Obesity and Weight Concerns in Children with Special Needs in a Developing Country

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ABSTRACT

Objective

To investigate weight concerns in children with special needs.

Methods

Data from an established patient database on Microsoft Excel for a local community paediatric service was analysed for September 2015 to August 2016. Patient diagnoses were categorised as follows: Attention Deficit and Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), Learning Difficulty (LD), Cerebral Palsy (CP), Global Developmental Delay (GDD), Trisomy 21 (T 21) and Other syndromes. The proportions of these children being overweight/obese, underweight, having eating problems, requiring dietician services and having behavioural problems were recorded. Odds ratios were calculated comparing subgroups.

Results

One thousand and seventeen (1017) patients attended the clinics; Seven hundred and seventy one (771) were male. Fifteen point four percent (15.4%, 157) of patients had weight concerns, with 9.3% (95) being overweight or obese and 6.1% (62) underweight. Five point one percent (5.1%, 52) of children experienced eating problems. Seven point nine percent (7.9%,80) patients accessed the dietician services and behavioral concerns were noted in 8.8% (90) patients. Regarding ASD, the odds of being overweight or obese was lower compared to the rest of the group; 3.7% (15) were overweight or obese. For ADHD, 15% (13) were overweight or obese. Amongst children with Learning Difficulty, 17.5% (44) were overweight or obese. CP children had higher odds of being underweight compared to the rest of the group (14.9% of children with CP were underweight). For Trisomy 21 and other syndromes, 17% (5) were overweight or obese.

Conclusion

International data indicates that children with special needs have high rates of overweight and obesity. This study also shows that a significant proportion of children with special needs are overweight or obese and at risk of Non-Communicable Diseases (NCDs) like cardiovascular

disease and diabetes. Strategies implemented locally to address NCDs must give emphasis to children with special needs.

Keywords: Obesity, Special Needs, Children

INTRODUCTION

According to the World Health Organization (WHO), there were nearly 41 million children under five years old who were considered overweight or obese in 2016.[1] Additionally, a recent study, led by the Imperial College London and the WHO, published in *The Lancet* in October 2017, notes that the number of obese children and adolescents (aged five to nineteen years) worldwide has risen tenfold in the past four (4) decades.[2] The Centers for Disease Control and Prevention (CDC) in the United States of America (USA) stated that the prevalence of obesity is 17% and 12.7 million children and adolescents in the USA are affected.[3]

In Trinidad and Tobago, a cross-sectional study to determine the prevalence of obesity and other risk factors for type 2 diabetes among school children in Trinidad, showed that 15% of children were obese and 17% were overweight.[4]

The CDC (USA) noted that 20% of children aged 10 to 17 with special needs are obese compared with 15% of children of the same ages without special needs. [5] Currently, there is no data regarding obesity and overweight in children with special needs in Trinidad and Tobago. The World Health Organization (WHO) states that NCDs are chronic diseases of "long duration which are the result of a combination of genetic, physiological, environmental, and behavioral factors"; the main types of NCDs are cardiovascular disease, cancers, chronic respiratory disease and diabetes.[6] Obesity is a significant risk factor for NCDs like diabetes and cardiovascular disease and would impact the long-term quality of life of children with special needs if they develop these conditions.

The National Strategic Plan for the Prevention and Control of Non-Communicable Diseases: Trinidad and Tobago 2017–2021 sates, "…ultimately, the high level of overweight and obesity beginning from childhood and continuing into adulthood further contributes to the overall increased risk of NCDs in the population." The plan broadly addresses childhood obesity; it highlights the social determinants of health and the need for multisectoral collaboration, equity, a human rights and culturally-sensitive approach, but it does not address specifically the child with special needs.[7]

This study aims to show the necessity for increased focus of public health on obesity, especially with regards to children with special needs.

METHODOLOGY

Five (5) specialty community paediatric clinics exist within the South-West Regional Health Authority (SWRHA) of Trinidad and Tobago. Morbidity data is collected on an ongoing basis using a Microsoft Excel spreadsheet. Data from September 2015 to August 2016 was analysed using an Excel spreadsheet. Odds ratios were also utilized to analyse subgroups within our sample; a P- Value of $P < 0.05$ was considered statistically significant.

