kg/m²) and participation was defined as time spent interacting or being in the presence of other people (Zettel-Watson & Britton, 2008). Although results from this study imply that body weight was not a significant predictor of social interaction or direct contact with others, they do not contribute to our understanding of what it is like to participate in a range of occupations of daily living for adults with obesity. To our knowledge, there has only been one study of participation in the occupations of everyday living for persons with obesity. This qualitative study involved 72 persons with obesity, aged 16–72 years, and focused primarily on identifying socio-cultural factors that affect the lives of persons with obesity (Thomas, Hyde, Karunaratne, Herbert, & Komesaroff, 2008). Results from the study suggested that the majority of participants continued to participate in many of their daily activities. However, specific activities and the way in which participants engaged in these activities were not explored. Use of a framework to explore the impact of obesity on day-to-day activities might facilitate further understanding of those factors that can affect participation for this population.

The person-environment-occupation model (PEO), familiar to occupational therapists, illustrates the interaction of personal, environmental, and occupational factors that result in occupational performance (Law et al., 1996). The PEO model has been used to guide the identification and interaction of key factors that contribute to the participation experience of individuals (Law et al.). To date, the influence of personal and environmental factors on participation in self-care, work, and leisure for adults with class III obesity has yet to be explored.

The purpose of this study was to describe the experience of participation in the occupations of everyday life for adults with class III obesity undergoing treatment for obesity. Important personal and environmental issues that affect participation were explored using the PEO framework. This study was phase one of a PhD research project that used a sequential mixed methods design. The results of this study will be used to make decisions about the content of a cross-sectional survey to be conducted as the second phase of the project.

Methods

Approval for the study was granted by the McMaster University/Hamilton Health Sciences Research Ethics Board. Participants were not compensated for their participation in the study. Participants provided written consent witnessed by the administrative director of the treatment program.

Because the purpose of this study was to describe the experience of adults living with class III obesity, the tradition of descriptive phenomenology was selected as the most appropriate methodological approach. Specifically, this method, as explained by Giorgi (1985), was used to guide the line of inquiry and analysis for the purpose of describing participation in occupations and identifying factors that support or hinder participation.

Participants

Criterion-based sampling was used in the study. All participants had class III obesity, were involved in treatment for obesity, and were between 30 and 60 years of age. In order to describe the experience of living with obesity, participants needed to be aware that they had obesity. Therefore, treatment seeking for obesity was an important inclusion criterion. The age range was based on Erikson’s theory of human development, which describes the stage of middle-adulthood as having tasks associated with productivity, family and civil interests, and everyday life activities of interest (Edwards & Christiansen, 2005). This age range also includes the typical ages at which people seek treatment for obesity (Dalton, 2006).

Adults referred to an obesity treatment program in Ontario, Canada, were invited to participate in this study. The administrative director of the obesity clinic randomly selected 20 patients from the active patient list who met the study criteria and who had previously expressed interest in participating in research studies. Those who agreed to participate were then provided with an information sheet and consent form to complete at their next appointment. The researcher contacted potential participants by telephone after consent was provided to schedule the interview. The response rate to participate was 70% (n = 14).

Participants were interviewed by the first author at the obesity treatment program. This location was selected as it was convenient for the participants and provided seating in a private space that met the body size and weight requirements for participants.
Participant Demographics
Of the 14 participants who provided consent, 10 (female=7, male=3) scheduled interviews. Three participants declined to be interviewed due to challenges in finding a suitable date for an interview. One participant decided not to participate for reasons unknown. The BMI for each participant was based on recorded weight and height measurements taken within one week of the interview (mean BMI= 45.2 kg/m², sd=5.3). Participants had been enrolled in the treatment program for a minimum of one month (mean= 6.3 months, sd=3.7). The number of health problems (mean=5, sd=3.4) was identified from their medical records and were confirmed by each participant. The types of health problems included osteoarthritis, obstructive sleep apnea, type II diabetes, depression, mood disorders, and hypertension. All participants were Caucasian. The sample has a similar profile to adults with obesity in the general population in terms of gender and comorbid health problems (Tjepkema, 2005).

Data Collection
An interview guide was developed based on a review of current literature on obesity and also evidence related to the relationship between participation, health, and occupations of daily living. This guide was then pilot tested with three persons with obesity. Questions were framed broadly in order to obtain an overall description of the day-to-day experience of living with obesity (e.g., "Can you share with me how obesity affects your participation in the typical activities you do everyday?"). More specific questions followed in which participants were asked to identify activities in which they currently were involved (e.g., "What activities are you participating in at home and outside of the home?") and activities in which they wanted to participate but were not able (e.g., "Are there things you would like to do but don't?" “What prevents you from doing these activities?”). Interviews were recorded using a digital voice-recording device and transcribed verbatim. The interviews ranged in length from 40 minutes to 60 minutes.

Member-checking procedures were employed for the purpose of accuracy within the transcripts. Transcripts were printed and mailed to the appropriate participant for review, along with a stamped return envelope. Participants were asked to return their transcripts with comments and edits to the investigator within one week of receiving the transcript. The final analysis was based on data collected from all interviews. Member-checking procedures resulted in five transcripts returned with comments and edits that were entered by the researcher. Comments served to provide a more detailed description of participation in activities discussed during the interview. Edits were in the form of requests for details to be removed pertaining to family members or specific details about their employers they did not wish to include in the study. The edits did not alter the integrity of the data for the purpose of this study.

Data Analysis
Data were interpreted within the context of the researcher's views as an occupational therapist with experience working with patients who have class III obesity. Prior to analysis, and even before the collection of data, the assumptions of the first author were identified and recorded. The first author recorded these assumptions and other study observations in a reflective journal. Discussions with the PhD supervisory committee, colleagues in the area of obesity research, and students from other disciplines were helpful in highlighting the first author's assumptions.

The first author analyzed transcripts using descriptive qualitative analysis. The analytical method described by Giorgi (1985) guided the descriptive phenomenological approach. The first step of analysis involved reviewing each transcript in order to understand the overall experiences of living with obesity and associated challenges. The second step of the analysis involved identification of sections of the text that contributed to the description of what it is like to participate in daily occupations as an adult with class III obesity. Within each of these areas of inquiry, codes were identified by the first author. This process was completed with three interviews that were identified as representative of the range of descriptions in content, depth, and length and that would represent the diversity of data collected. The third step was completed using the same three transcripts. During this step, the first author transformed the description provided by the participants into the language used by occupational therapists to describe participation in occupations. Units of text and the corresponding transformation into discipline-specific language were organized into categories guided by the person-environment-occupation model (Law et al., 1996). Reflection and imaginative variation takes place at this step in an effort to retain the integrity of the participants’ description as it is translated into discipline-specific language. For example, a participant’s use of the phrase “tying shoes” may be replaced with “dressing lower extremity” without changing the description of the challenges associated with participating in self-care. An example of the analysis process is found in Table 1.

At this point in the analysis, the first author’s PhD supervisor repeated steps one through three for the purpose of confirming and expanding the identification of meaningful units and the transformation into discipline-specific language. There were no additional units identified as a result of this review. The remaining seven transcripts were then analyzed following steps one through three. In order to describe the essence of the experience of living with obesity, the description of participation in the occupations of everyday living was synthesized from data collected and transformed from all of the interviews with all of the participants.

Results
Data analysis resulted in the identification of three main themes, which each contained two sub-themes. All participants described the tensions associated with participation in daily occupations. Under this theme, subthemes included (1) choices related to occupation and (2) values about occupation. The second theme was barriers, which corresponded to (1) the built environment and (2) beliefs and attitudes. The third theme related to strategies to participate in everyday living utilized by the participants in order to participate in daily
All participants described a tension between what they wanted to do and what they were able to do. Tensions were caused by a disconnect between values, opportunities, and abilities.

### The Tensions Related to Participation in Everyday Living

All participants described a tension between what they wanted to do and what they were able to do. Tensions were caused by a disconnect between values, opportunities, and abilities.

#### Choices for participation in occupations of daily life.

All of the participants identified restricted choices for participation in every type of occupation. Activities such as shopping for clothes, joining a social club, planning a vacation, looking for employment, or volunteer work were put on hold for some participants who anticipated having more choices after losing weight. "I made excuses saying that after I lose the weight. But the more you go through the process [of losing weight] the more you think that you should have been doing this [living] a long time ago" (participant 8A). "I dream of going places everyday with my kids and taking them on vacation and not having to worry about everything because of my weight" (participant 11A).

Two of the participants had to leave their careers because they could no longer prepare for work, travel to work, or complete demands of their jobs. Six participants worked full-time in jobs ranging from desk-based office work to customer service positions in large chain stores. Two participants were full-time homemakers. Participants employed outside the home described restrictions in the range of activities they performed at work as a result of the pain, fatigue, and limited tolerance for mobility. Two participants perceived a belief that they were viewed as less capable by their employers compared to employees who do not have obesity. They noted that fewer demands were placed on them at work compared to their colleagues. In the work site . . . people looked at me when I was at 29/30 (BMI) and believed in me. But when I'm at 35 into the 40s (BMI), being 450 to 460 pounds, people would say they didn't know what I was talking about. (Participant 7A)

All participants had caregiving roles, including parenting and caring for grandchildren, an aging relative, and/or a spouse who required attendant care. The choices of activities within these roles were restricted in the range of available options.

### Table 1

Examples of the Analysis Process

<table>
<thead>
<tr>
<th>Main category: Tensions related to participation in occupations of daily living</th>
<th>Subcategory</th>
<th>Person</th>
<th>Environment</th>
<th>Impact on participation in occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choices related to occupation</td>
<td>- Pain. - Fatigue. - Feeling less valued. - Perceived loss of control to make choices.</td>
<td>- People stop coming to visit, invitations stop. - Others have low expectations of one's ability to perform. - Limited resources and supports to make choices.</td>
<td>- Restriction in the range of activities and the quality of participation.</td>
<td></td>
</tr>
<tr>
<td>Values about occupation</td>
<td>- Interested in participation. - Understimulated.</td>
<td>- Expectations from employers, family to be independent and in control.</td>
<td>- Participants describe a lack of meaning and satisfaction in the occupations they do.</td>
<td></td>
</tr>
<tr>
<td>Main category: Barriers</td>
<td>Built environment</td>
<td>- Unable to see foot beyond the abdomen. Limited tolerance for walking. - Body does not move easily or fit in seating or spaces.</td>
<td>- Narrow staircases and short depth of each step. - Seats not supportive of weight and shape attributed to obesity.</td>
<td>- The range and diversity of spaces in which to participate is restricted.</td>
</tr>
<tr>
<td>Beliefs and attitudes</td>
<td>- Perceived lack of value from others.</td>
<td>- Limit contact, do not make demands.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main category: Strategies to participate in everyday living</td>
<td>Attempting to persevere despite obstacles</td>
<td>- Motivated to participate.</td>
<td>- Expectations of others.</td>
<td>- Energy expended on necessary occupations. - Imbalance of occupations.</td>
</tr>
<tr>
<td>Supports</td>
<td>- Insightful. - Motivated to participate.</td>
<td></td>
<td>- Structured and planned occupation. - Limited spontaneity.</td>
<td></td>
</tr>
</tbody>
</table>
Most participants described feeling as though they were not good parents or grandparents because they could not move about in public places due to physical challenges and also for fear of embarrassment. These participants reported that they were not as active as they would like to be with their families.

With the kids, it takes a lot of effort, mentally as well as physically. I don’t do as much with them as I should or that I want to. The last couple of years we haven’t done a whole lot. (Participant 11A)

Options for leisure activities for participants were also limited by their obesity. Some participants described being members of families or social groups that enjoyed hiking, camping, or other types of physically demanding activities. The physical consequences of obesity restricted their ability to reach their desired levels of participation.

I’m starting to find that the things that I love and that I could do (are) getting harder. And it’s scary to think that, well, you’re almost waiting . . . what’s the next step? I don’t leave the house? I cut everything out? (Participant 1A)

My social life is very, very limited. It kind of evolved over the years because there was so little I could do and take part in, I think people stopped inviting you to. I think that was the other thing, and then you found excuses for not going because it was too difficult to do. (Participant 6A)

Participants described changes in their ability to perform self-care occupations, particularly bathing, eating, and bladder control. One participant stated that prior to her current weight, she enjoyed taking warm baths. Since the weight gain, she no longer has an option of having a bath.

I can’t get down into a bathtub and get back out. So I’m stuck with showers. It would be so lovely to sit and relax in a bathtub. So the enjoyment of something like that is gone. (Participant 3A)

Another participant described feeling that she had no control over her eating behaviour and looked forward to a time when she was able to eat for the purpose of providing her body with nutrients rather than for the purpose of coping with boredom, anger, or to celebrate. “I feel that before (the obesity) I ate to live and I feel today that I live to eat” (participant 1A).

Urinary incontinence was identified by most participants as an issue that limited their ability to engage in activities outside of the home. A male participant described this as an area that people with obesity are reluctant to discuss because it is “embarrassing.” He also stated that being a male and needing to sit down for urination created challenges in using public washrooms, which did not always have a seated option.

Several participants had experienced life at a lower weight. Having had the experience of participating in daily occupations at a lower weight provided a reference point of ability and choices. Participants compared and contrasted the experience of participation. There was a reflection on the restrictions on the choices of occupations that accompanied a weight increase. As weight loss occurs, options for participation in the areas of work, leisure, and self-care are realized until their weight increases again, and the options for participation change.

When I was at my highest [weight] I could do very little . . . each time that I lost weight I could see that I can do this [occupations] and get enjoyment out of it. So that is where it is frustrating if you put that weight back on over and over . . . (Participant 5A)

Values attributed to participation in occupations of daily life.

Participants identified the value associated with participating in occupations of daily life that included autonomy, feeling valued by others, and making a contribution to interpersonal relationships. Participants described an interest in being involved in social, recreational, and work-related activities but stated they would often opt out due to concerns about their inability to meet the expectations of others or the demands of the task. Most described avoiding social interactions that involved physical activities such as dancing, walking, and dining out due to concern that they were “slowing others down.” If the activity included food, they felt they were being scrutinized with regard to their portion sizes or menu choices.

Feelings of low self-esteem and body-image dissatisfaction were identified by most participants as reasons for avoiding sexual activity with their partners, despite their partners’ interest.

Barriers to Participation in Occupations of Daily Living

Barriers to participation in the environment were identified in the context of the built environment and the stigma associated with obesity in family, social, and healthcare environments.

The built environment.

The built environment was identified most often by participants as limiting participation in healthcare, recreation, and social activities. Specific barriers in the built environment included seating in cinemas, restaurants, airplanes, automobiles, or public transit that are too small for a person with obesity. Other barriers included parking spaces located far from entrances and poor access to elevators and stairs without adequate depth to each step. These barriers reduced participation in activities outside of the home.

Your mind is constantly thinking ahead. I find myself thinking about things like, oh my goodness, if I go to Wonderland with the kids what if I can’t fit in the rollercoaster. Or we’re going on a family trip, what if I don’t fit in the plane seat. I went snorkeling on a trip and I panicked. Did they have a life preserver that’s going to fit? I mean you’re mortified and you’re constantly thinking and because you’re constantly thinking there are things you won’t attempt to do because you’re just afraid that you’re going to totally embarrass yourself. (Participant 1A)

Most participants avoided dining out; visiting amusement parks; or traveling by airplane, public transit or in vehicles other than their own. One female participant described feeling as though she was taking up more physical space in public than she should and therefore avoided going out of her home.

