

Comparisons of the Health Related Quality of Life between normal and overweight adolescents

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Abstract

Background: In order to know the effect of overweight condition on Health Related Quality of Life (HRQOL) in adolescents, it is necessary to compare the HRQOL of overweight adolescents to that of normal adolescents.

Aim: To compare the Health Related Quality of Life between normal and overweight adolescents.

Methodology: A cross sectional comparative study was conducted amongst 203 adolescents of schools and junior colleges in Nagpur. All the students ranging from 15 to 17 years of age and willing to participate were considered. Anthropometric data of the participants was collected which included their name, age, gender, height and weight. BMI of the participants was calculated in percentile using the Department of Health and Human Services Centre for Disease Control and Prevention table for children. Then the participants were provided with the KIDSCREEN-27 questionnaire.

Result: Overweight condition has a negative impact on the Health Related Quality Of Life in adolescents aged 15 to 17 years in the dimensions of physical well-being, psychological well-being, autonomy and parents, peers and social support, school environment.

Keywords: BMI Percentile, Kids screen 27, HRQOL.

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1. Introduction

Overweight condition is usually measured in terms of Body Mass Index (BMI). [1] A child or adolescent having BMI of 85th percentile to <95th percentile is considered to be overweight. [2] It is important to examine the effect of overweight condition on all aspects of functioning and thus the quality of life of an individual specially that of adolescents as they will soon contribute to the society as mature adults. In order to know the effect of overweight condition on Health Related Quality of Life (HRQOL) in adolescents, it is necessary to compare the HRQOL of overweight adolescents to that of normal adolescents. [3] The KIDSCREEN is a generic questionnaire, designed to measure subjective HRQOL in children and adolescents. [4] The KIDSCREEN-27 consists of five Rasch scaled dimensions:

- 1) Physical well-being (5 items)
- 2) Psychological well-being (7 items)
- 3) Autonomy and parents (7 items)
- 4) Peers and social support (4 items)

- 5) School environment (4 items)

Validity and reliability of KIDSCREEN-27: the construct validity of the instrument is satisfying. The calculation of factor analysis explains 56% of the variance. The reliability of each of the 5 dimensions Cronbach's Alpha is >0.70

2. Materials and methods

2.1 Study Design:

Cross sectional study

2.2 Sampling Technique:

2.2.1 Type of sampling:

Convenient sampling

2.2.2 Method of selection:

Schools and junior colleges were selected purposely considering convenience and feasibility.

2.2.3 Subjects:

All the students ranging from 15 to 17 years of age and willing to participate were considered.

2.2.4 Inclusion Criteria:

Adolescents (both genders aged between 15 to 17 years) Those willing to participate. BMI of the subjects ranging from 5th percentile to less than 95th percentile i.e. normal to overweight adolescents.[5]

2.2.5 Exclusion Criteria:

Adolescents suffering from neurological disorders, cardiorespiratory conditions and musculoskeletal disorders. Those with physical disabilities preventing or affecting the anthropometric measures BMI of the subjects ranging from 95th percentile or above i.e. obese adolescents.[3,5]

2.3 Methodology

The requisite permission was obtained from the Head of the Institute, Ethical committee and Principals of the schools targeted. An information sheet was provided to all the participants to be filled as for the researcher's ease to carry out the study. The study was explained to the participants and written consent was obtained from them and their parents one day prior to the beginning of the study. Anthropometric data of the participants was collected which included their name, age, gender, height and weight. Once this was done BMI of the participants was calculated in percentile using the Department of Health and Human Services Centre for Disease Control and Prevention table for children. [6]

Percentile Ranking	Weight Status
Less than 5 th percentile	Underweight
5 th percentile to less than 85 th percentile	Healthy weight
85 th percentile to less than 95 th percentile	Overweight
Equal to or greater than the 95 th percentile	Obese

Then the participants were provided with the KIDSCREEN-27 questionnaire. Adequate time of 15 minutes was given. Each item is scored on a 5 point ordinal scale where 1= not at all (never), 2 = a little (slightly; seldom), 3 = moderately, 4 = much, 5 = very much (extremely).

The total score is generated by summing up all item responses. Higher scores indicate better HRQOL while lower will indicate poor HRQOL.[4]

Data was coded by UID numbers and entered in the Microsoft Excel Sheet 2013 Data was analysed in a statistical software STATA, version 10.1, 2011.