The patients were grouped based on their diagnosis as follows: Attention Deficit and Hyperactivity Disorder (ADHD), Autism Spectrum Disorder (ASD), Learning difficulty (LD), Cerebral Palsy (CP), Global Developmental Delay (GDD), Trisomy 21 and Other Syndromes. The Merriam-Webster dictionary definition of "special needs" was utilised for the purpose of this study: "Special needs refer to any of various difficulties (such as physical, emotional, behavioral, or learning disability or impairment) that causes an individual to require additional or specialized services or accommodations (such as in education or recreation)."

Growth parameters were assessed using the WHO growth standards.[8] For children less than five years, Overweight was defined as a BMI Z-score between +2 to +3, and Obesity, a BMI Z-score of more than Z +3. For children more than five years, Overweight was defined as a BMI Z -score between Z +1 to +2, and Obesity a BMI Z-score of more than +2. Underweight was defined as a BMI Z-score between Z -2 and Z -3, and Severely Underweight, a BMI Z- score of less than Z -3.

Morbidity data collected included being obese/overweight, underweight, having behavioural problems and eating problems. Information on access to the social welfare

grants, special school placement, dietician and child protection concerns were also recorded.

RESULTS

There were 1362 patient visits with 314 new patient visits and 1048 scheduled review visits. A total of 1017 patients attended the clinics as detailed in Table 1 below. Patients' ages ranged from 1 to 22 years old. 771 patients were male. There was a higher proportion of males in each diagnostic group; in the ADHD, ASD and CP groups more than 75% of patients were male. 48% (488) of patients were in the 5 to 10 years age group.

ASD had the highest prevalence within the clinic at 39.8% (405) with learning difficulty (24.7%) (252) being the second most common diagnosis as illustrated in Table 2 below. ADHD had an 8.5% (86) prevalence rate.

Behavioural issues were recorded in 9% (90) of the study population (N=1017); 22% (19) of ADHD, 9.6% (39) of ASD and 7.1% (18) of LD. The odds of behavioural problems were higher in the ADHD group compared to the rest of the group (OR 3.4; 95% CI 1.9-6.3; P=0.0001).

Table 1. Age and Gender Distribution in Diagnostic groups.

Diagnosis	0-5yrs Male	0-5yrs Female	5-10yrs Male	5-10yrs Female	>10yrs Male	>10 yrs Female	Total
ADHD	4	2	48	8	22	2	86
ASD	121	26	146	41	60	11	405
CP	30	6	17	6	12	3	74
LD	10	13	85	47	66	31	252
GDD	58	15	51	24	21	2	171
T 21	2	0	4	5	0	0	11
Other syn-dromes	3	5	5	1	2	2	18
Total	228 (22.4%)	67 (6.6%)	356 (35%)	132 (13%)	183 (18%)	51 (5%)	1017

Table 2. Diagnostic Groups and various morbidities.

Diagnostic Group	Total	Overweight	Underweight	Eating problems	Behavior concerns	Dietician	Child protection concerns	Welfare grant	Special school placement
ADHD	86	13	4	3	19	11	1	27	9
ASD	405	15	14	29	39	26	2	131	65
CP	74	2	11	0	0	8	0	39	12
LD	252	44	9	8	18	17	1	85	66
GDD	171	16	21	12	12	18	2	111	46
T 21	11	2	1	0	0	0	1	8	11
Other syndromes	18	3	2	0	2	0	1	7	2

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Of the 1017 patients, 157 (15.4%) were noted to have weight concerns with 9.3% (95) of them being overweight or obese, and 6% (62) of patients being underweight. Figure 2 shows the proportions of children who were overweight and underweight within each diagnostic group.

