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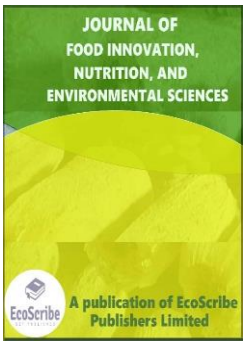

ORIGINAL ARTICLE

Influence of Body Weight and Image Perception on the Nutritional Status of 8-19-Year-Olds Attending Schools in Kampala, Uganda

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ABSTRACT

Inaccurate weight perceptions (body image distortion) and body image dissatisfaction among children and adolescents, may lead to unhealthy weight control practices, greater risk for adult obesity and obesity-related morbidities. This study aimed at assessing weight perception, body image distortion and dissatisfaction, their related factors and how all these influences the nutritional status of children and adolescents attending schools in Kampala district in Uganda. The cross-sectional survey constituted 1043 children and adolescents (aged 8–19 years) attending primary and secondary schools in Kampala district, Uganda. Semi-structured questionnaires were used to collect the data on self-reported weight perception and preference. Overall, 17.74%, 67.98% and 14.28% of participants under-, correctly and over-estimated their weight status. There was only fair agreement between participants' actual and perceived weight status, denoted by an overall kappa coefficient of 0.21. A significant proportion of participants (32.02%) had body image distortion. Highest proportions of dissatisfaction were among: those who belonged to grade 3 thinness based on BMI, perception and preference; 10-14-year-olds attending primary schools and; females. Normal weight status was the most preferred while grade 3 thinness was the least preferred weight status category. More children (14.46%) than adolescents (9.95%), preferred being obese. More females (15.29%) than males (8.06%) preferred being thin. Factors including actual, perceived and preferred weight status, age category, gender and education level were identified to influence weight perception, weight preference and body image distortion and dissatisfaction. These should be considered when designing interventions for prevention and management of childhood and adolescence overweight and obesity.

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1. Introduction

The prevalence of childhood and adolescence overweight and obesity has increased dramatically in recent years, posing serious health risks, due to the known association with adulthood obesity and incidence of non-communicable diseases (Horesh et al. 2021). Childhood and adolescence overweight and obesity can lead to consequences such as type 2 diabetes, hypertension, atherosclerosis, and poor quality of life extending into adulthood (Wacker-Gussmann and Oberhoffer-Fritz 2022). Overweight and obesity are also associated with body image disturbances (Moradi et al. 2021). Body image is characterized by one's mental perception of measures, contours and shapes of the body and parts of it (Pelegrini et al. 2014) and is associated with conditions like body image distortion and dissatisfaction (Moradi et al. 2021).

Body weight perception refers to the personal evaluation of one's weight as "underweight" or "normal weight" or "overweight" irrespective of actual body mass index (BMI). The discrepancy in body weight perception is known as body image distortion (Gualdi-russo et al. 2022). Individuals who incorrectly judge their actual body size express a certain degree of body image dissatisfaction (Markland and Ingledew 2007). Weight control behaviors are precipitated by body weight perception. Adolescents misperceiving themselves as overweight are at increased risk of eating disorders, emotional and behavioral problems, and suicidal thoughts (Zu et al. 2023). Healthy or overweight individuals who perceive themselves as overweight or fat are more likely to engage in weight reduction activities, whereas individuals with an excess body weight who do not perceive themselves as overweight will not engage in weight loss behaviors (Bodde et al. 2014). Theoretical models of health behavior change emphasize the need to perceive oneself at risk as a prerequisite to behavior change (Maximova et al. 2008). Accurately perceiving oneself as overweight or obese is considered an important cue for action and has been linked to greater motivation for healthy eating and physical activity in order to lose weight (Al-Rasheed et al. 2022). Therefore, weight status perception is a factor influencing eating behaviors, physical activity, weight management and mental health in teenagers (Mbogori and Arthur 2019). Body weight perception is influenced by a number of factors including gender, family, peers, media, ethnicity and age. Eight-year old children were reported to be preoccupied with their body size, and this preoccupation intensified and peaked during adolescence (Bhurtun and Jeewon 2013).

