

## A Comparative Study of Self-Concept of Healthy, Overweight, and Obese Adolescents

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### Abstract

Body weight has become a major concern in current adolescents group. Thus, this study intended to examine adolescents of different body weights regarding their belief in themselves and their self-evaluation. Based on their body weight, adolescents were categorized into healthy (body mass index=17-24.9), overweight (body mass index=25-29.9), and obese (body mass index above 30). A survey was conducted on 350 adolescents in the age group of 14-17 years. A proforma containing socio-demographic details and self-perception profile for adolescents was used to collect the data. Obtained results were analyzed using one-way ANOVA and the post hoc Tukey test. The results indicated that out of 9 areas of self-perception, significant differences were found in 6 areas (scholastic competence, athletic competence, physical appearance, behavioral conduct, close friendship, and global self-worth). Thus, this implies that body weight affects the self-perception of adolescents. The study can have leading implications as to how increased body weight tends to harm the belief in self-efficacy of an adolescent

**Keywords:** Rehabilitation, PNF Technique, Hamstring pliability, Recreational Badminton Player, Sports Physiotherapy. Body weight, self-perception, overweight, body mass index, adolescents

### 1. Introduction

Adolescence is a span of development that commences with puberty (10-12 years of age) and ends with maturity in both physiological and neuro-biological areas, as demonstrated in neuro-scientific research which prolongs to age 20 (APA, 2023). It is a time for promoting physical and mental health and developing the personality of the individual. Adolescent health comprises of transformations within multiple domains like physical, social, psychological, emotional, cognitive, and intellectual. The all-round development in these domains occurs at different degrees and is reflected the holistic development of the adolescent. These differences in growth can put an adolescent at a likelihood for risk taking behaviors and emerging mental health issues. It is a period where home, school and other environmental influences can impact not only health but also long-term health.

Weight is considered an important indicator of health. Both over and under-weight can lead to a plethora of physical and mental health issues. Body Mass Index (BMI) is one of the oft-used criteria for assessing optimal weight (CDC, 2022) and the same has been used in this study.

Body mass index is a person's weight in kilograms fractionated by the square of height in meters. Normal/Healthy weight ranges from 18.5-24.9; overweight ranges from 25-29.9 and obese >30.

In addition to physical changes, psychological changes also emerge in adolescents. These changes occur due to advancements in cognitive, intellectual, social, environmental, and emotional domains. One such transition occurs in an adolescent's self-perception. Self-perception is defined as the ability to view and evaluate oneself in comparison to the cohort. Adolescence is the developmental stage where all round development of the personality takes a spurt. They undergo many dilemmas and confusions during this phase of development. Their capability to think about the possibilities and to reason more theoretically will explain further how the 'self' differs in adolescence. As Harter (2012) explained- adolescents have discrepancies about themselves and how they explain their self. They might consider themselves outgoing but at the same time also withdrawn, happy yet moody, and smart but clueless. This explains that their personality and behavior change with whom and where

they are. This change could shake their beliefs and they might feel like an imposter. This raises the question of “who exactly am I?” As self-concept modifies, so does self-esteem. Besides changes in physical, social, appearance domains, Harter (2006) also added changes in perceptions of romantic relationships, jobs, and close friendships. Self-esteem decreases as advancement in school education increases. Although this decrease in self-esteem is merely temporary, unless there are some serious conflicts with family or friends. Self-esteem escalates around late adolescence and in early adulthood when one is confident in peer relationships, appearance, and physical education.

When self-perception is studied with body weight, it is often related to body image of the adolescent as it is an essential component of the complex mechanism of one's own identity. Its subjective component refers to an individual's satisfaction with their body size and body parts (Gardner, 1996). When body weight and body image are studied, it is often found that overweight relates to high dissatisfaction in body image and healthy body weight relates to satisfaction and increased self-perception of an adolescent.

Research has revealed a conflict between ideal beauty standards and general physique and the weight that it carries in modern society. These discrepancies and strictness in the socio-cultural environment seem to play a role in the formation of subjective body image disorders, prejudices, and distortions.