I guess I’m more conscious of how much space I take up . . . You know you’re so smushed in here [public spaces] and feeling like you’re taking up more than your fair
share of space . . . people try to get away from you. (Participant 11A)

Seats on the Go Train, VIA Train are too small so I avoid travel. I need a seat belt extender to go into a friend’s car. (Participant 3A)

**Beliefs about and attitudes toward persons with obesity.**

Most participants had the perception that as their weight increased, their credibility in social and professional situations was negatively affected. “As you get bigger, a lot of people just doubt what you say” (participant 7A). Participants described experiences of public humiliation. Examples included needing to request seatbelt extenders on airplanes and company automobiles, incontinence due to pressure on the bladder, and limited access to narrow doorways in public washrooms.

Negative attitudes toward adults with obesity and beliefs about obesity are not limited to the general community. Participants described avoiding medical care for fear of being remanded by their family physicians because of their weight. Most stated that their primary healthcare providers never inquired about how they managed their day-to-day activities.

“I’m not going to the doctor for physicals. Before coming here I hadn’t gone since 2003. I avoided it because I didn’t want to go on the scale . . . she’s [the doctor] going to tell me I’ve got to lose weight, and I will say I know I have to lose weight but you tell me how. (Participant 5A)

I think that what is the missing piece in all of these [visits with the doctor] is that no matter what point in the process [of weight loss] you are, what are you going to do in between [visits]? Ask what do you want to do? How do you want to feel? (Participant 8A)

Instead, they were routinely told to eat less and be more physically active for the purpose of losing weight. There are times I did not want to go to the doctor. You dread the scale. I didn’t want to hear the same thing again [you need to lose weight]. (Participant 6A)

**Strategies to Participate in Everyday Living**

Despite limitations, all participants described using strategies to enable themselves to participate in everyday activities and to cope with the social, psychological, and physical consequences of having obesity. Strategies included persevering despite obstacles and utilizing physical and emotional supports.

**Persevere despite obstacles.**

Participants engaged in a variety of occupations of daily living, including bathing, dressing, household chores, paid employment, care giving, and leisure pursuits. They described requiring more time to do these activities as compared to a non-obese person. They accommodated to the challenges through frequent breaks and prioritizing tasks, doing only what they felt needed to get done first.

“I am active and get things around the house done. They just take longer. I get out of breath and I don’t like feeling that way. (Participant 12A)

I would be happier if I lost weight. I would do the same things I do now but they would be easier and I would feel more comfortable. (Participant 5A)

Accomplishing tasks was driven by an internal pressure to prove to others that they can work (paid or unpaid) despite the obesity. This work was often done at the risk of injury, increased pain, or fatigue.

“I think I try to overcompensate because constantly in the back of my mind I’m not going to lie down to it [obesity]. I’m not going to become obese and totally lazy. I find I am constantly struggling with overcompensating, even at the risk of flaring my arthritis. (Participant 1A)

Most participants described trying to integrate prescribed physical activity into their daily routines as part of the treatment for obesity. Despite feeling anxious in public places or self-conscious in fitness environments, they did try to be as physically active as possible.

Going to the gym is anxiety provoking. I feel as if everyone is staring at me . . . I am bigger than everyone around me. I feel very isolated at the gym but I go anyway because I need to. (Participant 8A)

Participants who were working outside of the home described doing what they needed to do to meet job requirements. In order to have the energy to complete work tasks, participants stated that they organized their day to minimize walking, and often declined work-related social activities or optional offsite meetings.

**Access to environmental supports.**

Participants identified physical and emotional supports. Physical supports included assistive devices or physical accommodations in environments where participation takes place. Emotional supports included verbal encouragement or a source of empathy and understanding from others.

Physical supports, such as canes, walkers, scooters, and carts, were used by less than half of the participants. When asked specifically about the use of assistive devices, most participants stated that they would prefer not to use them or did not see the point of purchasing devices that they would no longer need once they lost weight. Two participants requested help from family members to tie their shoes. Most participants found other ways to dress their lower extremities by avoiding lace-up shoes, not wearing socks, or wearing a long skirt to avoid the need for pantyhose. In the areas of self-care, participants described levels of effort and energy consumption required for showering, drying off, and dressing that caused them concern. In order to make it to work on time, many participants needed to start their day 2–3 hours before work to complete self-care.

Conserving energy, planning ahead, and surrounding one’s self with supportive individuals were strategies they identified to enable participation in everyday living. All participants identified people in their family or social network that encouraged participation in day-to-day activities. Their support networks were available to talk about weight-related issues, as needed.

Planning ahead was a key strategy described by all participants. This involved seeking out accessible environments for socializing, and finding businesses that demonstrated respect
in their customer service. “With obesity every situation you go into you’ve got to decide if this is going to be too stressful. Is it going to cause me problems? Everything you do has to be managed because of the obesity” (participant 7A). Most participants described feeling anxious about the seating in restaurants. Participants often sent someone to the restaurant ahead of time to assess the seating or would call ahead to request a table with a chair able to accommodate their weight and size.

In some cases, participants acknowledged that they needed to overcome their fear of what other people “thought” in order to do what they needed to do in a day. For example, a participant wanted to be more active with her children as she realized the benefit of active family leisure for overall health. She planned to go to a park at regular intervals during the summer months when it was less crowded and the heat was not as intense. She reported that her children expressed much joy in spending quality time with their mom, which was worth the anxiety she experienced in the time leading up to their participation in this activity.

Discussion

Living with obesity has an impact within and across all occupations: self-care, productivity, and leisure. Obesity affects the way in which daily routines are structured. Participant experiences were influenced by personal and environmental factors that appeared to be interrelated. The structure of the daily lives of participants was guided in part by choices they made based on physical ability, past experiences, and the expectations of themselves, family members, and employers.

Fear and isolation associated with being obese had implications on different areas of living, including paid work, care giving, and social relationships. These findings are congruent with Thomas et al. (2008), who identified that opportunities for participation can be limited due to physical conditions associated with being obese. Participants in the present study were restricted in their participation as a result of physical limitations from their weight and size, from obesity related complications, and their limited choices for self-care, productivity, and leisure occupations. Choices for participation in occupations were often based on physical ability and not always on level of interest associated with the activity.

The impact of living with obesity is exacerbated by person-based barriers and, more substantially, barriers in the built and social environment. Such barriers caused participants to withdraw from social roles and responsibilities and to avoid recreational and healthcare environments that were not obesity friendly. Tension was created as a consequence of their desire to participate more actively, which, in turn, was affected by barriers in the built and social environment. These barriers caused many to put participation on hold until they lost weight. In particular, discretionary activities such as socializing were delayed until a change in body size and weight was achieved. In some cases, stigma associated with obesity and the value or worth of an individual’s participating in activities such as dining out, swimming, or working impeded their participation.

Participants in this study were enrolled in an obesity treatment program in which they anticipate a reduced body weight and size. Weight loss was the main objective identified by participants, with primary occupations of eating and exercise being identified as behaviours they felt they needed to modify. Attention to participation in the occupations of daily life, however, was not discussed in treatment settings. Achieving a weight loss that would be “enough” to improve health and well-being would take months and, for some, even with significant weight loss, they would still be classified as obese. For health professionals, including occupational therapists, it is important to facilitate participation in occupations of everyday life at the current weight and not at a theoretical goal weight. For individuals undergoing treatment for obesity, facilitating participation in everyday occupations translates into a concept the authors refer to as “living while losing.”

For participants in this study, obesity challenged their ability to participate in activities identified as meaningful in their everyday lives. All participants were able to engage in some degree in most occupations by adapting the way in which they engaged in activities. However, the quality and diversity of their participation was not at a level with which they were satisfied.

Most participants described “doing what they can” every day and adopting a number of coping strategies in order to facilitate occupational engagement. Supports were found through a sense of internal resilience and, more tangibly, externally from family members. Participants described routine use of energy conservation strategies mainly by breaking activities into manageable steps. A great deal of effort was expended in planning time to enable participation in daily occupations. The process of analyzing environments and anticipating and avoiding barriers in all areas of occupation was consistently described by participants and appears to be a necessary skill to enable participation in occupations of daily living for persons in this study. These behaviours and skills related to participation in everyday living have been described by adults living with chronic illness (Marris, 1996; Moss & Dyck, 2002). Results from qualitative studies on women living with multiple sclerosis, diabetes, and rheumatoid arthritis included themes of limitations to freedoms and achievements due to illness compared to “normal” people, as well as a lack of understanding from others about what it is like to live with fatigue associated with a chronic condition and doing what needs to be done to get through the day, including planning ahead and anticipating barriers (Marris; Moss & Dyck).

Participants in this current study reported similar experiences to those reported in the literature related to the stigma of living with obesity where labels such as lazy, intellectually inferior, and unmotivated are common (Brownell, Puhl, Schwartz, & Rudd, 2005). Participants described being treated differently by their family members, friends, and colleagues who did not have obesity. Differences included lowered expectations of their completing tasks of everyday living due to perceptions that they were not capable of performing activities due to their weight. A belief that higher body weights are associated with less intelligence was experienced by participants in the workplace who believed the intellectual demands of their tasks at work were reduced as their weight increased.
Clinical Implications

Focusing on the strengths of individuals who live with obesity and an effort to address the barriers present in the environment has the potential to influence the experience of adults with obesity. Through a process of collaboration, occupational therapists can work with individuals to structure living so that it is consistent with their values. According to Pentland and McColl (2008), this focus can result in living with occupational integrity, an important concept to consider in the context of overall health and well-being. Interventions that utilize the strengths of individuals and that consider personal values are aimed at changing the built and social environments in which occupation takes place. These types of approaches are consistent with supporting the concept of “living while losing.”

Participation for adults with obesity in this study was influenced by a diversity of complex personal and environmental factors that define disability status and social support. Therefore, a model that considers the interaction of personal and environmental factors would be useful in guiding interventions to enable participation in the occupations of everyday living. The person-environment-occupation (PEO) model. (Law et al., 1996) is a dynamic systems model rooted in environmental-behavioural theories used by occupational therapists to identify interventions for the purpose of enabling performance in the occupations of everyday living (Cooper & Stewart, 1997; Law et al., 1998). The PEO model views the person and environment as dynamic in nature and, therefore, open to change through interventions (Law & Dunbar, 2007).

Results from this study also suggest that a tension exists between what is important to adults living with obesity and the opportunities to participate in meaningful occupations. The occupational theory of human nature (Wilcock, 2006) explains the role of occupation as an influence on health. Wilcock argues that health and well-being are supported with a focus on occupation. Occupation is defined as “doing culturally meaningful work, play or daily living tasks in the stream of time and in the contexts of one’s physical and social world” (Kiellofner, 1995 as cited by Christiansen & Baum, 2005, p. 4). The capability approach to well-being as discussed in the rehabilitation literature (Morris, 2009) fits with the occupational theory of human nature.

The capability approach considers a person’s capacity to perform an activity in the context of opportunities and his or her interest in pursuing participation in a life event. The capability approach emphasizes the value of freedom of choice and has been used as a model to guide discussions by political theorists, philosophers, and social scientists about human health and development (Nussbaum, 2000; Sen, 1984, 1999). Having the right to seek employment on an equal basis with others, being able to enjoy recreational activities, being treated with dignity, and being able to move freely from place to place are a few of the 10 capabilities Nussbaum identified and which have influenced the human development index (HDI). The capabilities approach emphasizes that effective opportunities and freedom to participate are of key importance to human development (Sen, 1999).

The results of this study provide insight into the challenges and successes with participation in occupations of everyday life experienced by adults who are living with class III obesity and currently receiving treatment. Occupational therapists, as they work with clients who have obesity, can focus beyond impairment approaches that seek to change the state of obesity to implement ecological interventions that enable participation in community and socially based occupations.

Limitations

While this study provided a description of what it is like to participate in daily occupations as a person with obesity, it does not provide insight into the meaning of occupation for adults with obesity. The sample for this study included adults who were seeking treatment for obesity. Therefore, the sample characterizes the experience of living with obesity for persons who have made a decision to change a condition that they believe to be having a negative impact on their health and well-being.

Conclusion

The results of this study describe the challenges associated with living with obesity and identify how people adapt in order to continue to engage in activities that are important. Participants were determined to engage in occupations they identified as important to their daily lives. The limitations in physical function and the social and environmental barriers associated with obesity that were experienced by the participants were not unexpected. However, the desire for participation and the impact of the barriers on the choices for participation have not been explored or documented in the literature. The development and evaluation of strategies that enable participation in the occupations of daily living for adults with obesity may reduce its impact on everyday living.

Key Messages

- The physical consequences of obesity limit participation in occupations of everyday living.
- Adults living with class III obesity engage in the occupations of everyday living however the diversity and quality of participation is limited by personal and environmental barriers.
- Occupational therapy that focuses on the strengths of persons living with obesity has the potential to enable participation in occupations by addressing barriers in the built and social environment.

Acknowledgement

The authors are grateful to the participants for being open to sharing their experiences of living with obesity.

References


Effectiveness of a Physical Activity Intervention for Head Start Preschoolers: A Randomized Intervention Study

Laura L. Bellows, Patricia L. Davies, Jennifer Anderson, Catherine Kennedy

OBJECTIVES. The level of children’s motor skill proficiency may be an important determinant of their physical activity behaviors. This study assessed the efficacy of an intervention on gross motor skill performance, physical activity, and weight status of preschoolers.

METHOD. The Food Friends: Get Movin’ With Mighty Moves program was conducted in four Head Start centers. Measurements included the Peabody Developmental Motor Scales, pedometer counts, and body mass index (BMI) z scores.

RESULTS. The intervention led to significant changes in gross motor skills in the treatment group (n = 98) compared with the control group (n = 103) and was a strong predictor of overall gross motor performance (gross motor quotient), locomotor, stability, and object manipulation skills. No intervention effect was found for physical activity levels or weight status.

CONCLUSION. The intervention dose was adequate for enhancing gross motor skill performance but not for increasing physical activity levels or reducing BMI.

Obesity rates in preschool-age children have increased dramatically over recent years. In the United States, 24.4% of children ages 2–5 yr are considered overweight or obese (Ogden, Carroll, & Flegal, 2008). Declining levels of physical activity may play a significant role in the rising childhood obesity rates. Although adults have been shown to overestimate the level of physical activity of youth, most data support the conclusion that the majority of children tend to be physically inactive (Dolinsky, Brouwer, Evenson, Siega-Riz, & Østbye, 2011; Pate, McIver, Dowda, Brown, & Addy, 2008; Williams et al., 2008).

Reasons for low activity levels among preschoolers are not well understood; however, a relationship has been posited between the status of children’s motor skill performance and their levels of physical activity (Williams et al., 2008; Wrotniak, Epstein, Dorn, Jones, & Kondilis, 2006). Several studies have shown that children with poorer motor skill performance were less active than children with better-developed motor skills (Fisher et al., 2005; McKenzie et al., 2002; Williams et al., 2008; Wrotniak et al., 2006). Williams et al. found that children with higher levels of locomotor performance spent significantly more time in both moderate-to-vigorous physical activity and vigorous physical activity and less time in sedentary behaviors than children with lower levels of locomotor performance.

The improvement in motor skills for preschoolers is critical because many children never develop certain mature motor skills and as a result perform poorly as they grow older (Garcia, Garcia, Floyd, & Lawson, 2002). These early failures can damage the child’s self-esteem and lead to avoidance of movement. Children with low motor skills know that they cannot move efficiently and feel...
awkward and inhibited, leading to decreased movement and physical activity (Garcia et al., 2002). Efforts to enhance motor skill proficiency in young children are warranted because such efforts may lead to increased physical activity levels and enjoyment.

The child care setting holds great potential as a venue for interventions focusing on physical activity and gross motor development (Larson, Ward, Neelon, & Story, 2011). In the United States, an estimated 57% of young children attend center-based child care (National Center for Education Statistics, 2006). Because of the large numbers enrolled, child care centers provide opportunities for children to obtain the necessary amount of physical activity and to reinforce adoption of a physically active lifestyle (Ward, 2010). However, research exploring child care–based obesity prevention strategies is limited at this time (Larson et al., 2011; Ward, Vaughn, McWilliams, & Hales, 2010). Few intervention studies for increasing physical activity or gross motor skills in child care exist; thus, there is a great need for additional intervention research.