Body image distortion is defined as the degree to which an individual has a distorted perception regarding his or her objective appearance or misinterpretation of one's body size (Mohamed and Idrees 2023). An undistorted body image may be defined as holding perceptual and/or attitudinal beliefs which are consistent with objective data while distorted body image represents divergence between subjective and objective data (Blashill and Wilhelm 2014). Although both males and females report body image distortions, there may be differing patterns between the genders (McCreary and Sadava 2001). In the Western culture, females tend to internalize a thin appearance as ideal (Thompson and Stice 2001), whereas males emphasize a mesomorphic (muscular) body (Olivardia et al. 2004). On the other hand, in African culture, increased body mass and overweight children were regarded as reflecting health as it was associated with sufficient food supply and intake (Mvo, Dick, and Steyn 1999). Body image distortion in adolescents may play a crucial role in the development of risky behaviors such as excessive dieting, exercising and purging. This distortion can lead to serious psychological and medical problems such as eating disorders (e.g. anorexia nervosa and bulimia nervosa) (Singh and Nandy 2024). Body image distortion is recognized to be a core and often persistent symptom in eating disorders defined as disorders in which there is extreme concern with the control of body weight and shape, followed by grossly inadequate, capricious, or hectic food intake (Prnjak et al. 2021). Body image dissatisfaction is the negative subjective evaluation of one's physical body, such as figure, stomach, hips, and weight or unhappiness with specific parts, or the totality, of one's shape (Grogan 2021). Biological, physical, psychological and social changes, and body image disturbance, especially due to dissatisfaction with one's own body, are frequently observed during adolescence (Pelegrini et al. 2014). Biological factors, including age, sex, and body composition, along with psychological factors, including depression, low self-esteem, and adoption of weight-loss strategies, are conditions of influence for body image dissatisfaction during childhood and adolescence (Santana et al. 2013). Pre-occupation with their body size was found among 8-year old children and this preoccupation intensified and peaked during adolescence (Bhurtun and Jeewon 2013). Overweight and obesity are associated with body-image dissatisfaction and low self-esteem (Escrivá et al. 2021). In most cases, media and society impose a "thin-ideal" for female beauty and an athletic image for males (Pelegrini et al. 2014); (van den Berg et al. 2007). Body image dissatisfaction is a serious risk factor for eating disorders and compulsive eating, the adoption of improper eating attitudes and behaviors and, obesity (İNCE PALAMUTOĞLU and İNCE YENİLMEZ 2021). To avoid such consequences, developing effective interventions for overweight and obese children and adolescents is a major public health priority (Dietz 2006).

Despite their importance, there's a paucity of published data on body weight perception, body image distortion and dissatisfaction, their associated factors, and how these influence the nutritional status or dietary practices of children and adolescents in Uganda. Given the implications of body weight perception, body image distortion and dissatisfaction on weight control behaviors and mental health, the status needs to be established. The aim of the present study was to assess children and adolescents' weight status perception, body image distortion

and dissatisfaction, their influencing factors, and how these can relate to the nutritional status of these age groups.

2. Methodologies

2.1 Participants

Participants for this study were 8-19-year-old children and adolescents attending primary and secondary schools in the five divisions (Nakawa, Makindye, Kawempe, Rubaga, and Central) of Kampala district, in Uganda. In order to recruit a representative sample from Kampala district, participants were selected by multiple-stage sampling in the order of division, school, and class. Eleven representative schools were subsequently selected to represent schools in Kampala district. At least one primary and one secondary school were selected from each division.

Study procedures were approved by Makerere University School of Biomedical Sciences Higher Degrees, Research and Ethics Committee and Uganda National Council for Science and Technology with approval numbers: SBS 291 and HS 1950 respectively.