## **2. Review of Literature**

Since the major progression of obesity occurred in the 1900s (Komlos et al. 2010), there has been tons of research that concludes self-perception differs in adolescents who have varying body weight. It is different for healthy adolescents, overweight adolescents, and obese adolescents.

Liu et al (2022) studied the relationship between self-esteem and weight status of young adults. Study included 127 college juniors and seniors, and they answered questions about their weight, height, grade, sleep quality, nutritional behavior, lifestyle, self-esteem, and risk of eating disorders. Results of the study revealed that high self-esteem was negatively associated with unhealthy weight (overweight or obese). They concluded that self-esteem has significant positive relationship with healthy weight.

Meland et al (2021) examined how self-esteem, body mass, body concerns, and self-rated health are combinedly affected in early adolescence. They used self-rated health, self-esteem, and body mass index as primary outcomes on 1225 students in a longitudinal cohort study. Results indicated that body and weight concerns significantly affected self-rated health and self-esteem, both of which had appropriate effects on each other. High body mass index pertains to have adverse effects on self-rated health but reduced effects on self-esteem.

Kyeongra et al. (2014) examined the association between actual body weight and self-perceived weight and how perception affects weight management attitudes. 642 late adolescents aged between 16-19 years from a National Survey (2009-2010) were included in the sample. The survey comprised of socio-demographic variables, and self-perception questionnaire. Results indicated that girls perceived their weight correctly than boys. Also, accurate weight perception was significant in overweight and obese adolescents.

Another research by Shivani et al (2013) examined the association between self-perception and obesity in 18-21 years old first-year doctorate students from Maulana Azad Medical College, New Delhi. They used self-report inventories like short version of Physical Self-Description Questionnaire (PSDQ-S), P300 evoked potentials (to assess cognition) and academic performance (marks obtained in science subjects). Results revealed that body mass index, cognition and self-perception had no relationship between them. In addition to this, no significant relationship was found between gender. Therefore, it was concluded that other factors like academic achievement might nullify the effects on physical self-concept and cognition which might appear later in life.

## **3. Methodology**

**Sample:** A descriptive survey was conducted across schools in Jaipur. A sample size of 350 students was taken and the inclusion criteria for all was 14-19 years of age, day-scholars studying in English medium schools. They were administered on a battery of standardized psychological tests.

Tools used:

- Pro-forma- containing socio-demographic details like age, gender, weight, height, grade, school, exercise status, diet preference and mode of education (single/co-ed).
- Self-perception Profile for Adolescents- Harter -2010. The scale consists of 45 items along with 8 specific domains and 1 separate domain known as Global Self-Worth subscale. The 8 domains in order are namely: scholastic competence, social competence, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth. All the items were answered using a “structured alternative format” to counteract the propensity to answer socially desirable responses and to present the participants with a range of response choices. Higher the means scores obtained on the domain, more will be characteristic of that domain

After the administration of the test, the adolescents were put into categories based on their body mass index.

#### Data analysis:

The obtained data was analyzed using descriptive statistics and one-way anova. All the analysis was done using IBM-SPSS software version 29.

**Table 1:** *Socio-Demographic characteristics of the participants (N=350)*

Characteristics		n	%
Gender	Male	181	51.7
	Female	169	48.3
Grade	IX	44	12.6
	X	85	24.3
	XI	105	30
	XII	116	33.1
Category	Heathy	165	47.1
	Overweight	113	32.3
	Obese	72	20.6
Exercise	Yes	184	52.6
	No	166	47.4
Diet	Vegetarian	186	53.1
	Non-Vegetarian	164	46.9
School	Co-Education	221	63.1
	Single	129	36.9

## 4. Results

The following section reports the findings from the analysis of the data.