The Food Friends: Get Movin’ With Mighty Moves® program was developed to enhance motor skill performance and provide opportunities to increase physical activity offerings in the preschool setting (Bellows, 2007; Bellows, Anderson, Davies, & Kennedy, 2009; Bellows, Anderson, Gould, & Auld, 2008). It was designed by experts in nutrition, occupational therapy, and exercise science. To test the efficacy of the program, we conducted a randomized intervention study in eight Head Start centers. Study objectives were to determine whether physical activity relates to motor skill performance, assess whether children participating in the Mighty Moves intervention improved their gross motor skill performance and physical activity levels, and assess the impact of the Mighty Moves program on the weight status of preschool-age children.

Method

Research Design

Mighty Moves was a randomized intervention study targeting 3- to 5-yr-old children enrolled in eight Head Start centers across rural and urban settings who had previously implemented the Food Friends® Fun With New Foods nutrition program.

Participants

Head Start centers were recruited and randomly assigned to participate in the Mighty Moves intervention or the control condition. Staff and teachers assisted with participant recruitment by providing parents with an informational packet (in English or Spanish) containing study details and consent forms. This research was approved by a university institutional review board.

Instruments

Sociodemographic Variables. Birth dates were provided on the consent form to calculate the child’s chronological age. Gender and ethnicity were recorded at the time of the on-site assessment, and when necessary, information was confirmed with teachers and center staff.

Anthropometric Measures. Height was measured using a portable stadiometer (Seca Corp., Hamburg, Germany). Weight was measured using an electronic scale (Lifesource ProFit UC321, Milpitas, CA). Body mass index (BMI), BMI percentiles, and BMI z scores were calculated by EpiInfo (Centers for Disease Control and Prevention [CDC], Atlanta, GA). Children’s weight status was classified using their sex- and age-specific BMI percentile derived from CDC’s growth charts (Kuczmarski et al., 2000).

Peabody Developmental Motor Scales, Second Edition. The Peabody Developmental Motor Scales, Second Edition (PDMS–2; Folio & Fewell, 2000) is a norm- and criterion-referenced fine and gross motor skill test designed for children from birth through age 5 yr. Reliability and validity of the PDMS–2 are reported in the test manual (Folio & Fewell, 2000). Reliability coefficients for the gross motor scales used in this study were high for content sampling (.89–.96), time sampling (.89–.94), and interrater reliability (.96–.99). Additionally, test–retest reliability on the gross motor scale was high (.98) and was responsive to change (Wang, Liao, & Hsieh, 2006). Content validity was determined to be satisfactory (Folio & Fewell, 2000).

The three subtests composing the gross motor scales (i.e., stability, locomotor, and object manipulation) were conducted. Administration and scoring were carried out according to the standardized methods described in the manual. Testing time averaged 20–25 min. Raw scores for each subtest were calculated and transformed into standard scores. A gross motor quotient (GMQ) using all three subtests was also calculated (Folio & Fewell, 2000).

Pedometers. Pedometers have been shown to be a valid measure of preschoolers’ physical activity levels, particularly when the goal is to demonstrate relative changes in physical activity (Cardon & De Bourdeaudhuij, 2007; Pate, O’Neill, & Mitchell, 2010). A Walk4Life pedometer (Model W4L Classic; Walk4Life Inc., Plainfield, IL) with safety strap was sent home along with a log to record the number of daily steps. Parents were asked to put the pedometer on the child when the child got out of bed and...
to take it off when the child went to bed and to record the number of total steps taken each day for 6 days (4 weekdays and 2 weekend days). Mean steps for all 6 days and separate averages for weekdays and weekend days were calculated. Families were compensated $20 for completing the pedometer logs.

**Intervention**

The Mighty Moves intervention lasted 18 wk and was conducted in the classroom 4 days per week for 15–20 min each day, for a total of 72 lessons. Lessons comprised multiple activities (143 total activities) and were led by the classroom teacher. Each week’s activities focused on a skill or group of skills from one of the three gross motor skill categories: stability (trunk strength), locomotor (running, hopping, skipping), or manipulation (ball skills). Early in each week, children were introduced to a motor skill, and movement concepts were added as the week progressed. Later in the program, skill patterns were incorporated into activities.

In addition to Mighty Moves for intervention classrooms, both intervention and control classrooms implemented Food Friends, a 12-wk nutrition program shown to increase children’s willingness to try new foods (Johnson, Bellows, Beckstrom, & Anderson, 2007). As part of Food Friends, children are introduced to Food Friends characters and learn about and taste new foods. Although the Food Friends characters are used in both the nutrition program and Mighty Moves, they are otherwise two distinct programs.

For the intervention, graphics depicting each of the Food Friends characters participating in different physical activities were developed (Bellows et al., 2009). These activities represented different motor skills, which were presented to children as “mighty moves.” In addition to having a mighty move, each character also had a superpower. Characters introduced gross motor skills and movement concepts and led children on imaginary journeys through the town of Healthadelphia®. Materials supporting the lessons, as well as creative themes and concepts, were provided as a kit for each intervention classroom and included a teacher activity binder, a custom music CD, activity mats, flashcards, puppets, scarves, balls, beanbags, ropes, and parent materials (Bellows et al., 2009). Home connection materials were sent home throughout the program, including educational handouts and a copy of the Mighty Moves music CD (Bellows et al., 2011).

All children participated in classroom activities, whereas only children with parent consent participated in the various assessments.

**Fidelity**

Before the study, both intervention and control teachers were required to attend training on the study protocol. Intervention teachers received additional training on gross motor development and age-appropriate physical activity. Six program surveys were administered (every 3 wk) to ascertain teachers’ fidelity to and impressions of program lessons. Fidelity to lessons was measured using a 5-point Likert scale, with 5 being the most positive response, and an option of “did not do.” Eighteen teachers completed the surveys. The average ranking for all activities was 4.04 (out of 5), and the average percentage of activities conducted was 93.9% (range = 81%–100%).

**Data Collection**

Data were collected at each center by research staff over a 2-day period for anthropometric and gross motor measures at baseline and immediately after the 18-wk intervention. Before initiating the study, personnel collecting data were trained by the occupational therapist (author Davies) consistent with evaluation criteria established during the pilot phase of this study (Curtis, 2007). During the pilot phase, data collectors performed assessments and their data were compared with an expert’s (Davies’) score. All data collectors were trained until their scores on individual items matched those of the expert. It was not possible to collect intrarater reliability data in the community settings; thus, the data collectors were randomly assigned to participants across conditions and sites so that any variability across data collectors’ scores would not systematically influence the results. Follow-up training was conducted as necessary. Because of the nature of community-based research and the need for research staff to play multiple roles, blinding of data collection was not possible.

**Data Analysis**

Data were analyzed using IBM SPSS Version 19.0 for Windows (IBM, Armonk, NY). Descriptive statistics (percentage, mean, standard deviation) were obtained for demographic, anthropometric, and weight status variables. Independent t tests were conducted, and no significant difference existed at baseline between treatment groups (intervention and control) and geographic locations (urban and rural) for outcome variables. Thus, data for the two geographic groups were collapsed by treatment group. Pearson product–moment correlations were conducted to determine the relationship between physical activity and motor skills. Correlations of .00–.24 were interpreted as representing a weak relationship, .25–.50 as fair, .50–.75 as
moderate, and >.75 as good to excellent (Portney & Watkins, 2000).

Several two-factor analyses of variance (ANOVAs) with a within-factor variable (time) with two levels (baseline and posttest) and a between-factor variable (treatment group) with two levels (intervention and control) were used to evaluate the intervention effect on motor skills. When significant interactions occurred, post hoc t-tests were used to assess differences between baseline and posttest outcome variables for each group and difference between groups at both time points. A follow-up regression analysis was conducted to examine the intervention effect on motor skills while accounting for the other variables. Two-factor ANOVAs were used to assess a difference in physical activity and weight status between groups (between-factor, intervention and control) across time (within-factor, baseline and posttest). These ANOVAs were repeated using classroom, ethnicity, gender, and age as covariates. BMI z-score was also included as a covariate for physical activity.

Results

Participant Demographics

Two hundred seventy-four children and their parents consented to participate in the study at baseline. Baseline data for on-site measures—child weight status and gross motor skills—were collected on 263 children (intervention group, n = 132 across 18 classrooms; control group, n = 131 across 13 classrooms). Posttest data were collected on 201 children, representing 76% retention. Sixty-two children (n = 34 in the treatment group; n = 28 in the control group) were lost to follow-up because they were absent during data collection or were no longer enrolled at the center. Pedometer logs were returned by 182 families at baseline and 101 families at posttest, for a response rate of 68% and 50%, respectively. Demographic characteristics of the 201 participants were 55% boys, 45% girls, 59% Hispanic, and 32% White. All participants were considered to have low socioeconomic status because of their enrollment in Head Start. No significant differences in participant characteristics existed between groups at baseline.

Baseline Data

Anthropometric, gross motor skill, and physical activity baseline data are presented in Table 1. No significant differences were found between the intervention and control groups at baseline.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at study entry, mo</td>
<td>132</td>
<td>131</td>
</tr>
<tr>
<td>Anthropometric measures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Height, cm</td>
<td>132</td>
<td>131</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>132</td>
<td>131</td>
</tr>
<tr>
<td>BMI, kg/m²</td>
<td>132</td>
<td>131</td>
</tr>
<tr>
<td>BMI z score</td>
<td>132</td>
<td>131</td>
</tr>
<tr>
<td>CDC weight classification, %</td>
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<td></td>
</tr>
<tr>
<td>Obese (&gt;95%)</td>
<td>19</td>
<td>16</td>
</tr>
<tr>
<td>Overweight (85.0%–94.9%)</td>
<td>34</td>
<td>29</td>
</tr>
<tr>
<td>Healthy weight</td>
<td>76</td>
<td>85</td>
</tr>
<tr>
<td>Underweight (&lt;5%)</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Gross motor skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross motor quotient</td>
<td>122</td>
<td>122</td>
</tr>
<tr>
<td>Stability standard score</td>
<td>131</td>
<td>127</td>
</tr>
<tr>
<td>Locomotor standard score</td>
<td>131</td>
<td>127</td>
</tr>
<tr>
<td>Object manipulation standard score</td>
<td>122</td>
<td>122</td>
</tr>
<tr>
<td>Physical activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step counts, 6 days</td>
<td>83</td>
<td>102</td>
</tr>
<tr>
<td>Step counts, weekdays</td>
<td>83</td>
<td>102</td>
</tr>
<tr>
<td>Step counts, weekend days</td>
<td>82</td>
<td>101</td>
</tr>
</tbody>
</table>

Note. BMI = body mass index; CDC = Centers for Disease Control and Prevention; NA = not applicable; SD = standard deviation.

A significant relationship between physical activity measured by the average number of steps recorded across the week was found between the intervention and control groups at baseline.
weekdays and weekend days and gross motor skills (i.e., GMQ) was found before the intervention for all children, $r(170) = .163, p = .034$. A significant relationship also existed between physical activity and the locomotor subtest standard score, $r(170) = .182, p = .014$. Significant relationships between physical activity and the other two subtests, stability and manipulation skills, were not found. When examining physical activity separately for steps on weekdays and weekend days, the relationship with GMQ, $r(168) = .194, p = .012$, and locomotor subscale, $r(178) = .234, p = .002$, existed only on weekend days, but not on weekdays. For the posttest data, no significant relationships were found between physical activity and motor skills.

**Gross Motor Skills**

Children receiving the Mighty Moves intervention demonstrated significant changes in gross motor skills when compared with the control group, shown by analyses of variance. For the PDMS–2 GMQ, the ANOVA resulted in a significant main effect for time, $F(1, 186) = 14.79, p < .0005$; a significant interaction between time and treatment group, $F(1, 186) = 22.62, p < .0005$; and a significant main effect for treatment group, $F(1, 186) = 7.89, p = .006$. For the stability subtest of the PDMS–2, the ANOVA showed a significant interaction between time and treatment group, $F(1, 194) = 17.73, p < .0005$, and a significant main effect for treatment group, $F(1, 194) = 4.85, p = .032$. The main effect for time was not significant, $F(1, 194) = 0.45, p = .501$. For the locomotor subtest of the PDMS–2, the ANOVA showed a significant main effect for time, $F(1, 194) = 28.87, p < .0005$, and a significant interaction between time and treatment group, $F(1, 194) = 10.44, p = .001$. The main effect for treatment group was not significant, $F(1, 194) = 2.94, p = .089$. For the manipulation subtest of the PDMS–2, the ANOVA resulted in a significant main effect for time, $F(1, 186) = 9.47, p = .002$; a significant interaction between time and treatment group, $F(1, 186) = 8.26, p = .005$; and a significant main effect for treatment group, $F(1, 186) = 8.71, p = .004$.

Post hoc $t$ tests further illuminated the significant increase in gross motor skills for children participating in the Mighty Moves program, including a significant increase in GMQ (mean difference from baseline to posttest = 5.73; Figure 1). Similar significant increases were found for each of the three motor subtests in the intervention group but not the control group. A decrease in GMQ was found in the control group (mean difference = −0.50) as well as a significant decrease in stability skills (mean difference = −0.63). These changes are not indicative of a decrease in skill but rather a potentially slower rate of motor development when compared with normative data.

To demonstrate the effects of the intervention, a multivariate approach was used to understand the interrelationship of the variables. Four regression analyses were conducted to examine what variables predicted the change in scores from pretest to posttest for the GMQ, locomotor, stability, and object manipulation subscales. In the first step of the analyses, control variables that were not
expected to affect the development of motor skills were entered (i.e., ethnicity, geographic location, length of school day). Variables that were likely to relate to the development of motor skills were entered in the second step (i.e., age, gender, pretest BMI standard score, pretest scores for each of the three subscales of the PDMS–2). Finally, the treatment variable (intervention vs. control) was entered in the third step. For the GMQ, all variables together accounted for 38.2% of the variance of the GMQ difference score, F(10, 177) = 12.58, p < .0005. Intervention alone accounted for 9.2% of the variance accounted for in the GMQ difference score, F(1, 177) = 27.92, p < .0005. The treatment variable had the largest β weight in predicting the change score in overall motor skill performance (i.e., GMQ; Table 2). Age, pretest BMI standard score, and pretest scores for the stability and object manipulation subscales, in addition to the intervention effect, were significant predictors of the changed score.

For the locomotor subscale, all variables entered accounted for 25% of the variance in the locomotor difference score, F(10, 177) = 7.25, p < .0005. Intervention alone accounted for 2% of the variance in the locomotor difference score, F(1, 177) = 5.10, p < .025. Age and locomotor score at pretest also were significant predictors of change in the locomotor score. All variables accounted for 57.2% of the variance in the stability subscale, F(10, 177) = 25.96, p < .0005, with intervention alone accounting for 4.4% of the variance, F(1, 177) = 19.25, p < .0005.

Additional variables that predicted the change score in the stability subscale were age, initial BMI standard score, and pretest scores on the locomotor and stability subscales. For the object manipulation subscale, all variables accounted for 43.5% of the variance of the difference score for the object manipulation subscale, F(10, 177) = 14.84, p < .0005. Intervention alone accounted for 7.3% of the variance, F(1, 177) = 23.66, p < .0005. Intervention, along with the length of school day, gender, and pretest scores on the stability and object manipulation subscales predicted the change score in object manipulation. Girls made more improvement in the objective manipulation skills compared with boys. No other gender effects on motor skill performance were found.