2.2 Assessment of actual weight status, weight perception, weight status preference, body image distortion and dissatisfaction

Participants' actual weight status was assessed using BMI. Height and weight were taken by trained researchers using standard equipment. Body weight was measured to the nearest 0.1 kg using a weighing scale, (Seca 899; Seca Weighing and Measuring Systems, Model No. 8691321004, SECA Gmbh & Co. Germany made in China) with minimal clothing and no shoes. Height was measured to the nearest 0.1 cm using a height board (Shorr-board, height board, Weight and Measure LLC, Irwin J. Shorr, MPH, MPS. Olney, Maryland USA) without shoes. BMI was calculated as weight in kilogram divided by the square of height in meters (kg/m^2). Using these measurements and the WHO growth reference for 5-19 years, the status of each subject, based on their actual weight status was categorized into grade 3, 2 and 1-thinness, normal weight, overweight and obesity (de Onis 2007). Weight perception was assessed according to the method used by Gualdi-Russo and others (Gualdi-Russo et al. 2012) by asking the question: "Which of these pictures do you think you look like?". Weight status preference was assessed by presenting different sizes and shapes of body silhouettes and asking the question: "Which of these pictures would you like to look like?" Response categories included grade 3 thinness (1), grade 2 thinness (2) and grade 1 thinness (3), normal weight (4), overweight (5) and obesity (6) as illustrated in the figure 1 below. Body image distortion was determined as the discrepancy between actual weight status determined by BMI and the perceived weight status. Responses were categorized as under, correct and over estimation. Body image dissatisfaction was assessed as the disagreement between the participant's perceived weight status and what the participant preferred to look like by asking the questions: "Which of these pictures do you think you look like?" and "Which of these pictures would you like to look like?" On the basis of this analysis, participants were classified as satisfied or dissatisfied.

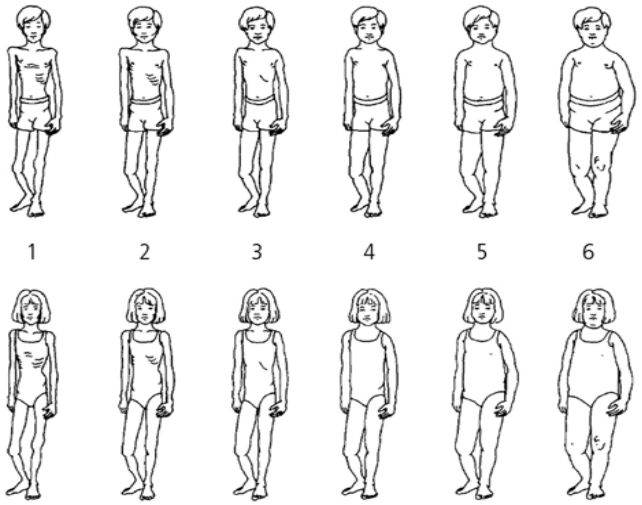

Fig.1: Weight perception for boys and girls

2.3 Data analysis

Subject characteristics were presented as means and standard deviations. Frequencies were used to show proportions of participants in the different BMI, weight perception and preferred weight status categories, and to show proportions of participants with body image satisfaction and dissatisfaction. Kappa coefficient was used to measure agreement between actual and perceived weight status. Kappa values were interpreted as follows: values ≤ 0 as indicated no agreement and 0.01-0.20 as no to slight, 0.21-0.40 as fair, 0.41-0.60 as moderate, 0.61-0.80 as substantial, and 0.81-1.00 as almost perfect agreement (McHugh 2012). Chi square test was applied to show significance of associations of the types of misperceptions, preferred weight status categories and body image satisfaction with independent variables like actual, perceived and preferred weight status, age, gender and level of education. The analyses were done using STATA version 12 software and the level of significance was set at $P < 0.05$.