Dimension wise results

Table 3: Section 1 – Physical activities and health

Question	Overweight	Healthy	t-value	p-value
In general, how would you say your health is?	2.47± 0.72	4.17 ± 0.69	16.6869	<0.0001,HS
Since last week have you felt fit and well?	2.73 ±0.71	4.21 ±3.63	3.35908	0.0006,HS
Since last week have you been physically active?	2.71 ± 0.70	4.00 ± 0.92	10.5462	<0.0001,HS
Since last week have you been able to run well?	2.61± 0.65	4.27 ±0.78	15.4967	<0.0001,HS
Since last week have you felt full of energy?	2.68 ±0.77	4.28 ±0.77	14.2592	<0.0001, HS
Total score	13.22± 2.46	20.95 ±4.60	13.4950	<0.0001,HS

The above table and graph shows the physical activities and health between normal and overweight adolescents in which Q1 to Q5 shows that the overweight

2.4 Statistical Analysis

Mean and Standard Deviation were calculated to summarize quantitative variables such as BMI, Age, KIDSCREEN-27 scores by dimensions

Frequency and percentage were calculated to summarize categorical variables such as: Gender, Weight categories (normal and overweight), 5 Rasch dimensions. It was used to test the significance of difference between normal weight and overweight adolescents.

Two independent sample t-tests were used to compare the difference in the mean scores of two groups. Chi square test was used to compare the difference in proportions of two groups. $p < 0.05$ was considered statistically significant for all comparisons.

3. Result

A cross sectional comparative study was conducted amongst 203 adolescents aged 15 to 17 years from schools and junior colleges in Nagpur.

Table 1: Age Distribution

Age in years	No. of subjects	Overweight	Healthy
15	83	31	52
16	84	33	51
17	12	24	24
Total	203	76	127

31 were overweight and 52 were normal weight. 84 adolescents being 16 years old with 33 were overweight and 51 were normal weight. 48 adolescents being 17 years old in which 24 were overweight and 24 were normal weight.

Table 2: Gender Distribution

Gender	No. of subjects	Overweight	Healthy
Male	107	47	60
Female	96	29	67
Total	203	76	127

The above table and graph shows that a total of 203 adolescents were involved in the study out of which 107 were males and 96 were females. In the male population, 47 were overweight and 60 had normal weight. In the female population, 29 were overweight and 67 had normal weight.

adolescents have significantly lower scores of physical activities and health since the past week indicating that overweight adolescents are physically less active.

Table 4: Section 2 – General mood and feelings about yourself

Question	Overweight	Healthy	t-value	p-value
Has your life been enjoyable?	2.90 ±0.78	4.14±0.82	11.4074	<0.0001,HS
Have you been in a good mood?	2.97 ± 0.74	4.27 ± 0.76	11.8528	<0.0001,HS
Have you had fun?	3.31 ±2.30	4.33 ± 0.84	4.4889	<0.0001,HS
Have you felt sad?	3.09 ±0.78	2.02 ±0.69	10.0846	<0.0001,HS
Have you felt so bad that you didn't want to do anything?	2.82 ±0.92	1.86 ±0.79	7.8572	<0.0001, HS
Have you felt lonely?	2.71 ± 0.96	1.58 ± 0.79	9.0475	<0.0001,HS
Have you been happy with the way you are?	2.22 ± 0.82	4.30 ± 0.79	17.8481	<0.0001,HS
Total score	20.05± 3.00	22.52±2.45	6.3860	<0.0001,HS

The above table and graph indicates the general mood and feelings of normal and overweight adolescents (since last week) which shows that in Q1 to Q3 and Q7

overweight adolescents have lower scores than the normal adolescents while in Q4 and Q6 overweight adolescents have greater scores as compared to normal adolescents.

Table 5: Section 3 – Family and free time

Question	Overweight	Healthy	t-value	p-value
Have you had enough time for yourself?	2.65± 0.74	3.53±1.06	6.3124	<0.0001,HS
Have you been able to do the things that you want to do in your free time?	2.68 ± 0.76	3.66 ±1.07	6.9514	<0.0001,HS
Have your parents had enough time for you?	3.27 ± 0.88	4.14± 0.88	6.7169	<0.0001,HS
Have your parents treated you fairly?	3.40 ± 0.94	4.55± 0.74	9.6620	<0.0001,HS
Have you been able to talk to your parents when you wanted to?	3.22 ± 1.04	4.36± 1.01	7.6707	<0.0001, HS
Have you had enough money to do the same things as your friends?	2.46 ±0.91	3.29± 1.23	5.0852	<0.0001,HS
Have you had enough money for your expenses?	2.35 ±.00	3.36± 1.30	5.7930	<0.0001,HS
Total score	20.06± 3.35	26.91±4.09	12.2943	<0.0001,HS

The above table and graph shows the scores of the family and free time related questions (since last week) which reveals that they are lower in overweight adolescents

for all the questions than the normal weight adolescents suggesting that the overweight adolescents are affected in this dimension.

Table 6: Section 4 – Friends

Question	Overweight	Healthy	t-value	p-value
Have you spent time with your friends?	3.15 ±0.85	4.41 ± 0.84	10.2964	<0.0001,HS
Have you had fun with your friends?	3.10 ±0.87	4.59 ±0.72	13.0464	0.0006,HS
Have you and your friends helped each other?	2.81 ±0.94	4.60± 0.64	15.9964	<0.0001,HS
Have you been able to rely on your friends?	2.48 ±0.90	4.18 ± 0.79	14.0407	<0.0001,HS
Total score	11.56±2.82	17.80±2.26	17.2691	<0.0001,HS

The above table and graph shows the dimension of friends in which the overweight adolescents have significantly lower scores than the normal weight

adolescents from Q1 to Q4. Thus, this indicates that overweight adolescents have affected quality of life in friends and autonomy category.