Significant age effects were demonstrated in the post hoc examination of children receiving the intervention. The 3-yr-olds demonstrated a significant improvement in GMQ, locomotor, and stability difference scores, whereas the 5-yr-olds did not. Related to BMI prescore as predicting change in GMQ and stability scores, regression analysis revealed that the lower the child’s BMI at the outset of the study, the more changes he or she made in motor skill performance compared with children with high BMIs. Moreover, healthy-weight1 children had significant increases in all four motor skill categories demonstrated by post hoc t tests, whereas overweight and obese children had significant improvements only in locomotor skills.

**Physical Activity**

The mean daily step count at baseline was 9,509 (standard deviation = 3,599). No significant differences were found between treatment groups in gender, ethnicity, weight status, and age. Weekday step counts were found to be significantly lower than weekend counts for the treatment group, t(81) = −2.39, p = .02, and for the control group, t(101) = −2.61, p = .01. ANOVAs revealed no intervention effect for physical activity levels from baseline to posttest for total, weekday, or weekend steps. When covariates were used, the results also were not significant.

**Child Weight Status**

ANOVA indicated nonsignificant differences between treatment groups in BMI and BMI z score, whether controlling for covariates or not. Further analysis using post hoc t tests examining changes from baseline to posttest in the treatment group by age and weight status showed no significant increases in weight gain (BMI and BMI z score) for 3-yr-olds and overweight and obese children. Significant increases for 4- and 5-yr-olds and for healthy-weight children were seen.

**Discussion**

The Mighty Moves intervention demonstrated significant changes in gross motor skills among preschoolers. No significant changes occurred in physical activity levels or weight status. These findings suggest that the 18-wk dose (15–20 min, 4 days per week) of classroom programming was adequate for enhancing gross motor skill performance but not for increasing physical activity levels or reducing weight status.

Few intervention studies have examined motor skill outcomes in the child care setting (Logan, Robinson, Wilson, & Lucas, 2012). In a review by Ward et al. (2010) of child care–based physical activity interventions, only five studies targeting motor skill outcomes were identified. All five of the studies had positive effects on

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1The CDC (2011) defines healthy weight for children as having BMI from the 5th to less than the 85th percentile relative to children of the same sex and age.
In terms of weight status, this study did not see significant reductions in BMI $z$ scores. Because obesity is a multifaceted issue, it is unlikely that enhancing gross motor skills alone would have an impact on weight status. Weight status did, however, have an impact on gross motor skill performance. Our regression analyses demonstrate that children with lower BMI $z$ scores made more improvements in motor skill performance than children with higher BMI $z$ scores. Nervik, Martin, Rundquist, and Cleland (2011), who also used the PDMS–2, found a significant relationship between high BMI and low gross motor skills. Overweight and obese children with low motor skills may, over time, be less physically active than their healthy-weight counterparts and at risk for further weight gain.

This study contributes to the literature because of the limited number of published physical activity interventions conducted with preschool-age children (Ward et al., 2010). Other strengths include the use of a norm- and criterion-referenced measure of all major gross motor skills, an objective measure of physical activity, and an intervention-based design to examine changes in motor skills performance and physical activity. Finally, classroom teachers facilitated program activities on a daily basis. The fidelity of program implementation was high; thus, the use of classroom teachers is a strategy that allows for future sustainability of the program. The Mighty Moves program is consistent with the recommendation to embed interventions within existing community organizations (Ziviani, Poulsen, & Hansen, 2009).

**Limitations**

Although the PDMS–2 test is a valid and reliable tool for young children from birth to age 5, we may have seen a ceiling effect in some older children. Thus, the sensitivity to detect change over the intervention period, especially for the 5-yr-olds, may have been diminished.
Second, with the use of pedometers, reporting bias may exist, and because the pedometers could not be sealed, there was a chance of premature resetting. However, no evidence in the literature suggests that children react to pedometers (e.g., by resetting; Pate et al., 2010). Next, because this study was conducted in Head Start centers with a low-income, high-Hispanic population, data presented here may not be generalizable to preschoolers or child care centers as a whole. Finally, although the study population is representative of the state Head Start population, some selection bias as to who enrolled in the study may have existed.

Implications for Occupational Therapy Practice

Occupational therapy practitioners can play an important role in addressing childhood obesity. Results of this study provide the following examples of how occupational therapists can address childhood obesity:

- Occupational therapists can be instrumental in developing and implementing physical activity interventions.
- Occupational therapists can provide training and support for teachers and parents to engage children in physical activity throughout the day.
- Interdisciplinary teams of professionals working to enhance healthy lifestyles in children should include occupational therapists along with nutrition and exercise specialists.

Conclusion

This study demonstrated that children who participated in the Mighty Moves program showed an increase in motor skill performance, but participation did not affect child factors such as BMI. Longitudinal studies are needed to see if improvements in gross motor skill performance in preschool translate to increased physical activity levels later in childhood. ▲

Acknowledgments

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The Role of Occupational Therapy in Obesity Management

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Abstract
Obesity has become a significant and wide-ranging health and social epidemic occurring in both developed and developing nations and across all age cohorts. Occupational therapists provide interventions to individuals, groups, and populations in order to effect change, optimize health, and improve quality of life. Accordingly, occupational therapy services are often integral in addressing obesity-related illnesses and subsequent limitations while managing weight through attention to lifestyle, and the promotion of healthy, active lifestyles. The purpose of this position paper is explain to persons within and outside of the profession the role of occupational therapists, and/or occupational therapy, in obesity management, from an individual and population perspective.

Obesity has become an increasingly common condition that problematically places those affected at an elevated risk for a broad range of acute/chronic health conditions including but not limited to hypertension, type-2 diabetes, coronary artery disease, stroke, sleep apnea, muscular-skeletal difficulties, hyperlipidemia, and several forms of cancer. In addition, obesity is also believed to contribute to the development and manifestation of various psychological conditions and mental health problems (i.e., anxiety, depression, stigmatization, etc.). As such, obesity is now considered a multi-factorial chronic disease itself, associated with a myriad physiological, psychological, and quality of life deficits. Like many other chronic diseases, the etiology of obesity cannot be linked to one primary cause. Rather, an intricate interplay of biopsychosocial factors – most notably genetics, poor diet, and/or sedentary behaviour – are believed to contribute to the development and maintenance of the condition.

Defined as a body mass index (BMI) score of 30 kg/m² and above, obesity has reached epidemic/pandemic status in many countries throughout the developed and developing world. Globally, over 1.4 billion people are considered overweight (BMI ≥ 25 kg/m²) or obese and obesity has become the fifth leading cause of death worldwide, in large part due to increased risk of various significant comorbidities (i.e., cardiovascular disease, diabetes, various cancers). Within the obesity spectrum, the rate of morbid obesity (BMI ≥ 40 kg/m²) is growing most rapidly and across all age cohorts. Equally troubling is that approximately one-third of North American children 6 to 19 years of age are considered overweight or obese (defined as being at or above the 85th percentile of the sex-specific BMI-for-age growth chart), putting them at risk for a variety of the aforementioned health risk and concerns. In Canada, approximately one in four Canadians are clinically obese, creating significant challenges for the Canadian health care system.

In 2008, the economic impact of obesity in Canada was estimated to be $7.1 billion, up 19% from 2000. As a result of the numerous health complications within the clinically obese population, the average health care costs now exceed $10,000 per patient per year. Given the severity of the disease and significance of the economic and health care burdens involved a need for intervention at both clinical and population levels is paramount.

Accordingly, various strategies, ranging from health promotion initiatives, improvements in education, and increased funding for bariatric surgery have been proposed and/or adopted to some degree. However, given the multi-factorial nature of obesity, a multi-factorial approach should also be utilized in managing obesity. Specifically, in order to effectively manage obesity at an individual or population level, a multi-disciplinary approach, comprised of allied health care practitioners and specialists, is essential in order to attain optimal results for individuals living with obesity. Of particular
interest and intrigue is the role of the occupational therapist in various aspects of obesity management.

Occupational therapy is the art and science of enabling engagement in everyday living through occupation. In addition, the profession enables highly trained individuals to promote and develop the health and well-being of others. As a form of prevention and intervention, occupational therapists assist people with physical, psychological, and environmental conditions through education and the use of assistive devices designed to improve their quality of life. In terms of obesity, overall treatment/management options may include education, counseling, rehabilitation, lifestyle modification, pharmacotherapy, and/or bariatric surgery.

Given the context of obesity and its current treatment modalities, obesity management is of great interest to the occupational therapist. Occupational therapists (OT) consider obesity within the chronic disease/illness paradigm or as a health condition across the obesity spectrum (stage 1-4 or class I-III). Class I obesity is defined as a BMI (kg/m²) between 30.0-34.99, class II obesity as a BMI between 35.0-39.99 and class III as a BMI ≥ 40.00. Occupational therapists are trained to provide vital insight into enabling participation in physical activity, developing functional environments, maintaining independence and addressing societal challenges posed by physical limitation, including obesity. As such, individuals living with obesity are likely to benefit from the services of an occupational therapist.

Through advocacy, occupational therapists promote client services to address obesity. These may include goal setting activities, health promotion undertakings, job site analysis, equipment adaptation and support with activities of daily living. Furthermore, therapists are ideally situated to address the stigma related to obesity through research, education, and self-reflective practice. For instance, therapists may liaise between an employer and employee in order to minimize the stigma associated with obesity and facilitate a timely return to work when applicable. The therapist plays a pivotal role in the return to work process and meeting both the needs of the worker and the employer. Facilitating improved communication and setting realistic goals will help foster a collegial atmosphere and decrease workplace absenteeism. Obese individuals frequently experience bias, stigmatization and discrimination due to weight. Weight bias refers to “the inclination to form unreasonable judgments based on a person’s weight”. Stigmatization refers to a generalized devaluation and social exclusion of individuals as a result of deviance in particular attributes, like being overweight.

As part of a multidisciplinary team, the role of the occupational therapist includes working closely with clients/patients in developing, designing and implement client-centered goals. Like other allied health professions, occupational therapists focus on client-centered approaches to practice. Whether during assessments, treatments or at team rounds, the client is the focus of the occupational therapy. The OT’s relationship with each client is to bring their knowledge and expertise to help increase the client’s occupational performance and allow the client to make informed decision. Moreover, a therapist is often critical in placing the values of meaningful occupations and considering assessments that increase function and a client’s occupational performance. Using different assessment processes that measure occupational performance issues and components, the therapist gathers evidence to select a treatment plan that would fit that client’s unique needs.

The functional, social and medical sequelae of obesity are consistent with other chronic conditions that result in disability. With the current prevalence of obesity and the role that occupational therapy plays in the management of chronic conditions, OTs come into contact with obese persons in their clinical practice on a regular basis. People with obesity should have access to evidence-based, interprofessional and collaborative health services throughout their lifespan.

Occupational therapists are ideally situated to provide care to people with obesity. Healthy occupations, in the framework of obesity prevention, refers to participation in physical activity and the intake of a nutritionally balanced diet. This necessitates skills and access to participate in physical activity and healthy food choices. In the context of obesity treatment, healthy occupations include, in addition to physical activity and healthy eating, access to services that meet the biopsychosocial needs of persons with obesity.

Obesity is a chronic disease for which treatment options include lifestyle modification, pharmacotherapy, and surgery. OTs are pivotal contributors to a health care team for persons with obesity, as in other areas of chronic disease prevention and management. OTs need to be informed of current evidence based practices and should be leaders in terms of enabling clients, groups and communities to engage in meaningful activities that will enhance or improve their health. Clients with obesity are at risk for occupational deprivation in the areas of self-care, leisure and productivity. Therefore, persons at risk of developing obesity or persons with obesity would benefit from access to occupational therapy services.

Obesity is a multifactorial condition that for some clients is a temporary state. However, for other individuals, obesity is a chronic condition that will require occupational therapists to work closely with individuals to develop client-centered goals that improve their occupational performance. Obesity and weight bias are growing issues in Canadian society and must be regarded as serious problems. This stigmatization has serious socio-economic, health and psychological consequences for obese individuals. Now that the types and prevalence of weight bias have been identified, the focus must move toward identifying how to rectify this societal issue. The mechanism underlying the stigma must be identified so that effective intervention strategies can be developed and implemented.
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Acknowledgements

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References

27. Canadian Institute of Healthy Living and Chronic Disease Prevention. Medical Education

The Role of Occupational Therapy in Obesity Management
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References

Guest Editorial

Promoting Health, Well-Being, and Quality of Life for Children Who Are Overweight or Obese and Their Families

Michael A. Pizzi

Obesity is a complex, multidimensional challenge that compromises occupational participation for children and families. Children who are overweight or obese are at serious risk for being stigmatized, bullied, or marginalized, and they often are medically compromised. They cope daily with occupational participation issues at home, in school, on playgrounds, and in their communities. Prevention and health promotion assessment and intervention in occupational therapy are imperative for the profession to make a significant and sustainable difference in the lives of these children and families. Innovative client- and occupation-centered programming promotes health, well-being, and quality of life for this population. It is incumbent upon occupational therapy practitioners to prevent occupational marginalization, deprivation, and alienation while promoting occupational justice for children who are overweight or obese.


Childhood and adult obesity has escalated to a national and worldwide epidemic. The statistics are remarkable (Table 1), and the escalation appears endless. It has become a public health issue, especially as the trajectory for being overweight or obese among children continues to climb. World Health Organization (WHO; 2016a) statistics demonstrate that globally, insufficient physical activity, one of the greatest contributors to childhood obesity, has become pandemic (Figure 1).

Obesity and overweight affect children’s morbidity and mortality, overall health, academic achievement, and quality of life (WHO, 2016a). From an occupational perspective, meaningful engagement and active participation in childhood occupations in any context are significantly diminished by being overweight or obese, in turn undermining a child’s physical, social, emotional, and mental health (Kuczmarski, Reitz, & Pizzi, 2010; Pizzi et al., 2014). Given the projected increases in childhood obesity, occupational therapy practitioners must fill an immediate societal need by being informed about the epidemic and taking immediate and sustainable action. The outcomes of medical interventions (e.g., medication, surgery) are inconsistent, but occupational therapy has a vital role in promoting health, well-being, and quality of life for children and youth who are overweight or obese and their families:

The obesity epidemic is a societal need to address, as it affects occupational needs of individuals, communities, and populations. The epidemic also affects the health of individuals and communities in many areas: social, physical, psychological, spiritual and economic. As a profession, we have an unfolding and expanding opportunity to develop solid, evidence-based and scientific strategies to intervene with individuals and communities coping with the childhood and adult obesity epidemic from a prevention and health promotion perspective. (Pizzi, 2013, p. 81)

Childhood Obesity, Health, and Occupational Challenges

Increasing evidence indicates that the health, well-being, and quality of life of children...
who are overweight or obese are compromised (WHO, 2016a). According to the Centers for Disease Control and Prevention (CDC, 2015), children who are overweight or obese are at risk for the following:

- High blood pressure and high cholesterol, which are risk factors for cardiovascular disease (CVD). In one study, 70% of obese children had at least one CVD risk factor, and 39% had two or more.
- Increased risk of impaired glucose tolerance, insulin resistance, and type 2 diabetes.
- Breathing problems, such as sleep apnea and asthma.
- Joint problems and musculoskeletal discomfort.
- Fatty liver disease, gallstones, and gastroesophageal reflux (i.e., heartburn).
- Psychological stress such as depression, behavioral problems, and issues in school.
- Low self-esteem and low self-reported quality of life.
- Impaired social, physical, and emotional functioning (para. 13).

Children who are obese are more likely to become obese adults, with health consequences that include heart disease, diabetes, metabolic disorder, and cancer (Biro & Wien, 2010). Obesity in one parent is correlated with obesity in offspring; other factors that place children at risk for being overweight or obese include ethnicity, educational level of head of household, and family income level (CDC, 2015).