3. Results and Discussion

3.1 Participants' demographic and actual weight status characteristics.

Of the 1043 participants, 56% were female, 58% attended secondary schools while the rest attended primary schools (Table 1). Participants had mean (standard deviations): age of 14.15 (2.79) years, weight of 47.7 (12.17) kg, height of 154.39 (12.91) cm, BMI of 19.84 (5.79) kg/m^2, waist circumference of 68.02

(6.88) cm and waist: height ratio of 0.442 (0.051). Based on BMI, majority of participants (80.35%) had normal weight status, 9.3% were overweight, 1.58% were obese while 8.53% were thin.

Table 1: Participants' demographic and actual weight status characteristics

	Mean (Standard Deviation)		
Characteristics	**Male**	**Female**	**Total**
N	451	592	1043
Primary school participants (n)	197	243	440
Secondary school participants (n)	254	349	603
Age (years)	14.43 (2.89)	13.94 (2.70)	14.15 (2.79)
Weight (kg)	47.60 (12.58)	47.78 (11.85)	47.70 (12.17)
Height (cm)	156.77 (15.36)	152.58 (10.32)	154.39 (12.91)
BMI (kg/m^2)	19.35 (7.87)	20.21 (3.40)	19.84 (5.79)
Waist circumference (cm)	67.90 (6.96)	68.11 (6.81)	68.02 (6.88)
Waist height ratio	0.436 (0.064)	0.445 (0.037)	0.442 (0.051)
Actual weight status			
BMI categorization	**Frequency (Percentage)**		
Grade 3 thinness	2 (0.44)	1 (0.17)	3 (0.29)
Grade 2 thinness	7 (1.55)	4 (0.68)	11 (1.05)
Grade 1 thinness	42 (9.31)	33 (5.57)	75 (7.19)
Normal weight	375 (83.15)	463 (78.21)	838 (80.35)
Overweight	13 (2.88)	83 (14.02)	96 (9.30)
Obesity	9 (2.00)	7 (1.18)	16 (1.53)
Missing values	3 (0.67)	1 (0.17)	4 (0.38)

3.2 Weight perception and body image distortion

The purpose of the study was to investigate weight perception, weight preference, body image distortion and dissatisfaction and their associated factors in a sample of children and adolescents aged 8–19 years attending primary and secondary schools in Kampala district, Uganda. Publications of similar studies conducted in Africa, were from South Africa (Potgieter and Khan 2005), Mauritius (Bhurtun and Jeewon 2013) and Seychelles (Wilson et al. 2013). While a big proportion of participants (80.35%) were of normal weight status, fewer (72.36%) perceived their status as so (Figure 2). Higher proportions (17.4%) of participants perceived themselves belonging to grade 1, 2, 3 thinness and obese than those that actually belonged in these categories (10.06%). Generally, participants portrayed a certain level of weight misperception. Overall, 68.0% of the participants correctly perceived their weight. There was only fair agreement between participants' actual and perceived weight status with a kappa value of 0.21 (Table 3) thus a significant proportion of participants had body image distortion. While males had no to slight agreement between their perceived and actual weight status, female had fair agreement. Participants regardless of actual weight status exhibited very high body image distortion based on the kappa values that implied no agreement among thin and normal participants and no to slight agreement for overweight and obese participants. Majority of overweight (52.08%) and obese (81.25%) participants underestimated their weight status (Table 2). All participants in the grade 2 and 3 thinness categories overestimated their weight status. Weight status misperception (under and over estimation) was more common among 8–9-year-olds (45.79%) than among 10–14-year-olds (30.15%) and 15–19-year-olds (31.43%). Underestimation of weight status was reported by more female participants (21.62%) than male participants (12.64%). More participants attending secondary schools (20.56%) than those attending primary schools (13.86%) underestimated their weight status. Overestimation of weight status was reported by more male participants (15.30%) than female participants (13.51%). More participants attending primary schools (17.95%) than those attending secondary schools (11.61%) overestimated their weight status. All participants that belonged to grade 1 and 2 of thinness weight categories overestimated their weight status. There were statistically significant associations between weight status perception and actual weight status, age category, gender and level of education of participants. There were also statistically significant differences in levels of accuracy at accessing weight status among the various weight status categories, gender, age categories and education levels at P values < 0.05.