Table 7: Section 5 – School and learning

Question	Overweight	Healthy	t-value	p-value
Have you been happy at school?	3.22 ±.86	4.38 ±0.67	10.6738	<0.0001,HS
Have you got on well at school?	2. ±0.86	4.09 ±0.75	9.7298	<0.0001,HS
Have you been able to pay attention?	3.0 ± 0.78	4.14 ±0.86	9.4518	<0.0001,HS
Have you got along well with your teachers?	3.17± 0.82	4.25 ± 0.87	8.7730	<0.0001,HS
Total score	12.36± 2.25	16.88±2.05	14.6034	<0.0001,HS

The above table and graph shows the school and learning dimension between the normal weight and overweight adolescents which indicates that the overweight adolescents have lower values than the normal weight in all the questions i.e. Q1 to Q4 of this dimension suggesting affected social life and thus quality of life in this dimension.

overweight group were found in all the dimensions of the questionnaire.

4. Discussion

The result suggests a positive association between severity of excess body weight and low quality of life. Significant affection in the HRQOL scores of the IJBAR (2019) 10 (5)

Section 1 – Physical Activity and Health, the reason being that overweight adolescents tend to show sedentary life.[5] This is because of increased body weight, that the muscles require more energy to carry heavy bodies resulting in increased expenditure of energy causing muscle fatigue ultimately leading to muscle pain.[7]

A similar study performed by Karen C. Swallen, Eric N. Reither and others at the University of Minnesota on school students from 7th to 12th grades in February 2005

reported a statistically significant relationship between overweight and general and physical health.[8] Another cross sectional study named Overweight and Health Related Quality of Life in adolescents of Florianopolis, Southern Brazil was done including 467 adolescents aged 15 to 18 years enrolled in a public school in the city and studied their HRQOL on using Paediatric Quality Of Life Inventory (PedsQOL) 4.0 in which the overweight and obese adolescents had the lowest scores in the physical domain.[9]

Section 2 – General Mood and Feelings About Yourself (in Q4, Q5 and Q6) revealed that the adolescents in the overweight group felt more sad, lonely and dispirited than the normal weight adolescents. This is because adolescents have constant concern about their body weight envisaging an ideal of beauty, imposed by the lean and slender body type. Non acceptance of ones' own body can make adolescents feel socially marginalized.[6]

Asma Parveen N, Dr Sheila John *et al* published a cross sectional study on the Health Related Quality Of Life among adolescents in the International Journal of Advanced Research And Development in 2017 by comparing the normal weight and overweight girls ranging from 18 to 20 years in Chennai, India. The assessment tool was SF-36. The results indicated that the difference in the mean mental health score between both the groups was statistically significant. [10]

In **Section 3 – Family and Free Time**, (Q1 AND Q2) the overweight individuals because of their weight concerns become lonely, have poor self-perception of physical appearance and hence, prefer for sedentary or isolated activities and lower preference for social activities.[11] Due to these issues they are unable to concentrate on their academics as well as extra-curricular activities when alone even in their free time. Also, family habits influence the child (Q3, Q4 and Q5). Studies have shown that living in a single parent household or with a family where parents have tension between each other or living with family members who knowingly or unknowingly disrespect the child's physical appearance in any form (even verbal), such children or adolescents tend to interact less with their parents about their problems due to the fear of non-acceptance. This may lead them to feel that they are not being treated fairly by their parents.[6]

A study carried out by Sahar A. Khairy *et al* compared the HRQOL of the overweight and normal weight groups in 2016 using the PaedsQL and reported that low socio economic status was encountered as the highest percentage in overweight and obese adolescents.[12]

Overweight adolescents face social undermining towards stereotypical body image issues which may result in body shaming. Also, ignoring the overweight and obese adolescents from important group discussions and leaving them feeling left out results in such individuals having less or no friends and trust issues. Results from the study on

'The impact of overweight and obesity on HRQOL in childhood' by Nora Wille *et al* published in December 2008 for children and adolescents aged 6 to 18 years reported that the Friends Dimension of the KINDL^R questionnaire had lower scores and was significantly affected in the overweight group.[13]

Section 5 – School and Learning revealed that the overweight adolescents have difficulty in paying attention because of negative body image issue resulting in low self-esteem thus affecting their learning abilities. Childhood overweight and obesity has been found to have a negative effect on the school performance.[6] A study done by M D Tsiros *et al* on the HRQOL in overweight and obese children and adolescents using PaedsQL questionnaire reported that there was a significant impairment in the social functioning domain.[14]

5. Conclusion

Overweight condition has a negative impact on the Health Related Quality Of Life in adolescents aged 15 to 17 years in the dimensions of physical well-being, psychological well-being, autonomy and parents, peers and social support, school environment.

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