

OVERWEIGHT AND OBESITY IN COMMUNITY WITH DOWN SYNDROME

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(Original scientific paper)

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Abstract

Objectives: What is the prevalence of overweight and obesity in people with Down syndrome in Kosovo, which age group has the highest prevalence of overweight and obesity, which gender of people with Down syndrome is most affected by overweight and obesity. Study designs: The study was conducted in 31 cases (20 males and 11 females) of Down syndrome with age ranging from 2 years to 40 years. Participants were grouped into 3 age groups: children 2-12y (16 participants), adolescents 12-18y (9 participants) and adults 18 + y (6 participants). The participant's weight and height were measured using digital weighing scale and stadiometer. Then statistical data processing was done and BMI (Kg / m²) was calculated according to the IOTF classification. Results: The outcome of our research shows that the prevalence of overweight is 22,6%, while the prevalence of obesity is 25,8%. Analysis by age groups shows that the prevalence of overweight at children is 18,8% and obesity is 12,5%, at adolescent the prevalence of overweight is 22,2% and obesity is 33,3%, at adults the prevalence of overweight is 33,3% and obesity is 50%. The analysis of our outcome on gender basis shows that the prevalence of overweight for female is 18,2% and obesity 45,5%, while prevalence of overweight for male is over 25,0 % and obesity 15,0 %. There were no significant differences among age group and among male and female. Conclusion: From the analysis of the result of our research we can conclude that the prevalence of overweight and obesity in the community with Down syndrome is high and in approximate values with other countries of the world. Although we did not have a significant difference in overweight and obesity by gender, female had a higher percentage of obesity. Our study showed that the BMI for community with Down syndrome progressively increased with age, however the difference was not statistically significant. Continuous BMI measurements and early diagnosis of overweight are very important.

Key Words: Down syndrome, Body mass index, overweight, obesity

Introduction

Down syndrome is the most common syndrome in the world, 1 in 691 births. According to the Down Syndrome Kosovo Association data, around 35-40 babies with Down syndrome are born in Kosovo within the year, while the total number of individuals with Down Syndrome in Kosovo is over 920. (Down Syndrome Kosova)

Down syndrome is also affected by variety of health disorders like congenital heart diseases, thyroid dysfunction, celiac diseases, eye problem and dementia etc. (Cullum & Liebman, 1969; Prasher, 1999)

Adolescents with Down syndrome are more likely to be obese than other adolescents with intellectual disability. Some of physiological factors that fosters the development of obesity in this population are: hypothyroidism, decreased resting metabolic rate and increased leptin levels. (Artioli 2017; Krause, Ware, McPherson, Lennox & O'Callaghan, 2016)

Many studies said that the Down syndrome cases usually lead sedentary life. (Jobling & Cuskelly, 2006). In all Down syndrome cases the major difficulty encountered is lower muscle tone. Hypotonia may make physical activity more difficult and also prevents them from doing effective exercise thereby increasing the muscle mass and also it is more difficult to speed up their metabolism. (Barr & Shields, 2011)

Some studies conclude that obesity in children affects motor skills and motor coordination. (Castetbon & Andreyeva, 2012; Lopes, Stodden, Bianchi, Maia & Rodrigues, 2012; Slining, Adair, Goldman, Borja & Bentley, 2010).

Obesity in DS, as well as among the general population, raises the risk for dyslipidemia, insulin resistance, type 2 diabetes and hypertension. (Murray & Ryan-Krause, 2010)

Based on the above researches, we have set the goals of this study:

- What is the prevalence of overweight and obesity in people with Down syndrome in Kosova
- Which age group has the highest prevalence of overweight and obesity,
- Which gender of people with DS is most affected by overweight and obesity.

Material & methods

The study was conducted in 31 cases (20 males and 11 females) of Down syndrome with age ranging from 2 years to 40 years. Participants were grouped into 3 age groups: children 2-12y (16 participants), adolescents 12-18y (9 participants) and adults 18 + y (6 participants).

The study was conducted at the Down Syndrome Center in Prizren, the study involved all people with SD who received therapeutic services at that center.

The participant's weight and height were measured using digital weighing scale and stadiometer. Then statistical data processing was done and BMI (Kg / m²) was calculated according to the IOTF classification.

Results

The study was conducted in 31 cases (20 males and 11 females) of Down syndrome with age ranging from 2 years to 40 years. Participants were grouped into 3 age groups: children 2-12y (16 participants), adolescents 12-18y (9 participants) and adults 18 + y (6 participants).

The outcome of our research shows that the prevalence of overweight is 22,6%, while the prevalence of obesity is 25,8%. (Table 1.)

Table 1. Age_class * IOTF Classification Crosstabulation

			IOTF Classification				Total
			Normal	Obese	Overweight	Underweight	
Age_class	2-12 y children	Count	10	2	3	1	16
		% within Age_class	62,5%	12,5%	18,8%	6,3%	100,0%
	12-18y adolescent	Count	4	3	2	0	9
		% within Age_class	44,4%	33,3%	22,2%	0,0%	100,0%
	18 + y adults	Count	1	3	2	0	6
		% within Age_class	16,7%	50,0%	33,3%	0,0%	100,0%
Total		Count	15	8	7	1	31
		% within Age_class	48,4%	25,8%	22,6%	3,2%	100,0%

Analysis by age groups shows that the prevalence of overweight at children is 18,8% and obesity is 12,5%, at adolescent the prevalence of overweight is 22,2% and obesity is 33,3%, at adults the prevalence of overweight is 33,3% and obesity is 50%. (Table 1.)