A number of studies demonstrated that body weight perception tends to be inaccurate when compared to BMI (Bhurtun and Jeewon 2013; Brener et al. 2004; Mendonça et al. 2014; Yost et

al. 2010). A similar trend was found among Mauritian teenagers, where 42% of the participants inaccurately perceived their weight (Bhurtun and Jeewon 2013).

The high prevalence of weight status misperception reported among the various age, education, gender and nutrition status categories presents a risk for unhealthy weight control practices and tendency towards eating disorders. The association between body weight misperception and eating disorders, or unhealthy weight control behaviors, including fasting, vomiting on purpose after eating, taking diet pills, and use of laxatives have been reported (Gonsalves, Hawk, and Goodenow 2014). The highest cases of underestimation of body weight were among the overweight (52.08%) and obese (81.25%). Another study among adolescents, found that close to half of those that were overweight assessed themselves as about the right weight and 60.3% of the obese perceived themselves as only slightly overweight (Datar and Chung 2016). Individuals who underestimate their weight status may not engage in any form of weight control behaviors and thus risk overweight and obesity. Overweight and obese individuals perceiving themselves as having normal body mass or even underweight are less likely to engage in weight control practices and are vulnerable to obesity-related disorders (Adjimi 2021). This study also revealed that thin participants exhibited high levels of weight status overestimation. These are more likely to engage in unhealthy weight control practices aimed at losing weight which, together with eating disorders, are especially common, among individuals overestimating their weight status (Manneville et al. 2024). This study's results revealed that weight underestimation was more prevalent in females than males while weight over estimation was more prevalent in males than females. The socio-cultural pressure to adhere to a thin ideal body size and to engage in weight-loss behaviors reported for females and the pressure to have a more muscular figure reported for males (Apopei, Coe, and Cordoba 2024) could probably explain these trends. The prevalence of body image distortion could be attributed to factors such as: appearance-based pressure from family, peers, and media; teasing; and comparisons and could also result into eating disorders. Socio-cultural effects (i.e. appearance based pressure from family, peers, and media; teasing; and comparisons) were reported to possibly be salient influences on a range of body image distortion among Chinese male adolescents (Jackson and Hong Chen 2008). In addition, eating disorders like anorexia, bulimia nervosa, outside eating, binge eating, single eating were reported to be positively correlated with body image distortion among adolescent boys and girls in Lucknow city, India (Anamika 2014).

3.3 Body image dissatisfaction

Overall, majority of the participants (53.65%) were dissatisfied with their self-perceived body weight (Table 4). Higher proportions (18.09%) of participants preferred to belong to grade 1, 2, 3 thinness and obese weight status categories than the proportion that were actually of grade 1, 2, 3 thinness and obese weight status categories (10.06%). Generally, participants portrayed a certain level of body image dissatisfaction (Figure 2). There were statistically significant associations between body image satisfaction and preferred weight status, perceived weight status, age category, gender and level of education of participants. Based on actual weight status by BMI, highest dissatisfaction was found among participants who had grade 3 and 1 thinness and those who were overweight. Highest proportions of dissatisfied participants were those who perceived themselves as overweight (76.42%), obese (72.41%), grade 2- and grade 3-thinness at 75.00% and 76.47% respectively. Similar trends were found in weight status preference where highest proportions of dissatisfied participants were those who preferred to be in overweight (75.00%) obese (86.21%), grade 2 (70.83%) and grade 3 (71.43%) thinness categories. More adolescents than children desired to be of normal weight. More 10–14-year-olds than 8–9-year-olds and 15–19-year-olds, more female than male, more primary school than secondary school participants were dissatisfied with their self-perceived body images.