**Table 2:** *Means and Standard Deviation of Self-perception domains of healthy, overweight, and obese adolescents.*

Variables	Healthy n = 165		Overweight n = 113		Obese n = 72	
	M	SD	M	SD	M	SD
Scholastic Competence	2.64	.41	2.47	.44	2.28	.55
Social Competence	2.64	.42	2.60	.42	2.19	.61
Athletic Competence	2.51	.38	2.51	.41	2.25	.57
Physical Appearance	2.46	.40	2.47	.49	2.15	.69

Job Competence	2.60	.37	2.58	.39	2.40	.50
Romantic Appeal	2.53	.43	2.51	.46	2.06	.53
Behavioral Conduct	2.62	.36	2.63	.43	2.28	.48
Close Friendship	2.36	.42	2.42	.37	2.13	.52
Global Self-Worth	2.70	.41	2.58	.51	2.25	.78

From Table 2, it was clearly seen that out of the 9 domains of self-perception scale, there were differences on 6 domains which are further analyzed using ANOVA and the post hoc.

A. The domains which showed difference on mean values are-

Scholastic Competence-Healthy adolescents had high mean on the domain of scholastic competence ( $M= 2.64$ ,  $SD = .41$ ) as compared to overweight adolescents ( $M= 2.47$ ,  $SD = .44$ ) and obese adolescents ( $M= 2.28$ ,  $SD = .55$ ). Job Competence- Healthy adolescents had high mean on the domain of job competence ( $M= 2.60$ ,  $SD = .37$ ) as compared to overweight adolescents ( $M= 2.58$ ,  $SD = .39$ ) and obese adolescents ( $M= 2.40$ ,  $SD = .50$ ). Close Friendship- Overweight adolescents had high mean on the domain of close friendship ( $M= 2.42$ ,  $SD = .37$ ) as compared to healthy adolescent ( $M= 2.36$ ,  $SD = .42$ ) and obese adolescents ( $M= 2.13$ ,  $SD = .52$ ). Global Self-Worth- Healthy adolescents had high mean on the domain of global self-worth ( $M= 2.70$ ,  $SD = .41$ ) as compared to overweight adolescents ( $M= 2.58$ ,  $SD = .51$ ) and obese adolescents ( $M= 2.25$ ,  $SD = .78$ ).

B. The domains which did not show difference on mean values are-

Social Competence- Healthy and overweight adolescents have similar means on the domain of social competence ( $M= 2.64$ ,  $SD = .42$ ) and ( $M= 2.60$ ,  $SD = .42$ ) respectively. Obese adolescents have comparatively lower social competence ( $M= 2.19$ ,  $SD = .61$ ). Athletic Competence- Healthy and overweight adolescents have similar means on the domain of athletic competence ( $M= 2.51$ ,  $SD = .38$ ) and ( $M= 2.51$ ,  $SD = .41$ ) respectively. Whereas obese adolescents have comparatively low athletic competence ( $M= 2.25$ ,  $SD = .57$ ). Physical Appearance- Healthy and overweight adolescents have similar means on the domain of physical appearance ( $M= 2.46$ ,  $SD = .40$ ) and ( $M= 2.47$ ,  $SD = .49$ ) respectively. Obese adolescents have low mean on the domain of physical appearance ( $M= 2.15$ ,  $SD = .69$ ). Romantic Appeal- Healthy and overweight adolescents have similar means on the domain of romantic appeal ( $M= 2.53$ ,  $SD = .43$ ) and ( $M= 2.51$ ,  $SD = .46$ ) respectively. While obese adolescents have low mean on the domain of romantic appeal ( $M= 2.06$ ,  $SD = .53$ ). Behavioral Conduct- Healthy and overweight adolescents have similar means on the domain of behavioral conduct ( $M= 2.62$ ,  $SD = .36$ ) and ( $M= 2.63$ ,  $SD = .43$ ) respectively. Obese adolescents have low mean on the domain of behavioral conduct ( $M= 2.28$ ,  $SD = .48$ ).

**Table 3;** Means, Standard Deviation, One-way ANOVA across groups of body mass index on self-perception and its domains.