Children with learning difficulty had higher odds of being overweight compared to the rest of the group (OR 3; 95% CI 1.9 to 4.6; P 0.0001). The likelihood of being overweight in Trisomy 21 and other syndromes compared to the rest of the group was higher but not statistically significant (OR 2; 95% CI 0.7 to 5.5; P 0.14). Children with ADHD also had a higher likelihood of being overweight when compared to the rest of the group but was not statistically significant (OR 1.8; 95% CI 0.98 to 3.4; P 0.06). Nine point three (9.3%) of children with GDD were overweight- this was similar to the rest of the group (OR 1; 95% CI 0.6 to 0.99).

Children with ASD had a lower likelihood to be overweight compared to the rest of the group (OR 0.25; 95% CI 0.14 to 0.4; P 0.0001). Children with Cerebral Palsy were more likely to be underweight compared to the rest of the sample (OR 3; 95% CI 1.5 to 6.1; P 0.002). In ASD, the proportion of kids being overweight versus underweight was similar at 3.7% (15) and 3.4% (14) respectively. Children with ADHD, LD and Trisomy 21 were more likely to be overweight than underweight.

Eating problems were only recorded in 52 (5.1%) children. This number is less than that of children who were underweight (62 or 6% of the sample) and overweight/obese (95 or 9.3% of the sample). It is likely that there were more eating problems than were actually recorded. The majority of patients with eating problems were in the ASD group (2.9% (29) of the sample and 7.1% (29) of the ASD group). The odds ratio of eating problems in the ASD group compared to the rest of the

Figure 1. Proportion of various diagnoses in the clinic.