Every occupation of childhood is affected by obesity, including occupational engagement and participation. Social and mental health issues include marginalization, stigmatization, being bullied, development of a negative self- and body image, poor social participation, and depression (CDC, 2015; Davison & Birch, 2001; Pizzi & Vroman, 2013; Puhl & Latner, 2007). Prejudicial attitudes among health professionals, including occupational therapists, can compromise service delivery (Vroman & Cote, 2011).

Many occupational therapy practitioners work with children with special needs, including physical, mental, and socioemotional challenges. Research indicates that more than 40% of children with a disability are at higher risk for being overweight or obese (Rimmer, Rowland, & Yamaki, 2007), and children with developmental delay are more likely to be overweight by age 3 than their nondisabled peers (Emerson, 2009; see also Bazyk & Winne, 2013).

Approaches to Childhood Obesity

Systems thinking is foundational for occupational therapy practitioners’ clinical reasoning regarding occupational challenges. Occupational therapy models and theories, even those not directly addressing client health and well-being needs, examine the interaction among the person, the environment, and the occupation:

In occupational therapy, a thorough evaluation of a child, including contextual factors (i.e., family and school) is critical because the transaction between children and environments in which they live and engage in play, learning, and other everyday activities significantly influences their development and health. . . . A systems perspective offers a lens through which there is inclusion of quality of life, health, and contributory factors that impede or support participation and occupational performance. (Pizzi & Vroman, 2013, pp. 103–104)

Reasoning through occupational issues related to children who are overweight or obese using systems thinking must also include use of public health models that emphasize prevention and health promotion. Bazyk’s (2011) work in the area of public health related to the mental health of children and adolescents has emphasized a three-tiered public health model for intervention while also advocating for a systems perspective. This model corresponds to the primary, secondary, and tertiary areas of prevention; is strengths based; and focuses on supporting all children coping with the challenges of being overweight or obese.

Tier 1 includes universal interventions involving health promotion and primary prevention for whole populations of children, including children who are overweight or obese and those who do not have any weight issues. Targets can include an entire school system or any environment in which children play, learn, and live. Examples of Tier 1 interventions are

- Consultation with schools regarding the promotion of physical activity, play and recess, and positive mental health for all children;
- Creation of systemwide programs that incorporate movement, nutrition, and healthy routines;
- Development of culturally specific occupation-based educational strategies that can be implemented in schools and communities to help children maintain healthy weight; and
- Diversity training for students and teachers to eliminate bullying behaviors and weight bias.

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<th>Category</th>
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<tr>
<td>Adults</td>
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<tr>
<td>Youth</td>
<td>17</td>
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<tr>
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<tr>
<td>Women</td>
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<tr>
<td>Age, yr&lt;sup&gt;b&lt;/sup&gt;</td>
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<sup>Note. FPL = Federal Poverty Level.</sup>
<sup>a</sup>Data from Centers for Disease Control and Prevention (CDC), 2016a. <sup>b</sup>Data from CDC, 2016b.
The Comfortable Cafeteria and Refreshing Recess programs are examples of embedded programs developed by occupational therapists that focus on healthy food choices, positive social interaction, and enjoyable active play (Every Moment Counts, 2013a, 2013b).

Tier 2 involves targeted interventions or secondary prevention for children at risk for being overweight or obese. Some of the most at-risk children include those with disabilities and those living in poverty (CDC, 2015). These children often face occupational deprivation, marginalization, lack of access to healthy foods, limited opportunity for physical activity, and environmental demands not known to other children (Pizzi et al., 2014). Children at risk for being overweight or obese are also at risk for being bullied and stigmatized (Pizzi & Vroman, 2013; Puhl & Heuer, 2010; Puhl & Latner, 2007). Occupational therapy practitioners have the skills and knowledge to create prevention programs for at-risk children focused on social and recreational activity that promotes healthy eating, movement, and social participation in a stress-free and safe environment, both during and after school. To intervene at this level, enabling children’s positive physical, mental, and social health, occupational therapy practitioners must be aware of the multiple factors that place children at risk.

Tier 3 interventions involve more individualized activities correlating with tertiary prevention for children and youth who are already overweight or obese and who require direct intervention. This group requires more than functional and educational assessment; they require assessment focused on health and well-being, motivation to change a health behavior, and investment of family and individual time and effort to make that change in behavior. One such assessment tool is the Pizzi Healthy Weight Management Assessment (Pizzi, 2014), which has been used in several research and clinical studies; more occupation-based and health-focused assessments are needed to help meet society’s needs. Examples of targeted interventions include recommending culturally specific healthy routines, evaluating families’ cooking styles and food preferences, teaching home management strategies that promote health and well-being, and developing walking or dance programs for children and families that can easily be implemented daily. Above all else, occupational therapy practitioners must remain client centered throughout the process, incorporating all factors that will help each client sustain a lifelong commitment to improving health behaviors.

Occupational therapy practitioners have done an exemplary job in the area of tertiary prevention, in which the role of rehabilitation specialists is appreciated. Much greater understanding of the occupational challenges and possibilities for positive health behavior change among communities and populations is necessary for the health care community to recognize occupational therapy as a major force toward change.

National Goals for Obesity Prevention and Occupational Therapy

Institute of Medicine

The Institute of Medicine (IOM; 2012) report Accelerating Progress in Obesity Prevention discusses five major goals and...
provides recommendations, strategies, and action plans for obesity prevention. Occupational therapy has a significant opportunity to translate these goals to practice.

**Goal 1: Make Physical Activity an Integral and Routine Part of Life.** Promoting physical activity through play and engaging children and adolescents in fun, interesting, and engaging activity that is grounded in moving and interacting with others is standard occupational therapy intervention for children with special needs. A commitment by practitioners to properly assess and intervene with children who are obese or overweight is necessary to ensure that all occupational and health needs are met for every child, including those who do not have special needs. It is vital to intervene early in children’s lives and to promote movement activities for individuals, communities, and populations. Education for children and their parents and caregivers about the health benefits of movement, intertwined with actual movement activity, is imperative to improve occupational health and prevent disease and disability for those who are overweight or obese.

**Goal 2: Create Food and Beverage Environments That Ensure Healthy Food and Beverage Options Are the Routine, Easy Choice.** Occupational therapy practitioners work in homes, schools, and communities where children live, learn, and play. In each of these environments, education about what constitutes a healthy food source and which beverages are healthy and unhealthy for children can be an effective strategy to implement using occupation-based activity. Occupational therapy practitioners can make a difference by advocating (e.g., with legislators) for health policies on consumption of less sugary drinks, providing health education activities for families and schools about offering healthy snacks and less sugary drinks during snack times or play breaks, and creating Tier 1, 2, and 3 interventions that help children always choose the healthy option.

**Goal 3: Transform Messages About Physical Activity and Nutrition.** Positive and hopeful messages offered by the media and in home, school, and community environments will support behavior change toward healthy weight management. It will take a multisector effort to enable that change. A mandate for all occupational therapy practitioners is to develop positive and powerful health messages that promote a commitment to physical activity and healthy nutritional options. Practitioners can, for example,

- Educate families and youth, in fun and interesting ways, about the body and its systems and about how increasing physical activity and nutrition makes the body stronger for occupational engagement;
- Use positive messages about making water a more desirable and interesting option than fruity and sugar-added juices during breaks, and educate families about the health benefits of water; and
- Develop family education sessions, individual treatment sessions, and community-based workshops that educate through activity.

It is also vital that practitioners and the profession transform messages about physical activity and nutrition using a health literacy approach in a way that helps the general public connect the messages with occupational engagement. For example, practitioners can provide families with fun strategies to help children eat healthier, and they can help society understand that play and any activity incorporating movement and occupational engagement improve health. As a profession, we must continue to create and provide powerful, positive health messages that link occupation to health and ensure that our message is made public through various media sources.

**Goal 4: Expand the Role of Health Care Providers, Insurers, and Employers in Obesity Prevention.** Occupational therapy practitioners must help transform what is meant by early intervention and educate insurers that early intervention must include prevention, particularly with communities and populations. Practitioners can implement this goal by addressing childhood obesity and prevention through primary care practitioners including physicians, physician assistants, nurse practitioners, and all practitioners involved in any setting related to childhood obesity. Talking to and educating insurers about the benefits of occupation as prevention will continue the conversation that occupational therapy is a vital service. Finally, development of obesity prevention and health-related occupation-centered programs for schools and businesses can create new pathways for the profession to pursue.

**Goal 5: Make Schools a National Focal Point for Obesity Prevention.** According to the 2015 American Occupational Therapy Association (AOTA) workforce and salary survey, 60.8% of occupational therapists work in school settings in direct intervention, and 13.7% work as school consultants. Pizzi and Orloff (2015) strongly suggested that anyone working in school systems begin to document and advocate for healthy weight management goals. Occupational therapy practitioners need to explore the impact of obesity on academic achievement, including school attendance, which is often diminished because of health problems related to being overweight or obese. When occupational therapy practitioners clearly and consistently articulate and document the link between healthy weight management and occupational participation in school, then children, their families, and their school systems and communities will better understand the power of occupation in children’s lives. Being knowledgeable about and advocating for increasing recess in schools can help all children achieve and maintain healthy weight (AOTA, 2012).

**World Health Organization**

A WHO (2016b) Commission for Ending Childhood Obesity report cited six strategies that can be adapted and implemented by occupational therapy practitioners:

1. Implement comprehensive programs that promote the intake of healthy foods and reduce the intake of unhealthy foods and sugar-sweetened beverages by children and adolescents.
2. Implement comprehensive programs that promote physical activity and reduce sedentary behaviors in children and adults.
3. Integrate and strengthen guidance for noncommunicable disease prevention with current guidance for preconception and antenatal care to reduce the risk of childhood obesity.
4. Provide guidance on, and support for, healthy diet, sleep and physical activity in early childhood to ensure children grow appropriately and develop healthy habits.

5. Implement comprehensive programs that promote healthy school environments, health and nutrition literacy and physical activity in school age children and adolescents.

6. Provide family-based, multicomponent, lifestyle weight management services for children and young people who are obese. (pp. viii–xi)

**Occupational Therapy’s Role in Achieving National Goals**

Occupational therapy practitioners can strengthen the IOM and WHO goals and strategies by collaborating with colleagues and creating interdisciplinary programs. It is important to acknowledge the strengths and contributions of others working to address childhood obesity, such as nutritionists, physical therapy and nursing professionals, health educators, primary care personnel, psychologists, community organizers, social workers, and those in the creative arts professions. The onus is on the occupational therapy profession and practitioners to expand what we do and whom we collaborate with, to think outside the box, and to be creative and innovative to help meet this societal need.

**Future Directions for Occupational Therapy in Obesity Prevention**

Preventive, proactive, and innovative approaches are needed to reduce the health impact of childhood obesity for all societies and populations (WHO, 2016b); “[t]hese innovative approaches need to consider the child’s occupational challenges in the context of multiple environments” (Pizzi & Orloff, 2015, p. 29). The occupational therapy profession needs to align itself with the health, well-being, and quality of life issues that affect society. Children who are overweight or obese are challenged in all of these areas on a daily basis, yet practitioners often overlook their health and wellness needs to meet only their functional or educational needs. Although this omission may be a result of school or reimbursement mandates, it is vital to address children’s overall health needs, which affect their functional and educational needs. Use of a systems perspective enables health through occupation. Attending to the child as a person with multiple occupational challenges and being aware of the impact of obesity on a child’s functional and educational needs can only strengthen the profession and practitioners’ assessments and interventions. Children who are overweight or obese are best served when they are viewed as occupational beings who participate in family, community, and society.

The following list, although not all inclusive, provides guidance for occupational therapy practitioners and other health professionals working with children who are overweight or obese:

- Develop and implement family-centered care and education for families with parents and children who are overweight or obese.
- Integrate health promotion and prevention throughout all occupational therapy curricula related to obesity and healthy weight management.
- Create school-based occupational therapy interventions that meet the individualized education program and health and wellness needs of children who are obese or overweight.
- Create multilingual and culturally appropriate educational materials, in clear and understandable language, that explain the direct link between obesity and academic achievement.
- Develop fun and engaging community-based, occupation-centered after-school programs that enable physical activity and healthy food choices, some of which could also be family centered.

It is imperative that occupational therapy practitioners engage in assessment and intervention of children who are overweight or obese using a public health framework, including assessment and intervention of family systems. Children do not play and participate in life in a vacuum, but rather must be viewed as being in constant interplay with families, schools, and communities, the environments in which they interact.

The best program or intervention and outcome will never make a difference to the larger society, however, unless others are informed about the power of occupation. To meet the societal and global challenge of childhood obesity, the occupational therapy profession must be visible, produce evidence, and make it known how well we transform individual lives and communities. The future of each child depends on it. ▲

**Acknowledgments**

I acknowledge the collegiality and support of the AOTA Obesity Prevention and Health Promotion Work Group; Lorie Richards, AJOT editor-in-chief, who believed in the need for this special issue; and Susan Bazyk, for her review of this editorial.

**References**


**OCCUPATIONAL PERFORMANCE**

Children who are overweight or obese may be challenged in the following areas of occupation:

**Social Participation**
- Difficulty in making and keeping friends due to weight bias
- At risk for bullying and/or social isolation
- At risk for mental health disorders such as anxiety and depression
- May struggle with limited self-esteem and poor body image

**ADL**
- Difficulty in choosing and preparing healthy meals

**Education**
- At risk for decreased endurance and capacity on playground and in physical education
- Potential decrease in academic performance due to social stresses

**Work**
At risk for experiencing physical and/or social barriers at workplace, such as after-school jobs or internships

**Play/Leisure**
- Possible imbalance between sedentary and physical activities
- Too much screen time (computers, television) leading to isolation and weight gain

**Sleep/Rest**
- Excessive rest and sleep due to depression and/or low energy levels
- Poor sleep patterns at night could lead to decreased energy and academic performance

**OCCUPATIONAL THERAPY PRACTITIONERS** use meaningful activities to help children and youth participate in what they need and want to do in order to promote physical and mental health and well-being. Occupational therapy practitioners focus on participation in the following areas: education, play and leisure, social participation, activities of daily living (ADLs; e.g., eating, dressing, hygiene), instrumental ADLs (e.g., preparing meals, shopping), sleep and rest, and work. These are the usual occupations of childhood. Task analysis is used to identify factors (sensory, motor, social-emotional, and cognitive) that may limit successful participation across a variety of settings. Activities and accommodations are used in intervention to promote successful performance in school, home, and community settings.

**ABOUT CHILDHOOD OBESITY**

Childhood obesity is defined as a condition in which excessive body fat negatively affects a child’s overall health or well-being across all environments, including home, school, and the community. Obesity is further defined as an individual with a body mass index at or above the 95th percentile for children of the same age and gender. The most common causes are genetic factors or family history of obesity; decreased participation in physical activities; unhealthy eating patterns or behaviors; and, in rare cases, medical conditions.

**Who’s at risk of becoming overweight or obese?**

1. **Children who live in impoverished areas with limited access to:**
   - Safe Parks
   - Nutritional foods such as fresh produce
   - Local recreational centers
   - After-school clubs such as gardening
   - Affordable fees for team sports and equipment
   - Information for youth and family regarding nutrition

2. **Children with developmental disabilities** are 40% more likely to develop obesity due to secondary conditions (pain, social isolation, de-conditioning) and/or predisposing factors (genetic syndromes such as Prader-Willie, medications that increase weight gain). They also may have limited access to:
   - Accessible playgrounds and parks
   - Trained staff to adapt programs for inclusion
   - Equipment and assistive devices that allow for participation

**How does obesity impact physical health?**

Children who are overweight or obese are at risk for developing the following health conditions: asthma, type 2 diabetes, cardiovascular disease, high blood pressure, high cholesterol, and fatty liver disease. They may also be at risk of:

- Decreased joint flexibility and orthopedic problems leading to limitations in physical play.
- Sleep apnea and inability to develop proper sleep patterns, which may limit energy levels and attention at school.