	Healthy	Overweight	Obese	F (2,347)	$\eta^2$
Variables	<i>M(SD)</i>	<i>M(SD)</i>	<i>M(SD)</i>		
Scholastic Competence	2.64 (.41) <sub>a</sub>	2.47 (.44) <sub>b</sub>	2.28 (.55) <sub>c</sub>	16.615**	.08
Social Competence	2.64 (.42) <sub>a</sub>	2.60 (.42) <sub>a</sub>	2.19 (.61) <sub>b</sub>	24.073	.12
Athletic Competence	2.51 (.38) <sub>a</sub>	2.51 (.41) <sub>a</sub>	2.25 (.57) <sub>b</sub>	10.355**	.05
Physical Appearance	2.46 (.40) <sub>a</sub>	2.47 (.49) <sub>a</sub>	2.15 (.69) <sub>b</sub>	11.356**	.06
Job Competence	2.60 (.37) <sub>a</sub>	2.58 (.39) <sub>a</sub>	2.40 (.50) <sub>b</sub>	6.090	.03
Romantic Appeal	2.53 (.43) <sub>a</sub>	2.51 (.46) <sub>a</sub>	2.06 (.53) <sub>b</sub>	28.061	.13
Behavioral Conduct	2.62 (.36) <sub>a</sub>	2.63 (.43) <sub>a</sub>	2.28 (.48) <sub>b</sub>	18.905**	.09
Close Friendship	2.36 (.42) <sub>a</sub>	2.42 (.37) <sub>a</sub>	2.13 (.52) <sub>b</sub>	10.518**	.05
Global Self-Worth	2.70 (.41) <sub>a</sub>	2.58 (.51) <sub>a</sub>	2.25 (.78) <sub>b</sub>	17.580**	.09

Note. Means with different subscripts differ significantly from each other. \* $p<.001$ .

As shown in Table 3, as per one-way anova, on the following 6 domains, the adolescents of 3 groups tend to differ. These are-

**Scholastic Competence**,  $F(2,347)=16.615, p<.001$ . The strength of the relationship, as indexed by  $\eta^2$ , was .08, which was less than Cohen's (1998) convention for small effect size ( $\eta^2=.20$ ). The mean scores revealed that healthy adolescents had higher scholastic competence as compared to overweight and obese adolescents ( $M=2.64, SD=.41$ ), ( $M=2.47, SD=.44$ ) and ( $M=2.28, SD=.55$ ) respectively.

**Athletic Competence**,  $F(2,347)=10.355, p<.001$ . The strength of the relationship, as indexed by  $\eta^2$ , was .05, which was less than Cohen's (1998) convention for small effect size ( $\eta^2=.20$ ). The mean scores revealed that healthy and overweight adolescents have similar mean values on the domain of Athletic Competence as compared to obese adolescents ( $M=2.51, SD=.38$ ), ( $M=2.51, SD=.41$ ) and ( $M=2.25, SD=.57$ ) respectively.

**Physical Appearance**,  $F(2,347)=11.356, p<.001$ . The strength of the relationship, as indexed by  $\eta^2$ , was .06, which was less than Cohen's (1998) convention for small effect size ( $\eta^2=.20$ ). The mean scores revealed that healthy and overweight adolescents have similar mean values on the domain of physical appearance as compared to obese adolescents ( $M=2.46, SD=.40$ ), ( $M=2.47, SD=.49$ ) and ( $M=2.15, SD=.69$ ) respectively.

**Behavioral Conduct**,  $F(2,347)=18.905, p<.001$ . The strength of the relationship, as indexed by  $\eta^2$ , was .09, which was less than Cohen's (1998) convention for small effect size ( $\eta^2=.20$ ). The mean scores revealed that healthy and overweight adolescents have similar mean values on the domain of behavioral conduct as compared to obese adolescents ( $M=2.62, SD=.36$ ), ( $M=2.63, SD=.43$ ) and ( $M=2.28, SD=.48$ ) respectively.