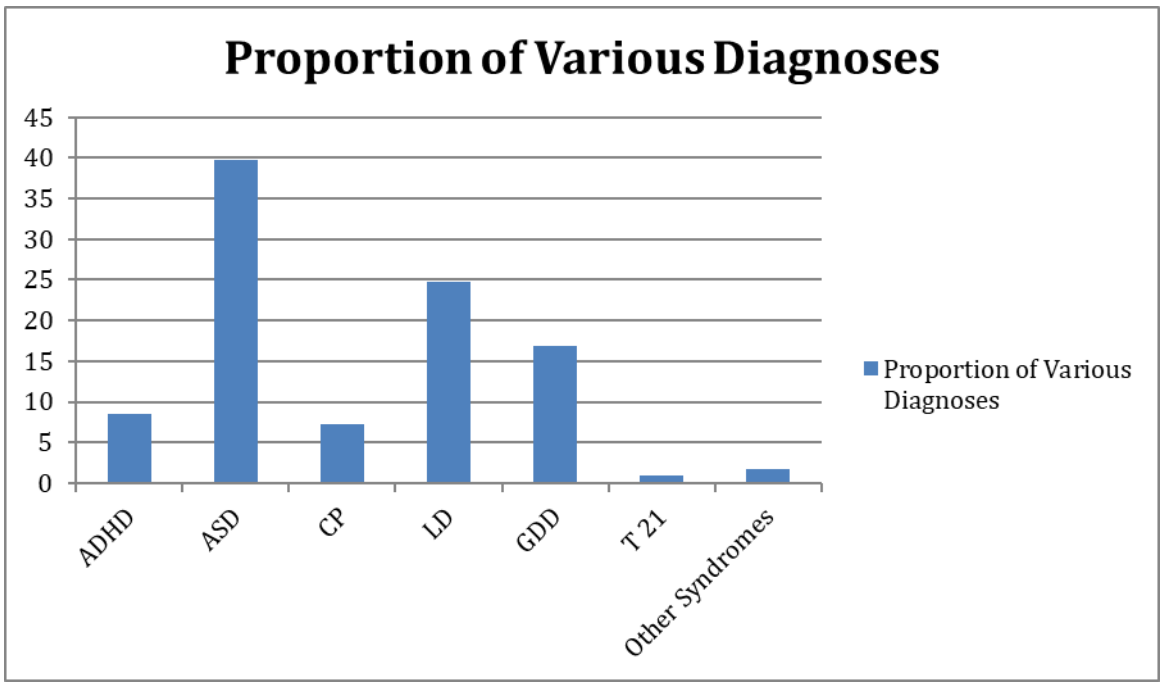
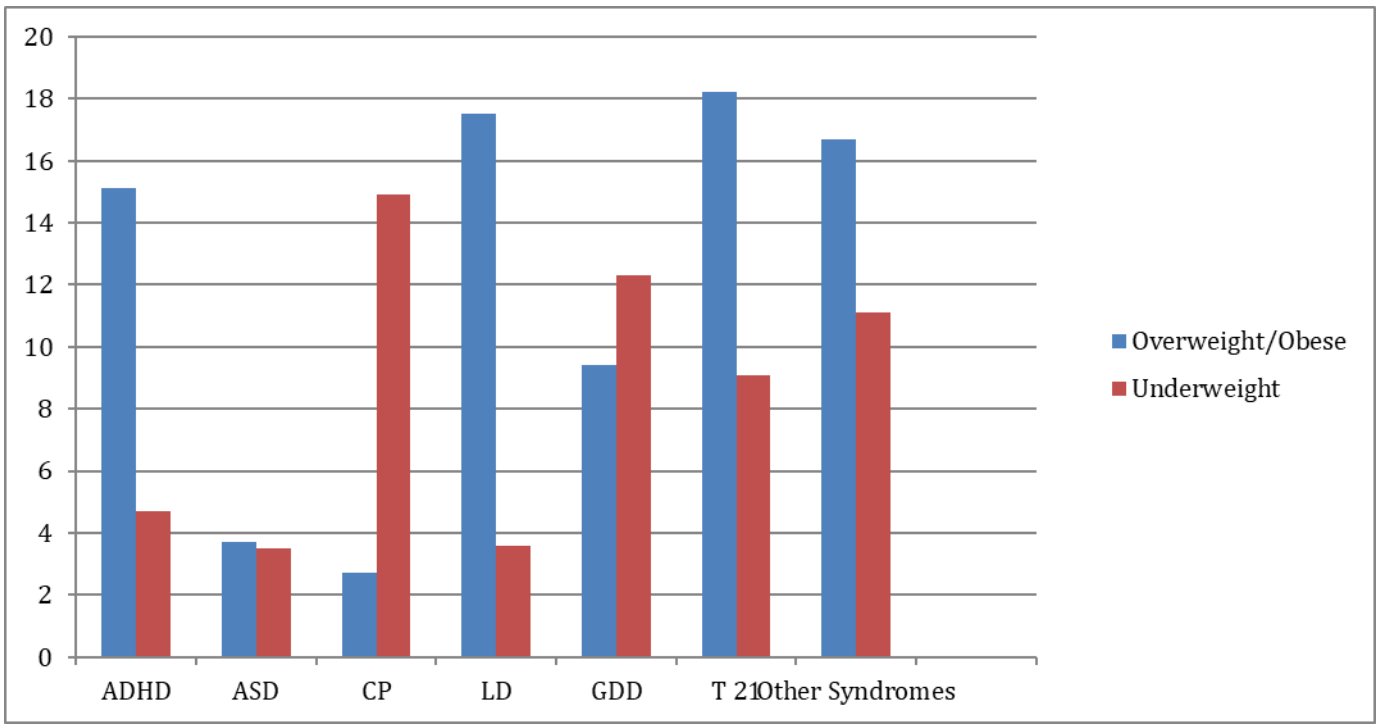


Figure 2. Proportion of Overweight/Obese and Underweight children based on diagnosis



group was high (OR 1.97; 95% CI 1.12 to 3.46; P 0.017). Of the children with ASD and eating problems, 90% accessed the dietician. Overall, 67% of the children with eating problems accessed the dietician.

Overall, 40% of children were receiving welfare support. Children with Cerebral Palsy had a higher likelihood to receive the welfare support compared to the rest of the group (OR 1.9; 95% CI 1.2 to 3.1; P 0.006). In less than 1% of children, child protection concerns were noted. Twenty one percent (21%) of children attended a special school.