The rate of body image dissatisfaction was high (53.65%) and comparable to that reported elsewhere (56.7%) (Pelegrini et al. 2014) and (60.4%) (Petroski, Pelegrini, and Glaner 2012). This high rate of body image dissatisfaction could be attributed to a number of factors including: family, friends, media, society, but probably more to media and society as they impose a "thin-ideal" for female beauty and an athletic image for males (Apopei et al. 2024). These rates of dissatisfaction suggest that body dissatisfaction should be regarded as an important public-health problem and should be included in the list of childhood and adolescent health concerns, since this attitude can cause eating disorders like bulimia, anorexia, low self-esteem, and health-related risk attitudes and behaviors such as acceptance of poorly planned diets, exercise dependence and consumption of weight-loss drugs (Hrabosky and Grilo 2007). In addition, this condition may have important negative repercussions on adult life and result in immeasurable expenses for health services. The present findings demonstrated a higher prevalence of body image dissatisfaction among adolescent girls, in agreement with those reported by others authors (Pelegrini et al. 2014). Females are generally more concerned about their body image, presenting greater dissatisfaction and weight gain concerns and preferring thin beauty ideals (Polivy, Garner, and Garfinkel 2022). In light of the high prevalence of body image dissatisfaction existing among the children and adolescents in Uganda and the fact that body image dissatisfaction motivates weight control behaviors, promotion of healthy eating by schools and health organizations is important. Since media holds an important place in influencing body image dissatisfaction, media can also be used to publicize healthful messages.

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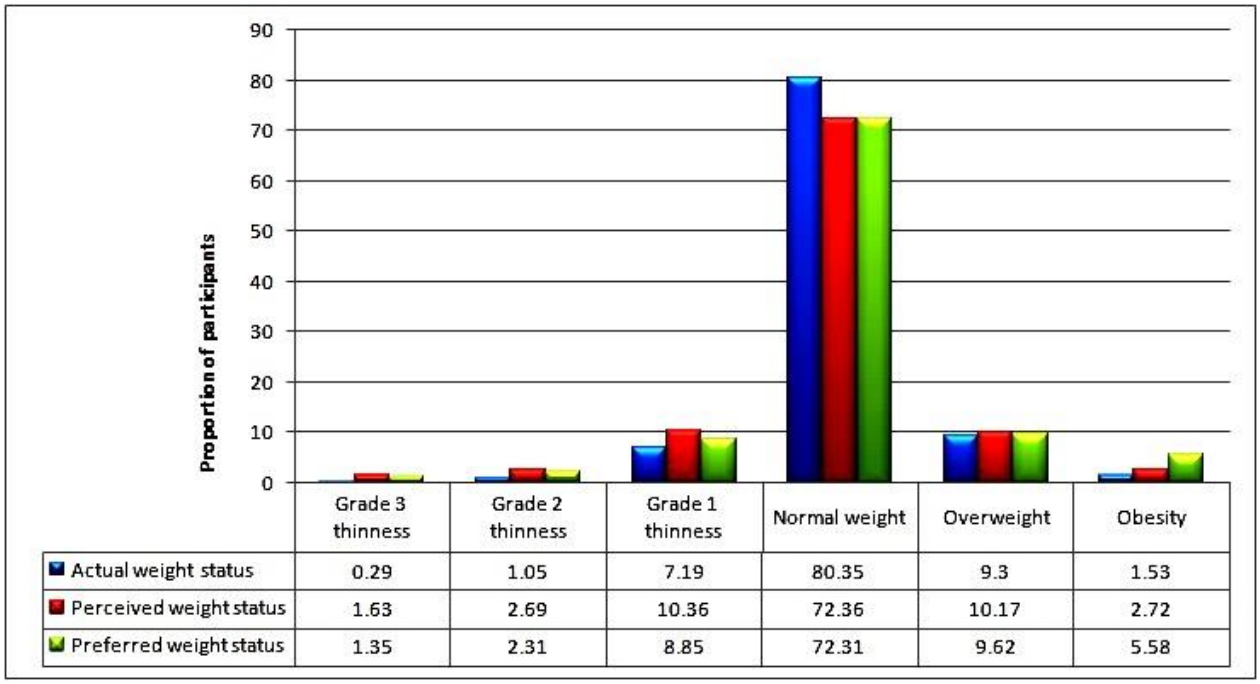