**Close Friendship**,  $F(2,347)=10.518, p<.001$ . The strength of the relationship, as indexed by  $\eta^2$ , was .05, which was less than Cohen's (1998) convention for small effect size ( $\eta^2=.20$ ). The mean scores revealed that overweight adolescents have higher mean value on the domain of close friendship as compared to healthy and obese adolescents ( $M=2.42, SD=.37$ ), ( $M=2.36, SD=.42$ ) and ( $M=2.13, SD=.52$ ) respectively.

**Global self-worth**,  $F(2,347)=17.580, p<.001$ . The strength of the relationship, as indexed by  $\eta^2$ , was .09, which was less than Cohen's (1998) convention for small effect size ( $\eta^2=.20$ ). The mean scores revealed that healthy adolescents have higher mean value on the domain of global self-worth as compared to overweight and obese adolescents ( $M=2.70, SD=.41$ ), ( $M=2.58, SD=.51$ ) and ( $M=2.25, SD=.78$ ) respectively.

Post hoc Tukey test further indicated that significant pairwise differences existed between healthy, overweight, and obese adolescents on the domain of scholastic competence. Also, significant pairwise differences existed between healthy and obese adolescents on the domain of social competence, athletic competence, physical appearance, job competence, romantic appeal, behavioral conduct, close friendship, and global self-worth.

Following 3 domains did not show statistically significant difference. These are-

**Social Competence**,  $F(2,347)=24.073, p<.001$ . The strength of the relationship, as indexed by  $\eta^2$ , was .12. The mean scores revealed that healthy and overweight adolescents have similar mean values on the domain of social competence as compared to obese adolescents ( $M=2.64, SD=.42$ ), ( $M=2.60, SD=.42$ ) and ( $M=2.19, SD=.61$ ) respectively.

**Job Competence**,  $F(2,347)=6.090, p<.001$ . The strength of the relationship, as indexed by  $\eta^2$ , was .03. The mean scores revealed that healthy adolescents have higher mean value on the domain of job competence as compared to overweight and obese adolescents ( $M=2.60, SD=.37$ ), ( $M=2.58, SD=.39$ ) and ( $M=2.40, SD=.50$ ) respectively.

**Romantic Appeal**,  $F(2,347)=28.061, p<.001$ . The strength of the relationship, as indexed by  $\eta^2$ , was .13. The mean scores revealed that healthy and overweight adolescents have similar mean values on the domain of romantic appeal as compared to obese adolescents ( $M=2.53, SD=.43$ ), ( $M=2.51, SD=.46$ ) and ( $M=2.06, SD=.53$ ) respectively.

## 5. Discussion

The current study aimed to examine the difference in self-perception among healthy, overweight, and obese adolescents. As evident from the results, it is concluded that healthy and overweight adolescents have a marginal difference in their mean values on the self-perception domains of social competence, athletic competence, physical appearance, romantic appeal, and behavioral conduct.

Despite being overweight, adolescents felt they are healthy and possessed the same characteristics as healthy adolescents. This could be due to their inability to transform into action the need to eat healthier and engage themselves in increased physical activity. Another reason could also be the change in today's world trends, as adolescents do not consider weight as a number. They believe that weight is a state which results in strong negative feelings about themselves that is visible to others. In addition to this, adolescents consider health as a state of mind rather than the body. Possibly they explain this by a theory they have made which states that if they eat healthy, do physical exercise and they did not report any health issues, then they are healthy, even if they don't look physically healthy. Hence, to overweight adolescents and in many cases, even obese adolescents tend to consider themselves healthy (Yerges et al. 2021).

As seen from Table 2 overweight adolescents have high scholastic competence. This indicates that their intellectual behavior and the manifestation of daily-life activities (developed by teachers in their early years of schooling) is high even after being overweight. Healthy adolescents share the same characteristics, as their mean has a marginal difference with the mean of overweight adolescents.

Results indicate that healthy and overweight adolescents have similar means on the domain of social competence which indicate their behavior in the presence of others. They are fun to be with, they like to meet and greet new people and, they are at ease in the presence of others, as compared to obese adolescents who are uncomfortable in the presence of others (Yang, 2014).