**How does obesity impact social and emotional health?**

Children who are overweight are at risk of weight bias (or weight stigma), which refers to negative judgements of an obese person based on social attitudes or stereotypes (e.g., lazy, poor self-control). Weight bias from adults and peers may result in negative remarks about appearance, verbal teasing, name calling, social exclusion, and physical bullying, leading to:

- Poor self-esteem and body image
- Feelings of loneliness and isolation
- Difficulty in making friends
- Withdrawal
OCCUPATIONAL THERAPY PRACTITIONERS can play important roles in addressing childhood obesity in a variety of settings, including in schools and communities and at home. In each setting, intervention may focus on a number of areas, including culturally appropriate healthy food preparation and meals, enjoyable physical and social activities, and strategies for decreasing weight bias/stigma and bullying. Messages should focus on “health and a healthy lifestyle” rather than weight loss. Services can help children identify personal character strengths (e.g., creativity, humor, thoughtfulness) and build on them. Occupational therapy practitioners can play a critical role in working with school teachers, nutritionists, and other professionals to enhance healthy lifestyles in all children and youth.

LEVELS OF INTERVENTION

Promotion: Whole population approaches fostering mental and physical health at the universal level (e.g., school-wide efforts to promote healthy lunches and opportunities for physical activity).

Prevention: Targeted, culturally appropriate interventions focusing on at-risk groups such as children living in poverty or those with disabilities (e.g., small-group after-school clubs emphasizing nutritious food preparation and enjoyable physical activities).

Intensive: Interventions designed for those who are overweight or obese (e.g., individualized programs to foster healthy habits and routines, including enjoyable activities and nutritious meals).

Home: Work with families to promote health meal choices and routines consistent with their culture. Encourage designated family dinner time. Promote family participation in enjoyable physical activity such as riding bikes or walking. Develop graduated physical programming so that family members can participate.

School: Promote anti-bullying programs that teach respect for differences. Teach children to use respectful language, such as phrases like “above average weight” rather than offensive words like “chunky,” “obese,” or “fat.” Join or help develop wellness committees that promote health and positive lifestyle behaviors for children of all body sizes—with the overall message being “healthy at any weight.” Work with school officials and administration to decrease availability of vending machines that offer foods containing high calories and sugars. Create a gardening program in the school. Help infuse physical activity throughout the school day. Promote after-school clubs such as performing arts and sports to increase physical activity and social participation. Pair the AOTA Backpack Awareness campaign with a school walking program. Work from a strengths-based perspective to increase positive growth and self-esteem.

Community: Encourage inexpensive community activities such as Walking Networks, Cycling Networks, Public Open Spaces, and Recreational facilities. Encourage participation in non-competitive sports teams to increase self-esteem, confidence, socialization, and friendships.

FOR MORE INFORMATION


CHECK THIS OUT!

• A site “dedicated to ending the increase in childhood obesity and helping all kids and their families lead healthy, active lives.” www.clintonfoundation.org

• Definitions, statistics, useful resources, and state obesity programming. www.cdc.gov/obesity

• Obesity Prevention Program www.just-for-kids.org

• Obesity Prevention Program www.moveitloseitlivehealthy.com

• Yale Rudd Center for Food Policy & Nutrition provides a toolkit for health care providers on preventing weight bias in clinical practice. www.yaleruddcenter.org/resources/bias_toolkit/index.html


Ways to Reduce Weight Bias

1) increase awareness of personal attitudes regarding weight,
2) use sensitive language when referring to weight,
3) intervene to decrease weight-biased teasing,
4) find role models to assist with confidence and self-esteem building, and
5) emphasize overall health instead of thinness. Refer to the sidebar regarding the Yale Rudd Center for Food Policy & Nutrition.
TREATMENT OF OBESITY IN CHILDREN AND ADOLESCENTS IN PRIMARY AND SECONDARY CARE SETTINGS

RECOMMENDATIONS: A SUMMARY FOR PRACTICE
This publication was written and produced by the Institut national d’excellence en santé et en services sociaux (INESSS).

This document is available online in the Publications section of our website www.inesss.qc.ca.

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This document condenses all the recommendations formulated in the clinical practice guideline for the treatment of obesity in children and adolescents. These guidelines are designed to support the treatment of children (aged 5 to 12 years) and adolescents (aged 13 to 17 years) with obesity in primary and secondary care settings. They incorporate the findings of scientific studies, along with experiential and contextual knowledge, with the aim of guiding practices and service organization in order to improve children’s and adolescents’ health and well-being either by reducing their level of obesity or by improving their physical health and/or their psychological and social well-being.

These guidelines are intended for:
- physicians (general practitioners, pediatricians or endocrinologists);
- other health and social service professionals concerned, in particular:
  - nurses,
  - dietitians,
  - kinesiologists,
  - psychologists,
  - social workers,
  - psychoeducators,
  - pharmacists,
  - occupational therapists,
- administrators in the health and social service system who have a role to play in organizing care and services for young people with obesity;
- children and adolescents with obesity and their parents, who will find answers to some of their questions.

Readers interested in understanding the foundations underpinning the recommendations or the process used to develop them are invited to refer to the two documents composing the guidelines: Part 1, which addresses the guidelines themselves and Part 2, which provides an overview of the framework, process and methods for developing the clinical practice guidelines, both available online in French only: www.inesss.qc.ca.
VISION AND PRINCIPLES GUIDING THE INTERVENTION

The intervention must be guided by a broad perspective of the child or adolescent presenting with obesity. He or she must be approached globally, as a whole person, and must be placed at the centre of the intervention, given that obesity is only one of the many factors liable to affect his or her health and well-being. Above all, the intervention must be designed to improve these young people’s health and well-being and must in no way harm them or their families.

SUMMARY OF THE RECOMMENDATIONS

1- EVALUATE AND REFER

INESSS RECOMMENDS THAT physicians or other concerned health and social service professionals practicing in primary or secondary care settings:

R1- evaluate, according to their fields of expertise:  
- the presence of obesity and the young person’s health status and well-being, according to the modalities recognized by professional or scholarly organizations;
- the different factors liable to affect participation in the intervention, adherence to and compliance with the intervention plan or the outcomes of the intervention.

This evaluation must be comprehensive: it must address not only physical health aspects but also psychological and social aspects;

R2- refer children and adolescents, when necessary, to more specialized professionals, especially in the presence of severe obesity or major comorbidities related to physical health or well-being.

* SR: Strength of recommendation (S = strong; W = weak; EO = expert opinion).
QE: Quality of evidence (H = high; M = moderate; L = low; VL = very low) (see page 9).

1 BMI greater than or equal to the 99.9th percentile for age and sex, or a BMI z-score greater than or equal to 3.0.
2 Examples include diabetes, uncontrolled hypertension, severe psychological distress, and eating disorders.
Physical health aspects (based on patient history and physical examination):

- BMI
- blood pressure
- level of participation in physical activities and sedentary activities
- eating habits
- presence of:
  - respiratory problems (sleep apnea, asthma)
  - gastro-intestinal conditions (gastro-oesophageal reflux, hepatic steatosis)
  - musculoskeletal conditions (pain, limping, tibia vara, etc.)

Elements related to children and adolescents’ well-being and motivation:

- presence of psychological disorders (anxiety, depression, etc.)
- self-esteem
- impulsiveness
- victimization by peers or family members
- sense of self-efficacy
- prior obesity treatments attempted
- motivation to change

Parameters for basic paraclinical investigations:

- fasting blood glucose
- lipid profile (total cholesterol, triglycerides, LDL cholesterol, HDL cholesterol, and ratio of total cholesterol to HDL cholesterol)
- liver enzymes

Elements related to family and social environment:

- capacity to provide support
- family structure, dynamics and organization
- parenting skills
- psychological or social problems
- motivation
2- TREAT OR GUIDE

Lifestyle Approaches

INESSS RECOMMENDS THAT physicians, dietitians and other health and social service professionals, according to their respective fields of expertise:

R3- give preference to lifestyle interventions for all children and adolescents with obesity, such interventions incorporating three approaches:
  • dietary,
  • physical activity (increased participation in physical activities and decreased participation in sedentary activities), and
  • behaviour management;

R4- DO NOT recommend very-low-calorie dietary approaches;

R5- plan and develop their interventions by taking into account the stages of child or adolescent physical, psychological and social development;

R6- use lifestyle interventions involving parent participation, according to methods that take into account young people’s development:
  • For children
  • For adolescents;

R7- offer interventions as a priority to motivated young people or to motivated parents;

R8- focus on developing motivation in poorly motivated young people and parents.

* SR: Strength of recommendation (S = strong; W = weak; EO = expert opinion) (see page 9).
  QE: Quality of evidence (H = high; M = moderate; L = low; VL = very low).
Dietary approaches:
- Promote a healthy balanced diet:
  - based on healthy eating habits and
  - with a calorie intake corresponding to physiological needs.
- Traffic Light /Stop Light type diets

Reduction of sedentary activities
- Limit computer time to no more than two hours a day.

Physical activity
- Promote the inclusion of physical activity into daily activities (physically active lifestyle):
  - Promote activities enjoyable to the child or adolescent
  - Aim for a minimum of 60 minutes of moderately intense physical activity per day, ideally more.
  - Make sure to include endurance exercises (aerobics) and resistance exercises (body building).
- Adapt exercises and choice of activities to young people’s physical capacities and body type

Behaviour management:
- Use or teach a variety of specific techniques, including:
  - Setting realistic behavioural objectives
  - Self-monitoring and goal achievement
  - Controlling stimuli
  - Identifying personal barriers
  - Using rewards
  - Problem solving
  - Preventing relapses
  - Contingency planning
- Intervene or support parenting roles and family functioning:
  - Promote regular daily schedules (family meals, bedtimes)
  - Develop parenting skills
  - Develop or reinforce healthy role models
  - Facilitate authoritative parenting style

3 Several partners did not favour this approach.
Pharmacological Approaches

INESSS RECOMMENDS THAT:

R9- physicians working in primary or secondary care settings SHOULD NOT prescribe orlistat;  
S/Var

R10- physicians should consider prescribing orlistat only as part of specialized or highly specialized care, and only if:
A) Adolescents are already participating in a lifestyle intervention, AND
B) they present with:
   (i) severe obesity\(^4\) (BMI percentile ≥ 99.9% or BMI z-score ≥ 3.0) AND comorbidities or cardiometabolic risk factors, OR
   (ii) very severe obesity (BMI z-score ≥ 3.5);
W/Var

R11- physicians and other health and social service professionals treating adolescents with orlistat should include the following in their management strategies:
• Counselling on its side effects and how to reduce them,
• Dietary management with special attention to monitoring nutritional status, especially related to the risk of malabsorption,
• Monitoring the impacts of side effects, especially on adolescent’s psychological state and social functioning;
W/Var

R12- physicians SHOULD NOT prescribe metformin as an anti-obesity agent in the treatment of child and adolescent obesity;  
S/L

R13- physicians, pharmacists and other health and social service professionals SHOULD NOT recommend weight-loss products, such as appetite-suppressants and natural health products, for the treatment of child and adolescent obesity.  
S/L

* SR: Strength of recommendation (S = strong; W = weak; EO = expert opinion).
QE: Quality of evidence (H = high; M = moderate; L = low; VL = very low) (see page 9).
4 The selected criterion is the one found in the Canadian recommendations [Secker et al., 2010].
INESSS RECOMMENDS THAT physicians and other health and social service professionals, according to their respective fields of expertise:

R14- formulate intervention objectives jointly with the child or adolescent, and with his parents when appropriate, according to the age group and the context of the therapeutic relationship;  

R15- adapt intervention objectives so formulated to the child or adolescent (age, development stage, initial situation, capacities and interests, etc.) and to his family situation; 

R16- focus the intervention objectives primarily on the short- and long-term acquisition of positive health behaviours, mainly including healthy diets, physically active lifestyles and the reduction of sedentary activities with the goal of improving the child’s or adolescent’s health and well-being instead of centering these objectives only on weight change or target BMI; 

R17- should not always be expected to set a target weight as a therapeutic objective; 

R18- evaluate, when they set a target weight as a therapeutic objective, the appropriateness of communicating this information to young people or their parents in light of the specific therapeutic context of each situation; 

R19- focus on the following when they set a target weight: 

- a reduction of 0.5 or 0.25 in the BMI z-score at one year or, failing this, BMI stabilization, using the tools provided with the guidelines, or, if they can’t use the BMI z-score; 
- a reduction in weight gain, weight maintenance, or, in some cases\(^5\), gradual weight loss, according to young people’s age, physical development stage, and initial height and weight.

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* SR: Strength of recommendation (S = strong; W = weak; EO = expert opinion). 
QE: Quality of evidence (H = high; M = moderate; L = low; VL = very low) (see page 9). 
\(^5\) For example, severe obesity, comorbidity in young people who have reached their adult size, etc.
R20- provide the short term and longer term follow-up,
  • to monitor the outcomes of the intervention,
  • paying special attention to the onset of the treatment’s potential negative social or psychological side effects, mainly on eating habits, especially if the young people or parents feel that the intervention is not producing the expected outcomes, and
  • for the purpose of managing any detected comorbidities.

### 4- ORGANIZE AND MOBILIZE

**INESSS RECOMMENDS THAT:**

| R21- | lifestyle interventions should include at least 26 contact hours between the professionals and young people or their parents; | S/M |
| R22- | lifestyle interventions:  
  a) should include an intensive phase and a maintenance phase; and  
  b) should be carried out by interdisciplinary or multidisciplinary teams; | S/L |
| R23- | intervention arrangements (place, time, frequency, etc.) should be adapted, whenever possible, to the child or adolescent and his needs; | S/L |
| R24- | lifestyle interventions:  
  a) should last at least 6 months; and  
  b) should be carried out by networking available resources in the community; | W/L |
| R25- | child and adolescent obesity interventions should be part of a continuum of services that includes a component of action on the environmental and social determinants of healthy lifestyle habits. | W/VL |

* SR: Strength of recommendation (S = strong; W = weak; EO = expert opinion).  
QE: Quality of evidence (H = high; M = moderate; L = low; VL = very low) (see page 9).
**STRENGTH OF RECOMMENDATION (SR)**

Recommendations may be strong or weak. They may take either of two directions: to offer the intervention or NOT to offer the intervention. A recommendation may therefore be:

- **Strong (S)**
  - in favour of offering the intervention  
  - in favour of NOT offering the intervention
- **Weak (W)**
  - in favour of offering the intervention  
  - in favour of NOT offering the intervention

The strength of the recommendation is established by taking four factors into consideration:

1. the quality of the evidence both on efficacy and on safety
2. the balance between desirable and undesirable effects, determined primarily with regard to the participants’ expressed values
3. the level of uncertainty or variability in values and preferences
4. the wise use of resources [Guyatt et al., 2008].

The **QUALITY OF EVIDENCE (QE)** is classified as follows:

- **High (H)**: We are very confident that the true effect lies close to that of the estimate of the effect.
- **Moderate (M)**: We are moderately confident in the effect estimate: The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
- **Low (W)**: Our confidence in the effect estimate is limited: The true effect may be substantially different from the estimate of the effect.
- **Very low (VL)**: We have very little confidence in the effect estimate: The true effect is likely to be substantially different from the estimate of effect [Balshem et al., 2011].
- **Variable (Var)**: When the quality of the evidence taken into consideration differs for efficacy and safety, the overall quality is classified as variable.