Fig.2: Actual, self-perceived and preferred weight status of participants

Table 2: Self-perceived weight status and significance of association with selected factors among children and adolescents attending primary and secondary schools in Kampala district in Uganda

Factors		Self-perceived weight status			
		Under estimation (%)	**Correct estimation (%)**	**Over estimation (%)**	**Chi square p value**
BMI categorization	Grade 3 thinness	0.00	0.00	100.00	P = 0.000
	Grade 2 thinness	0.00	0.00	100.00	
	Grade 1 thinness	9.33	30.67	60.00	
	Normal weight	13.25	77.21	9.55	
	Overweight	52.08	37.50	10.42	
	Obesity	81.25	18.75	0.00	
Age category	8-9 years	26.51	54.22	19.28	P = 0.010
	10-14 years	14.41	69.84	15.74	
	15-19 years	19.25	68.57	12.18	
Gender	Male	12.64	72.06	15.30	P = 0.001
	Female	21.62	64.86	13.51	
Level of education	Primary school	13.86	68.18	17.95	P = 0.001
	Secondary school	20.56	67.83	11.61	
Total		**17.74**	**67.98**	**14.28**	

Table 3: Agreement between perceived and actual (measured) weight status of studied children and adolescents attending primary and secondary schools in Kampala district in Uganda

Factor		Agreement (%)	Kappa	Std. Error	Z	P>Z
Gender	Male	72.54	0.0886	0.0316	2.8000	0.025
	Female	65.08	0.2514	0.0260	9.67	0.000
Education level	Primary	68.18	0.1756	0.0303	5.80	0.000
	Secondary	68.39	0.2281	0.0263	8.69	0.000
Age group	8-9 years	54.22	0.0280	0.0601	0.47	0.320
	10-14 years	70.00	0.2268	0.0317	7.16	0.000
	15-19 years	69.11	0.2219	0.0287	7.74	0.000
BMI category	Underweight	25.84	-0.0332	0.0295	-1.13	0.870
	Normal	77.21	0.0000	0.0000	0.00	0.500
	Overweight/obese	35.14	0.0294	0.0319	0.92	0.179
Overall		**68.30**	**0.2057**	**0.201**	**10.25**	**0.000**

Table 4: Body image satisfaction level and significance of association with selected factors among children and adolescents in Uganda

Factors		Body image satisfaction level		
		Satisfied (%)	Dissatisfied (%)	Chi square P value
BMI categorization	Grade 3 thinness	33.33	66.67	P = 0.005
	Grade 2 thinness	54.55	45.45	
	Grade 1 thinness	32.00	68.00	
	Normal weight	49.05	50.95	
	Overweight	32.29	67.71	
	Obesity	50.00	50.00	
Perceived weight status	Grade 3 thinness	23.53	76.47	P = 0.000
	Grade 2 thinness	25.00	75.00	
	Grade 1 thinness	37.96	62.04	
	Normal weight	52.79	47.21	
	Overweight	23.58	76.42	
	Obesity	27.59	72.41	
Preferred weight status	Grade 3 thinness	28.57	71.43	P = 0.000
	Grade 2 thinness	29.17	70.83	
	Grade 1 thinness	44.56	55.43	
	Normal weight	52.93	47.07	
	Overweight	25.00	75.00	
	Obesity	13.79	86.21	
Age category	8-9 years	40.96	59.04	P = 0.000
	10-14 years	39.69	60.31	
	15-19 years	53.24	46.76	
Gender	Male	52.77	47.23	P = 0.000
	Female	41.55	58.48	
Level of education	Primary school	38.41	61.59	P = 0.000
	Secondary school	52.24	47.76	
TOTAL		**46.35**	**53.65**	