Results indicate that healthy and overweight adolescents also have similar means on the domain of athletic competence which indicates that they have abilities related to sports. They have proficiency in sports, they have the willingness to participate in and they make an effort in trying new physical activities. Whereas obese adolescents tend to be lazy and do not prefer engaging in physical activities.

For the domain of physical appearance, healthy and overweight adolescents have similar means which indicates they are happy with their looks, being attractive and satisfied with one's face and hair. While obese adolescents aren't happy with their looks, they don't feel attractive and satisfied with their looks.

Results indicate that healthy adolescents have high job competency than overweight adolescents and least for obese adolescents. This indicates that healthy adolescents are motivated and competent in their major occupation, job, or work. They feel productive and proud of their work. Whereas obese adolescents are not motivated in their occupation.

Results indicate that healthy and overweight adolescents have similar means on the domain of romantic appeal which indicates that they constitute close, meaningful interactions with their significant other or a very special friend. They seek out close, intimate relationships and the feeling of free communication openly in a close relationship. Whereas obese adolescents lack the warmth in their relationships with their significant others and lack the foundation of a close intimate relationship.

Findings also reveal that healthy and overweight adolescents have similar means on the domain of behavioral conduct which implies that they behave in a suitable and polite manner with others. They lead, guide, and control their behavior in front of others. Whereas obese adolescents lack this control and politeness (Pritchard, 1997).

Results reveal that overweight adolescents have the highest mean for the domain of close friendship which implies that they can make their close friends very comfortable talking about everything without the fear of judgement. They care about them, are always there for them and they are considerate of their well-being. Healthy adolescents also possess these characteristics, but they have low mean value than overweight

adolescents. While obese adolescents lack this kind of close friendship and do not make many friends (Kakeshita, 2006).

Lastly, results reveal that healthy adolescents have high global self-worth than overweight and obese adolescents. This implies that they have global perceptions of worth which means they are independent of any domain of competence/ adequacy. They like the way they are leading their life, they are pleased and satisfied with themselves, and they like themselves as a person. In contrast, obese adolescents often have inadequacies in almost all domains which indicates that their physical self relates to their psychological self. Their dissatisfaction with their physical life leads to inadequacies in their psychological, emotional, and social self. When these inadequacies hinder their daily life, then anxieties, depression, eating disorders etc. occur.

For one way analysis of variance, we can conclude that there was a significant difference in self-perception in the domains of scholastic competence, athletic competence, physical appearance, behavioral conduct, close friendship, and global self-worth among the three groups of body mass index. This indicates that with an increase in body mass index results in the development of negative feelings about one's body and appearance. These negative feelings hinder daily life activities at school, in the living environment, and home. Adolescents who are healthy and overweight have an accurate self-perception which helps them to excel in daily life challenges. Their cognitive abilities as well as their way of perceiving situations involving the real self-become comprehensible. When their perception of the ideal and real self becomes distinct, their predisposition to be judged by others decreases to a great extent. This maintains their close relationships with their peers and caregivers. Overall, their contentment with themselves reaches a high level which strengthens over time. When they have fulfillment with their-inner self-perception, their surrounding domains become adequate by restoration. On the contrary when this balance breaks, primarily due to discrepancies between the desired self and real self, imbalances begin in school, work, and home environment. This not only affects the academic and physical performance of an adolescent but also their close relationships with their peers and schoolmates. Therefore, being obese creates a polarity between physical and psychological worlds of an adolescent. Stress, sadness, anxiety, and various other emotions add to the misery of being obese. Lastly, self-perception of an obese adolescent becomes delicate and fragile.

## 6. Conclusion

It has becoming increasing difficult to make adolescents aware of the fact that overweight is still physically unhealthy. This lack of self-awareness has caused many studies to conclude that healthy and overweight adolescents have only marginal differences in their characteristics. Body weight affects the self-perception of the adolescent in many ways. It develops discrepancies between their desired and real self by developing strong negative feelings about themselves. These negative feelings gives rise to various psychological disorders like anxiety, depression, sadness, loneliness.

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