Some recommendations are based on expert opinion more than on evidence and are therefore classified as **EXPERT OPINION (EO)**.
OBESITY IN CHILDREN AND ADOLESCENTS:
MAJOR COMPONENTS OF THE TREATMENT APPROACH
IN PRIMARY AND SECONDARY CARE

INTENSIVE TREATMENT
BY AN INTERDISCIPLINARY OR A
MULTIDISCIPLINARY TEAM

Minimum period of 26 hours including:
• dietary approach
• counselling and physical activity
• behaviour management techniques

EVALUATE
AND REFER

TREAT
OR GUIDE

MONITOR
AND SUPPORT

ORGANIZE AND
MOBILIZE

Head office
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PLAYTIME IS AN ESSENTIAL PART OF CHILDHOOD, but most children spend 4 to 5 hours a day doing sedentary activities. Although being overweight or obese is unhealthy for people of all ages, it is especially harmful to children because the habits developed as early as pre-K are often precursors to lifelong patterns. Childhood obesity is both a physical and mental health issue; it affects a child’s ability to socialize, learn, play, and develop a positive self-image.

Making small changes can have a dramatic effect on your entire family’s health. The following suggestions are from occupational therapy practitioners working with children and their families to become more healthy—while having fun.

### If you want to:

<table>
<thead>
<tr>
<th>Consider these activity tips:</th>
<th>An occupational therapy practitioner offers expertise to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a healthier lifestyle.</td>
<td>Make conscious decisions about your activities: Could you walk or bike instead of drive? Take the stairs instead of the elevator? Can your children safely walk or bike to school? (Refer to the national Safe Routes to School Program.) Dieting is a short-term action. For a lasting effect, focus on lifestyle activity changes that are feasible and achievable. Keep a healthy living journal and monitor your activities and associated mood and weight. This journal can help to identify trends and lifestyle choices that work for you and your family. Do not make drastic changes, which often lead to failure. Make a few small incremental changes that become habits before adding something new.</td>
</tr>
<tr>
<td>Make activity part of your family’s daily routine.</td>
<td>Encourage the activities your child enjoys (e.g., sports, dance) while reducing time in front of the TV or computer. Find fun things to do as a family, such as going to the park or playground, playing in the backyard, walking the dog, or hiking.</td>
</tr>
</tbody>
</table>
### If you want to:

<table>
<thead>
<tr>
<th>Consider these activity tips:</th>
<th>An occupational therapy practitioner offers expertise to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make mealtime a priority and opportunity for family participation.</td>
<td>Evaluate your home to help enhance comfort and safety in the kitchen: ensure that countertops and chair heights are appropriate, evaluate tools to be sure they are safe and comfortable for all users (and offer alternatives if they are not), evaluate efficiency and ergonomics, etc. By increasing safety and access, meal preparation, dinner time, and clean-up become easier and more enjoyable for all. Provide ways to engage all family members or increase socialization during meals. For example, the occupational therapy practitioner may suggest a “round-table” turn-taking discussion during dinner when each family member shares his or her favorite and least favorite part of each day, and be able to address barriers preventing this type of socialization.</td>
</tr>
<tr>
<td>Help ensure children are healthier in all aspects of their lives.</td>
<td>Contribute to bullying prevention and recess promotion school programs so all kids not only get the chance to exercise but feel comfortable doing so. Promote the value of recess to school administrators and suggest adapted or alternative activities so all children can participate. For example some students may enjoy walking, gardening, yoga, or dance rather than competitive or team sports.</td>
</tr>
</tbody>
</table>

### Need More Information?

Helping people achieve the things they want and need to do through therapeutic, meaningful, and enjoyable activity is the art and science of occupational therapy. Occupational therapy practitioners work with children in their homes, at school, in private practice, at children’s hospitals, and in other community locations, providing interventions that are individualized, appropriate, and effective. Ask your pediatrician or school administrator for a recommendation, or look online to find an occupational therapist in your area.

You can find additional information through the American Occupational Therapy Association at www.aota.org.
The effectiveness of occupational therapy in preventing childhood obesity in the school setting

Amy McLain
Pacific University

Follow this and additional works at: http://commons.pacific.edu/otpeds

Part of the Occupational Therapy Commons

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The effectiveness of occupational therapy in preventing childhood obesity in the school setting

Disciplines
Occupational Therapy

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The effectiveness of occupational therapy in preventing childhood obesity in the school setting

Prepared by: Amy McLain, OTS (mcla5242@pacificu.edu)
Date: 10/31/2011
Review date: November 2013

CLINICAL SCENARIO:
Childhood obesity, one of the most current issues of health education today, poses short and long-term effects on health and wellness. According to the Center for Disease Control (CDC) (2011) the numbers have more than tripled in the past 30 years, with more than 1/3 of children and adolescents being overweight or obese. CDC defines overweight in children by a body mass index (BMI) at or above the 85th and lower than the 95th percentile and obesity is defined as a BMI at or above the 95th percentile. Risk factors such as cardiovascular disease, high cholesterol, high blood pressure, prediabetes, bone and joint problems, sleep apnea, and psychological problems such as stigmatization and poor self-esteem increase for children with obesity (Adolescent and School Health, 2011). This population is 70-80% more likely to become overweight or obese as adults which enhances the risk of an obesity-related diagnosis (Haboush, Phebus, Ashby, Zaikina-Montgomery, & Kindig, 2011). In addition to clinical conditions, obesity significantly impacts physical, social, emotional, and school domains (Riazie, Shakoor, Dundas, Eiser, & McKenzie, 2010). These struggles experienced as children may lead to decreased self-esteem, self-worth, and confidence. Further, these experiences put individuals at risk for increased anxiety and sadness as adults, which may lead to mental illness or elevated engagement in risky behaviors (Sanderson et al, 2011; Strauss, 2000). This condition is an epidemic and poses economic concerns as well. According to a study in 2009 published in Medical News Today, 147 billion dollars is spent annually on the healthcare cost of obesity (Paddock, 2009). Regardless of a child’s ethnic background, economic circumstance, or environmental setting, obesity is of soaring concern.

Occupational therapists (OT) employed in the school system typically see children receiving special education services as directed by the Individuals with Disability Act (IDEA). School OTs caseloads consist of children who have been referred to special education by a parent or teacher, and then evaluated by an Individualized Education Plan (IEP) team, which includes an OT (Bober & Corbett, 2011). Goals include: academic and non-academic outcomes in social skills, math, reading, writing, recess play, self-help skills, participation in meaningful activities, and transitions (Bober & Corbett, 2011). Interventions commonly focus on handwriting, sensory-awareness/processing, gross/fine motor skills, and perceptual abilities (Barnes, Beck, Vogel, Grice, & Murphy, 2003). Although it is not written in the scope of OT practice to create prevention programs, specifically obesity in the school setting, OTs have the skills, imaginative tools, program development training, and holistic viewpoints of individuals to do so. As mentioned in the newest OT Obesity Position Paper, OTs voluminous areas of skills contribute to the practice of obesity through prevention and intervention techniques including diet and nutrition, exercise, behaviour modification and lifestyle changes (Clark, Reingold, Salles-Jordan, 2011). The purpose of this critically appraised topic is to determine the potential effectiveness that occupational therapy could have in preventing childhood obesity, particularly in the school setting.
FOCUSED CLINICAL QUESTION:
What is the effectiveness of occupational therapy on children with obesity in the school setting?

SUMMARY of Search, ‘Best’ Evidence’ appraised, and Key Findings:
A total of 6 research articles were analysed with information regarding childhood obesity in multiple settings, quality of life, risk of mental health in adulthood as a child with obesity, and the role of OT working with a population of children with obesity (specifically in the school setting). The following indicate the key findings from each paper:

- The qualitative and quantitative study by Munguba, Valdez, M.T., & Bruno Da Silva (2008) was chosen as the ‘best evidence’ because it highlights an OT intervention program for prevention of obesity within the school system. The study concluded that OT applying ‘play’ activities can be effective in a nutritional education program during the age in which children are gaining more autonomy in choosing food selection (8-10yrs).

- Pinhas-Hamiel, Singer, Pilpel, Fradkin, Modan, & Reichman (2006) found that most severely obese children/adolescents scored significantly lower in the emotional and school domains on the PedsQL questionnaire. Parents of obese children/adolescents scored significantly lower than their child in all categories (emotional, school, social, physical).

- Riazie, Shakoor, Dundas, Eiser, & McKenzie (2010) found no difference between ethnic backgrounds and obesity, but results simulated those by Pinhas-Hamiel, Singer, Pilpel, Fradkin, Modan, & Reichman (2006) in that children/adolescents with obesity scored lower than normal weight children in all domains of the PedsQL. Also, prepubescent obese children/adolescents achieved the poorest scores in the emotional domain.

- In a longitudinal birth cohort study, Emerson (2009) found that by age 3, children with developmental delay are more likely to be obese than their peers and the risk of obesity associated with developmental delay increased between 3-5 years of age. Therefore, there is a greater risk for obesity in children at risk for intellectual disabilities.

- A national survey conducted by Barnes, Beck, Vogel, Grice, & Murphy (2003) concluded that OTs are interested in a provision for children with emotional disturbances, but many do not feel competent working with that particular population. Obstacles stated for treating this population included: role confusion, limited knowledge base, lack of support from team, administrative factors, finding time to meet with the team, classroom issues and difficulties with parents.

- Sanderson, Patton, George C., McKercher, Charlotte, Dwyer, Terence, & Venn, Alison J. (2011) concluded that there is a correlation between being overweight in childhood and being at risk of a mood disorder in adulthood. In addition, women with obesity had a significantly higher prevalence of mood and anxiety disorders in adulthood than men.
CLINICAL BOTTOM LINE:
Children with obesity are at risk of feeling anguish from physical taunting and social stigmatization which may result in educational deficits and emotional uncertainties. This increases the risk for severe clinical, psychosocial, and mental illness in his/her future. In addition, these diagnoses result in millions of dollars in health expenses. Research shows that children as young as 3 years old may be at risk for obesity. Further research found that the emotional domains of children with obesity during the age of increasing autonomy have significantly poorer self-scores than those of normal-weight. OTs have knowledge in psychosocial, physical, environmental, and spiritual factors that allow them to effectively treat this clientele. School is where most learning is structured, planned, and executed and seems to be the most ideal location for acquiring good eating and exercise habits, therefore preventing social isolation, and the risk of future mental and psychosocial issues. With team collaboration and more formal education for OTs working with children that may be suffering secondary factors of obesity (e.g. emotional disturbance) OTs have the potential to create programs for the schools, with the goal of creating healthy habits and routines through education, play, and peer interaction, and in turn, benefit the occupational engagement of children.

Limitation of this CAT: This critically appraised topic has not been peer-reviewed and the author is not an expert in this area. The search is not exhaustive and has been conducted by a 2nd year MOT student as part of a class assignment.

SEARCH STRATEGY:

Terms used to guide Search Strategy:
- **Patient/Client Group:** Children with obesity
- **Intervention (or Assessment):** Occupational therapy
- **Comparison:** N/A
- **Outcome(s):** Quality of life for children with obesity; what effect does OT have in preventing obesity

<table>
<thead>
<tr>
<th>Database</th>
<th>Search Terms</th>
<th>Limits used</th>
<th>Helpful Articles</th>
</tr>
</thead>
</table>
| CINAHL (September, 2011) | “occupational therapy” and “schools”  
Results- 59 | Research article, 2000-2011 | Barnes, Beck, Vogel, Grice, & Murphy, (2003), *American Journal of Occupational Therapy* |
|                  | “occupational therapy” and “schools” and “obesity”  
Results- 1 | Research article, 2000-2011 | None helpful or appropriate                                                      |
|                  | “occupational therapy” and “schools” and “emotional disturbances”  
Results-1 | Research article, 2000-2011 | 1 repeat                                                                       |
|                  | “obesity” and “children with disabilities” | Research | Emerson (2008), *Public Health* |
### OVID (September, 2011)

<table>
<thead>
<tr>
<th>Search Term</th>
<th>Results</th>
<th>Reference/Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>“occupational therapy practice” and “obesity”</td>
<td>16</td>
<td>none</td>
</tr>
<tr>
<td>Results- 14</td>
<td></td>
<td>Mosely, Jedlicka, Lequieu, Taylor (2008), <em>OT Practice</em></td>
</tr>
<tr>
<td>“quality of life” and “obesity” and “child” and schools”</td>
<td>14</td>
<td>Pinhas-Hamiel, Singer, Pilpel, Fradkin, Modan, Reichman (2006), <em>International Journal of Obesity</em></td>
</tr>
<tr>
<td>Results- 5</td>
<td></td>
<td>Riazie, Shakoor, Dundas, Eiser, McKenzie (2010), <em>Health &amp; Quality of Life Outcomes</em></td>
</tr>
<tr>
<td>“mental health” and “childhood obesity”</td>
<td>34</td>
<td>Sanderson, Patton, McKercher, Dwyer, Venn (2011), <em>The Royal Australian &amp; New Zealand College of Psychiatrists</em></td>
</tr>
<tr>
<td>Results- 34</td>
<td></td>
<td>1 repeat</td>
</tr>
<tr>
<td>“occupational therapy” and “obesity” and “child or adolescent”</td>
<td>4</td>
<td>Munguba, Valdez, M.T., &amp; Bruno Da Silv (2008), <em>Occupational Therapy International</em></td>
</tr>
</tbody>
</table>

### INCLUSION and EXCLUSION CRITERIA

- **Inclusion:**
  - Childhood or adolescent obesity
  - Children with obesity and their quality of life
  - Mental health and obesity
  - Obesity prevention/interventions
  - OT role in school system
  - Year 2000-current
  - Research articles
- **Exclusion:**
  - Chronic secondary conditions
  - Adults with obesity as primary focus of study
  - Articles prior to 2000

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Prepared by Amy McLain, OTS (10.30.2011). Available at http://commons.pacificu.edu/otcats
**RESULTS OF SEARCH**

**Table 1: Summary of Study Designs of Articles retrieved**

<table>
<thead>
<tr>
<th>Study Design/ Methodology of Articles Retrieved</th>
<th>Level-PYRAMID CHART</th>
<th>Author (Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quasi-Experimental</td>
<td>II</td>
<td>Munguba, Valdez, &amp; Bruno Da Silva (2008)</td>
</tr>
<tr>
<td>Cohort (2)</td>
<td>III</td>
<td>Sanderson, Patton, McKercher, Dwyer &amp; Venn (2011); Emerson (2008)</td>
</tr>
<tr>
<td>Semi-structured Interview, direct and structural observation, focus group</td>
<td>NA</td>
<td>Munguba, Valdez, &amp; Bruno Da Silva (2008)</td>
</tr>
<tr>
<td>Survey</td>
<td>NA</td>
<td>(Barnes, Beck, Vogel, Grice, &amp; Murphy, 2003)</td>
</tr>
</tbody>
</table>

**BEST EVIDENCE**

The following study/paper was selected for critical appraisal. Reasons for selecting this study were:

- Only occupational therapy intervention in the school system found during search
- Highlights the effects that OT can have on implementing a prevention program in the school system
- Qualitative and quantitative information included

**SUMMARY OF BEST EVIDENCE**

<table>
<thead>
<tr>
<th>Table 2: Description and appraisal: The application of an occupational therapy nutrition education programme for children who are obese by Munguba, M.C., Valdez, M.T., &amp; Bruno Da Silva, C.A., 2008.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aim/Objective of the Study:</strong> The purpose of this study was to assess the impact of two interactive nutrition education games developed by occupational therapists on elementary students in a school setting. Behaviors, attitudes, and the amount and type of intermediation, the signs, tools, and languages within the subjects and their activities needed for learning, was observed during play and collected from the children during a focus group.</td>
</tr>
<tr>
<td><strong>Study Design:</strong> The study design included both qualitative and quantitative data. Qualitative data was collected with triangulation through semi-structured interview and direct and structured observation of the children by team members during play, and through focus groups following the study to collect children’s perception of learning.</td>
</tr>
</tbody>
</table>
nutritional concepts. The trained observers developed categories of observation following the study. Quantitative data collected through a quasi-experimental design simply to compare the two types of interactive games, a board game versus a video game, both based on the food pyramid. The qualitative data was looking to explain the student’s actual nutritional knowledge gained from participating in a game as well as their perception of what they learned and how they apply it in different areas of their lives. The quantitative data was used to compare the two games in varying categories (preference, attitudes, experience, intermediation, strategies used). The games were created with input by a team consisting of an OT, nutritionist, physician, and 23 undergraduate students in OT (12), nutrition (10), and social communication (1) all whom received education in learning strategies, intermediation, and nutrition education. The interprofessional group was chosen based on past research proposing that in school-based settings OTs interact with other professionals.