Table 2. Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5,941 ^a	6	,430
Likelihood Ratio	6,613	6	,358
N of Valid Cases	31		

There were no significant differences among age group. (Table 2.)

The analysis of our outcome on gender basis shows that the prevalence of overweight for female is 18,2% and obesity 45,5%, while prevalence of overweight for male is over 25,0 % and obesity 15,0 % (Table 3.)

Table 3. Age_class * IOTF Classification * Gender Crosstabulation

Gender				IOTF Classification				Total	
				Normal	Obese	Overweight	Underweight		
M	Age_classes	2-12 y children	Count	8	1	3		12	
			% within Age_class	66,7%	8,3%	25,0%		100,0%	
		12-18y adolescent	Count	3	0	1		4	
			% within Age_class	75,0%	0,0%	25,0%		100,0%	
		18 + y adults	Count	1	2	1		4	
			% within Age_class	25,0%	50,0%	25,0%		100,0%	
	Total	Count	12	3	5		20		
		% within Age_class	60,0%	15,0%	25,0%		100,0%		
	F	Age_classes	2-12 y children	Count	2	1	0	1	4
				% within Age_class	50,0%	25,0%	0,0%	25,0%	100,0%
12-18y adolescent			Count	1	3	1	0	5	
			% within Age_class	20,0%	60,0%	20,0%	0,0%	100,0%	
18 + y adults			Count	0	1	1	0	2	
			% within Age_class	0,0%	50,0%	50,0%	0,0%	100,0%	
Total		Count	3	5	2	1	11		
		% within Age_class	27,3%	45,5%	18,2%	9,1%	100,0%		
Total		Age_classes	2-12 y children	Count	10	2	3	1	16
				% within Age_class	62,5%	12,5%	18,8%	6,3%	100,0%
	12-18y adolescent		Count	4	3	2	0	9	
			% within Age_class	44,4%	33,3%	22,2%	0,0%	100,0%	
	18 + y adults		Count	1	3	2	0	6	
			% within Age_class	16,7%	50,0%	33,3%	0,0%	100,0%	
	Total	Count	15	8	7	1	31		
		% within Age_class	48,4%	25,8%	22,6%	3,2%	100,0%		

There were no significant differences among male and female. (Table 4.)

Table 4. Chi-Square Tests

Gender		Value	df	Asymp. Sig. (2-sided)
M	Pearson Chi-Square	5,278 ^b	4	,260
	Likelihood Ratio	4,914	4	,296
	N of Valid Cases	20		
F	Pearson Chi-Square	5,610 ^c	6	,468
	Likelihood Ratio	6,702	6	,349
	N of Valid Cases	11		
Total	Pearson Chi-Square	5,941 ^a	6	,430
	Likelihood Ratio	6,613	6	,358
	N of Valid Cases	31		

Discussion

The outcome of our research showed that the prevalence of overweight is 22,6%, while the prevalence of obesity is 25,8%.

Analysis by age groups in our study shows that the prevalence of overweight and obesity at community with Down syndrome progressively increased with age however the difference was not statistically significant.

Our results showed that the age groups 2-12y (children): 18,8% were overweight and 12,5% were obese. Basil et al, (2016) showed that the onset of obesity in children with Down syndrome often occurs before 2 years of age. Zemel et al, (2015) suggest that pre-pubertal overweight DS children have high levels of leptin, which correlates with increased body mass index and degree of adiposity.

Our results showed that the age groups 12-18y (adolescent): 22,2% were overweight and 33,3% were obese. These results are close to the results of the study conducted by Basil et al, (2016) where 22.4% were overweight and 47.8% were obese, they also showed that children tended to have stable BMI z-scores throughout childhood and adolescence with a slight increase after puberty. Different from our results, in the study of Magge et al (2019) 64% of youth with DS was overweight. Our results on overweight and obesity in the adolescent group by gender show that 25% of men were overweight, had no obesity and 20% of women were overweight and 60% of women were obese.

Analysis of our results in adolescents by gender shows that overweight in our study was close to being overweight in three other studies, while the obesity value of female adolescents in our study was higher compared to the other three studies. (Myreliid, Gustafsson, Ollars & Annerén, 2002; Selvi et al, 2017; van Gamen-Oosterom et al, 2011).

At the age groups +18y (adult): 33,3% are overweight and 50,0% are obese. Our results on overweight and obesity in the adult group by gender show that female and male had high results of overweight and obesity, where 25% of male were overweight and 50% of male were obese, while 50% of females were overweight and 50% of them obese. So all adult women were overweight or obese.

Analysis of our results in general by gender shows that 25% of male were overweight and 15% of male were obese, while 18.2% of female were overweight and 45.5% of women were obese.

The limitations of this study are the small number of people with Down syndrome included.

Conclusions

From the analysis of the result of our research we can conclude that the prevalence of overweight and obesity in the community with Down syndrome is high and in approximate values with other countries of the world. Although we did not have a significant difference in overweight and obesity by gender, female had a higher percentage of obesity. Our study showed that the BMI for community with Down syndrome progressively increased with age, however the difference was not statistically significant.

Although people with DS have some physiological conditions that predispose them to excess body fatness, we should try to reduce the impact of environmental factors.

Health professionals must educate on healthy lifestyle habits at an early age and promote physical exercise. Continuous BMI measurements and early diagnosis of overweight are very important.

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