DISCUSSION

Obesity can significantly impact quality of life due to the risk of NCDs, especially cardiovascular disease and diabetes. This impact is even greater when the persons have special needs. The CDC has recognised that children and adults with mobility limitations, intellectual or learning disabilities are at greatest risk for obesity; from the 2003-2008 National Health and Nutrition Examination Survey, obesity rates for children with disabilities were 38% higher than for children without disabilities.[5]

There is no recent data in Trinidad and Tobago on the exact number of children with special needs, developmental problems or disabilities in the paediatric population. In 1984, the Report of a National Survey of Handicapped Children and Youth in Trinidad and Tobago identified the estimated prevalence of children with special needs aged 3 to 16 years as being 16.1% of the population. A UNICEF Eastern Caribbean report stated that Trinidad and Tobago's 2000 Census reported 1.1% of children 0 to 18 years of age with a disability;[9] this figure is very likely to be an underrepresentation since, currently, Autism Spectrum Disorder by itself may be at least 1% of the population. The CDC figures indicate that about 17% of children aged 3 to17 years may have some form of a developmental disability.[10]

The Community Paediatric Service of the SWRHA is responsible for assessing and managing children who have developmental concerns; almost 90% of referrals are for developmental concerns. We looked at weight concerns in children attending the clinics but there was no well child comparison group. The proportions of children with overweight or obesity, however, were large in the various diagnostic categories but less when compared to the general population.[4] Children with learning difficulty, ADHD, Down Syndrome, Global Developmental Delay and other syndromes all had high rates of obesity ranging from 9.4% to 18.7%.

Interestingly, in the ASD group, which had the highest prevalence (29.7% (405) and the highest rates of eating problems (7.1% (29)), the proportion of overweight or obesity was low at 3.7% (15). Underweight children with ASD were also low at 3.0% (14). Hill et al in their article on Obesity and Autism indicated that overweight in children with autism was as high as 33.6% and obesity 18%.[11] A National Sample of US Adolescents with Autism and Other Learning and Behavioral Disorders showed that adolescents with autism were twice as likely to be obese compared to peers without disability; the study also showed that 31.8% of the children with autism were obese.[12] Further research would be needed to understand why the rates detected in our sample were lower than international data. Ninety percent (90%) of the ASD children with eating problems accessed the dietician; this may have had an impact on their weight parameters. Data regarding access to Occupational Therapy for eating concerns was not determined. This is an area where further research is required. Some children with ASD and eating problems in our sample may have had a normal BMI; further research would be needed to explore this issue.

A literature review by Bertapelli et al regarding obesity in children with Down Syndrome showed obesity rates ranging from 23% to 70%.[13] In our study, 18.7% of children with Down Syndrome were overweight. Children with cerebral palsy in our sample were more likely to be underweight. We did not collect data regarding whether the children were ambulatory or non-ambulatory. Hurvitz et al showed that ambulatory patients with cerebral palsy were more likely to be obese than non-ambulatory patients.[14] In a Norweigan study, Dahlseng et al showed that children with cerebral palsy who had gastrostomy tubes for longer had higher BMIs.[15] In our sample, none of the children had gastrostomy tubes—this may be a possible reason for the higher rates of underweight.

A National Sample of US Adolescents with Autism and Other Learning and Behavioural Disorders showed that the percentage of obesity in adolescents with ADHD was

17.6% and 19.8% for adolescents with Intellectual disability.[12] Our study showed that 15% (13) of children with ADHD and 17.4% (44) with LD were overweight or obese. Children with Learning difficulty comprised the second largest group in our review (18.5% (252)) and these children were more likely to be overweight compared to the rest of the sample.

Other factors which may contribute to obesity in children with special needs but not addressed in this study include physical constraints, lack of accessible environments to exercise, challenges with chewing or swallowing food, medications which can contribute to weight gain and sleep problems.

CONCLUSION

Our study shows that children with special needs have a significant risk for childhood obesity. The complications of obesity would undoubtedly affect quality of life since they would be at risk of NCDs like cardiovascular disease and diabetes. National policy regarding non-communicable disease and obesity should give particular attention to children with special needs.

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