**Setting:**
The study took place in a public school in Fortaleza, Brazil in 2004.

**Participants:**
A convenient sample of 200 children comprised of 95 boys and 105 girls all ages 8-10 years old- the age children are typically gaining autonomy in food choices.

<table>
<thead>
<tr>
<th>Intervention Investigated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two interventions were used: an interactive board game and video game. Children partook in games weekly for 30min over a 4month period.</td>
</tr>
</tbody>
</table>

**Video:** This game encouraged children to organize a daily diet consisting of 6 healthy meals. Weight and height were entered at the beginning. As food appeared on the screen the child selected the specific diet for his/her meal and that selection was awarded a score based on the calories ingested. The child won if he/she built the correct diet according to his or her weight and height.

**Board:** This game also emphasized the construction of 6 daily meals and asked children to make decisions about the best form of establishing a healthy diet. Competition was stimulated between children and was aimed at obtaining the most suitable amount of calories (points). The child who formulated the best diet according to the food pyramid was declared the winner.

**Outcome Measures**
1. **Comparison variables:**
   a. Preference for game
   b. Experience with type of game
   c. Attitudes towards the game (winning, planning, competing, amusement)
2. **Attitudes observed during the games:**
   a. Analysis of the learning strategies applied: Metacognition: distribution of these attitudes and behaviors noted:
      - Analyses the strategies adopted & their effectiveness
      - Discusses strategies
      - Plans & establishes goals
      - Attentive to verbal hints
      - Uses the hints
      - Assesses the results
   b. Intrinsic motivation strategies: distribution of these attitudes and behaviors noted:
- Attentiveness to the challenges of game
- Tries new strategies after ‘failing’
- Becomes irritated after ‘failing’
- Shows happiness after ‘succeeding’
- Becomes irritated when the session finishes

c. Attention strategies

3. Analysis of the Intermediation used:
- 1st: offering instructions, 2nd: demonstrating, 3rd: offering hints, 4th: performing the task jointly

4. Comparison categories
a. Possibility of learning while playing
b. Fantasy during the learning process
c. Learning the concepts of nutritional education (Focus group)
d. Intermediation needed (Focus group)

Main Findings:

The following outcome measures with significance are listed below in these adapted tables. Additional relevant findings, although not significant, are also mentioned.

Comparison Variables:
At the beginning of the study, the preference was the video game, likely due to the previous experiences and accessibility to technology versus board games. Following the 4 weeks, children preferred the board game due to the competitiveness it offered between students.

<table>
<thead>
<tr>
<th></th>
<th>Board Game</th>
<th>Video Game</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preference (difference significant*)</td>
<td>6%</td>
<td>27%</td>
</tr>
<tr>
<td>Previous Experience</td>
<td>N/A</td>
<td>80.5% preferred video game</td>
</tr>
<tr>
<td>Attitudes triggered by games:</td>
<td>Competition*</td>
<td>Winning* Planning* Amusement*</td>
</tr>
</tbody>
</table>

Statistically significant (*) = <0.005


Significant attitudes observed during the games:
The therapists observed these attitudes most significantly through both of the games:

<table>
<thead>
<tr>
<th>Metacognition strategy</th>
<th>Analyses the strategies adopted &amp; their effectiveness, plans &amp; establishes goals, assesses the results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrinsic Motivation strategy</td>
<td>‘shows happiness after succeeding’</td>
</tr>
<tr>
<td>Attention Strategy</td>
<td>Level of attention high: video game (70.5%) &amp; board game (63%)</td>
</tr>
</tbody>
</table>

Statistically significant (*) = <0.005


Analysis of the intermediation used:
Within the 4 levels of intermediation (1: offering instructions, 2: demonstrating, 3: offering hints, 4: performing the task jointly), the 1st and 3rd levels were observed most
frequently, with the 3rd level being significant in the board game, likely due to lesser prior experience with the board game.

<table>
<thead>
<tr>
<th>Board Game</th>
<th>Video Game</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st level: offering instructions</td>
<td>41.5%</td>
</tr>
<tr>
<td>3rd level: offering hints</td>
<td>20.5%*</td>
</tr>
</tbody>
</table>

Statistically significant (*) = <0.005


**Comparison Categories:**
- **Possibility of learning while playing:** 65% affirmed learning while playing
- **Fantasy during the learning process:** children assumed the role of the character, talking in 1st person; e.g. “I haven’t eaten any fruit today yet”

**Focus Group:**
- **Learning the concepts of nutritional education:** They mentioned learning to select foods, even with habits persisting: “when I go to the grocery store, I still buy pastry, but I know that a banana is better.” Also, they showed that they had learned to use the available foods: “At the grocery store there’s a little of everything and we can eat well with little money”. Food groups were expressed as a new learning as well: “I learned that we have to eat a little of each kind of food.”
- **The need for help in learning (intermediation):** help from both students and the therapist were accepted and even requested. The observer’s recorded: “It’s so good to learn with our friends, to organize our diet!”, “I don’t know what to include in my lunch! Can you help me?”

**Original Authors’ Conclusions**
The author concluded that occupational therapists applying a play activity involving nutritional concepts can be an effective intervention. This type of play through interactive games developed by occupational therapists can promote nutritional learning for children who are obese. Additional research needs to be done in health education that emphasizes the autonomy of children in learning nutritional concepts through play, as well as focusing attention on the impact of family on learning nutrition.

**Critical Appraisal/Validity:**
This study was created to identify a strategy that would help children create healthy habits as a prevention of obesity. Both qualitative and quantitative data was used with a major focus on the qualitative data. A limitation of this study was that the sample size was chosen conveniently; therefore only 1 school setting was of focus, suggesting complications for generalizing results. In addition, the study did not include the body size of the subjects, making it unclear if they were normal weight or children with obesity. The majority of this study was qualitative and therefore, a theoretical framework should have been mentioned for each question. Replication of this study would be difficult for different evaluators because the criteria for formation of the categories after observation were not described in thorough. The study was approved by the Ethics Committee for Research in Human Beings of the Universidade de Fortaleza, but it was not mentioned if parental consent was obtained. No comments were mentioned about the study’s rigour, but a wide array of data collection was obtained. A long-term effect of this intervention is difficult to predict, as a cohort study would be beneficial to see sustainability of the learning module through the sample’s body weight over time.
Summary/Conclusion:
The invention of play activities developed by occupational therapists for the purpose of a learning activity has been shown through this research study as effective. In addition to results on the preference of game, observations and information from focus groups focused on behaviors and attitudes of intermediation, internal motivation, and social participation. According to Guimaraes and Bouruchovitch (as sited in Munguba, Valdez, M.T., & Bruno Da Silva, 2008) intrinsic motivation is an affective learning strategy related to involvement and motivation that enhances self-esteem, a key trait at this age. Autonomy and responsibility is also increasing and through playful learning strategies, generalizability of healthy habits into reality is possible. Occupational therapists can incorporate motivating, educational, fun, and skill developing activities to implement healthy habits and routines. In addition, they can educate other professionals on implementation of play activities for nutrition education for continuing results.

Characteristics of included studies

Study 1: Emerson (2008)

Intervention Investigated: This longitudinal birth cohort study aimed to examine the relationship between obesity and child gender, family socio-economic circumstances and area deprivation for children at age 9mo (inclusion criteria- receiving child benefit), 3yrs., and 5yrs. with and without developmental delay in the UK.

Comparison Intervention: This design was a cohort study with pre and post- test over a period of time, therefore no intervention group was involved.

Outcomes used:
- Cognitive measures (<3% of weighted distribution of age-related norm data on 2 different tests were identified as developmentally delayed)
- Weight
- Height
- Material hardship at each wave (9mo, 3 yrs., 5 yrs.)
  Wave 1: number of consumer durables not present in household
  Wave 2/3: number of essentials from a list of 9 that were unaffordable
- Area deprivation

Findings: Findings were consistent with previous literature in that older children and adults with intellectual disabilities are significantly at a heightened risk for obesity compared with non-intellectually disabled children. The risk of obesity among children with developmental delay was particularly high among less severely delayed children, and children not exposed to material hardship. Inequalities in child obesity are potentially an important contributing factor to adult health, which emerge in early childhood.


Intervention Investigated: Cross-sectional design in 2 settings- hospital vs. community. Study examined self report of health-related quality of life measures using the PedsQL by children (normal weight and obese) ages 7-16. A parent-proxy was given to evaluate their child and compared scores to their child.

Comparison Intervention: The study was a one-time survey study. Therefore, no comparison intervention group was involved.

Outcomes used:
- BMI calculated with measurements of height & weight
- Questionnaire consisted of 23 items in 4 domains: physical, emotional, social, and school
Findings: The study concluded that the physical domain had the greatest negative correlation with BMI, followed by social, school, & emotional. There were significantly lower scores in the obese quartile than the normal weight quartiles for emotional and school domains. Children with higher BMI scores had progressively decreased social and physical scores than those with lower BMI. Obese children in the hospital had lower QOL scores in all domains compared to the obese children in the community. Parents of obese children reported consistently lower QOL, whereas parents of normal weight children scored similar to their parents.

Study 3: Riazie, Shakoor, Dundas, Eiser, & McKenzie (2010)
Intervention Investigated: Cross-sectional study measuring Health Related Quality of Life (HRQoL) using the PedsQL questionnaire in a mixed-ethnic clinical sample of obese children and adolescents (ages 5-16yrs).
Comparison Intervention: The study was a one-time survey study. With the HRQoL results, comparison of obese and healthy controls, as well as obese according to pubertal status were examined.
Outcomes used: -BMI calculated with measurements of height & weight
-Questionnaire consisted of 23 items in 4 domains: Physical, emotional, social, and school
-pubertal status
Findings: This study concluded that mixed-ethnic samples of children and adolescents with obesity report a significantly lower HRQoL scores than controls of normal weight. In addition, this study demonstrated that pre-pubescent obese children report poorest in emotional functioning.

Study 4: Sanderson, Patton, McKercher, Dwyer & Venn (2011)
Intervention Investigated: The purpose of this cohort study was to examine the association between overweight and obesity in childhood (7-15) with mood, anxiety, and substance use disorders 20 years later in young adulthood (26-36)
Comparison Intervention: This design was a cohort study with pre and post- test over a period of time, therefore no intervention group was involved.
Outcomes used:
Childhood measurements:
- Height
- Weight
- Age, socio-economic status, feelings of loneliness, depression, boredom, upset due to criticism, alcohol intake, general health status with a single item, and number of minutes of physical activity in past week
Adult measurements:
- Mood disorder, anxiety, and substance use disorder
- Marital status, educational attainment, employment status, current daily smoker versus not, any live birth in women versus non, physical health component summary scale, total minutes in the past 7 days engaged in leisure, occupational, commuting, and household/yard activity
Findings: This study concluded that adjusted for age and sex, overweight children were at a significantly greater risk for a mood disorder in adulthood than non-overweight children. When not adjusted for sex, women were found to be at greater risk for mood disorder when taking into account adult weight, concluding that resolution of childhood overweight may be especially important to girls. It is important to reduce the prevalence of childhood overweight & obesity and to promote mental
health and create prevention programs among overweight & obese children and adolescents.

Study 5: Barnes, Beck, Vogel, Grice, & Murphy (2003)

Intervention Investigated: The purpose of this qualitative study was to collect survey data from OT’s working in the public school system on services provided to children with emotional disturbances, as well as the perceived appropriateness, extent, and types of services provided.

Comparison Intervention: A survey was sent across the nation to randomly selected school OT’s derived from the AOTA School System Special Interest list. Therefore, no intervention took place.

Outcomes used:
- Questions pertaining to work location and percentage of students with a diagnosis of emotional disturbance on caseloads
- Performance areas & components addressed & treatment approaches used
- Views of school OT for children with emotional disturbances
- Views about educational preparation
- Obstacles to school occupational therapy for children with emotional disturbances

Findings: This study concluded that OT’s in the school system could provide services to students with emotional disturbances. Some OT’s responded that OT should work directly with psychosocial components of this disability whereas others thought OT should work with these students only if another performance deficit is apparent. Sensory intervention is the most common among responders. Further efforts in continuing education may enhance OT’s ability to provide services for this population. Future research is needed to explore sensorimotor intervention with children with emotional disorders as well as EBP for psychosocial occupational therapy in school systems.

IMPLICATIONS FOR PRACTICE, EDUCATION and FUTURE RESEARCH

Childhood obesity is on the rise in America, and as healthcare professionals with holistic viewpoints and ability to create wellness programs, OTs have the skill set to develop interventions that could potentially reverse the childhood obesity epidemic. There is currently limited literature on interventions for prevention of obesity, however many articles were found with effective treatments for children currently with obesity (e.g. exercise, diet). Very limited research was found particularly concerning occupational therapy and childhood obesity prevention. However, literature was found concerning a community-based program for children with obesity. Kugel (2010), interested in the obesity epidemic, reported on the development of a 7-week healthy lifestyle program, created through the lens of the PEO model, at a Boys and Girls club with middle school girls. Feedback following the program was exceptionally postive and empowering, as stated from the girls (Kugel, 2010). Recommendations from this particular program could be implemented within the school, the ideal setting where learning is structured, planned, and executed on most days of the week and peers are involved. Using previous research and developing programs, OT students have the opportunity to implement and improve childhood obesity prevention programs through an IEP project. Furthermore, professionals can create a continuing education course focusing on the impact OT can have in preventing obesity.

Munguba et al (2008) found that through ‘play’ the students learned healthy eating habits, a key factor in preventing obesity. Limitations persisted within the study but highlighted that utilization of OT expertise and intervention approaches can be of high value in preventing obesity. However, one area of health and wellness was of focus
(nutrition) leaving many factors unaccounted for (behavior modification, exercise, etc.). These, in addition to nutrition, are areas within the OT domain. Surplus articles retrieved concluded a decrease in the quality of life in children with obesity and an increase in the risk for a mental health diagnoses as adults. This information is imperative for supporting the motive of creating a holistic prevention program. Evidence has proven a strong relationship between three highly focused areas of OT: occupation, health, and well-being (Hasselkuss, 2002). Evidence of possible outcomes of childhood obesity has been revealed, and OT has the ability to create motivating and occupation-based prevention interventions.

Implementing a wellness program in the school setting could benefit not only those at risk for obesity, but all students of normal weight and those at risk for psychosocial issues. Implications for this goal are large, because the role of OT in the school is limited to working with children who present with an IEP. In addition, OTs caseloads are high and pressures already exist for providing adequate care (Barnes et al, 2003). This, however, does not undermine the effects in which OT could have on creating programs within the school setting. Within IDEA regulations and through collaboration, communication, and consultation with teachers, administration, and other team members, OTs could use expertise and leadership to either create and implement an activity/program, promote healthy lifestyles, or indulge in research to enhance the rigor of OT’s role in preventing obesity.

Finally, additional research needs to be completed on current childhood obesity programs as well as forthcoming school interventions to provide evidence-based OT practice in preventing childhood obesity, and therefore, secondary factors.
REFERENCES