3.4 Weight status

Higher proportions (18.09%) of participants preferred belonging to grade 1, 2, 3 thinness and obese than the number that belonged to these categories (10.06%). Generally, participants portrayed a considerable level of body image dissatisfaction. In descending order, the preferred weight categories were as follows: normal, overweight, grade 1 thinness, obese, grade 2 thinness and grade 3 thinness (Figure 2). Grade 1, 2, 3 thinness and normal weight categories were most preferred by participants who perceived themselves as belonging to those same categories. There were statistically significant associations between preferred weight status and perceived weight status, age category, gender and level of education of participants (Table 5). On the other hand, there was no statistically significant association between preferred and actual weight status of participants. Participants who perceived themselves as overweight and obese desired to be thinner. More adolescents than children desired to be normal weight. More 8–9-year-olds than 10–19-year-olds and 15–19-year-olds desired to be overweight and obese. More females (15.29%) than males (8.06%) desired thinness. Likewise, more secondary school participants (14.46%) desired to be thinner than primary school participants (9.83%). More primary school participants (23.06%) desired to be bigger than secondary school participants (9.47%). While body image distortion and dissatisfaction were prevalent among the study population, there was a high preference for normal weight status compared to other weight categories regardless of gender, age category, education level, actual and perceived weight status, which is beneficial. This preference can be attributed to participants' knowledge on the consequences of childhood and adolescent overweight and obesity and the benefits of normal weight, likely obtained from science classes at school. These consequences could include: cardiovascular diseases (mainly heart disease and stroke); diabetes; musculoskeletal disorders, especially osteoarthritis; and certain types of cancer (endometrial, breast and colon) (Held, Sestan, and Jelusic 2023). On the other hand, healthy weight is associated with health benefits, such as improvements in blood pressure, cholesterol and sugars and decreases risk factors for chronic diseases related to obesity (CDC 2015). The desire for thinness that was more prevalent among females than males and among secondary than primary school participants, is likely to trigger unhealthy weight control behaviors such as skipping meals, fasting, vomiting, and taking laxatives, which have been reported as prevalent among individuals who desire to lose weight (Bruzas and Allison 2023). The desire for overweight and obesity that was more prevalent among young children than older children and adolescents and among primary than secondary school participants could be attributed to the African culture where increased body mass and overweight in children is regarded as reflecting health being associated with sufficient food supply and intake (Mvo et al. 1999).

While weight misperception; body image distortion and dissatisfaction were prevalent among the study population, the authors acknowledge the following limitations:

- There is a possibility that the participants who perceived themselves as overweight or obese and already involved in weight loss regimes or dietary practices at the time of data collection.
- There is a possibility that the participants who perceived themselves as underweight or thin and already embarked on weight gain dietary practices at the time of data collection.

Conclusion

The study shows that weight misperception; body image distortion and dissatisfaction are common problems among children and adolescents in Uganda and that these are associated with various factors such as gender, age category, BMI, level of education, perceived and preferred weight status. Taking the identified risk factors into consideration could improve accuracy in identifying and intervening with children and adolescents at the greatest risk of long-term weight problems, weight-related morbidity, and unhealthy weight control practices. Increased awareness among parents, educators, and public health officials and a comprehensive approach considering all of this are needed.

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Conflict of interest

The authors declare no conflict of interest.

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Table 5: Preferred weight status and significance of association with selected factors among children and adolescents in Uganda

Factors		Preferred of Weight Status						
		thinness	Grade 2 thinness	Grade 1 thinness	Normal weight	Overweight	Obese	Chi square P value
Actual BMI categorization	Grade 3 thinness	0.00	0.00	0.00	100.00	0.00	0.00	P = 0.834
	Grade 2 thinness	0.00	0.00	18.18	72.73	9.09	0.00	
	Grade 1 thinness	4.00	0.00	13.33	66.67	10.67	5.33	
	Normal weight	1.08	2.63	8.49	72.61	9.45	5.74	
	Overweight	1.05	2.11	9.47	72.63	9.47	5.26	
	Obese	6.25	0.00	0.00	68.75	18.45	6.25	
Perceived weight status	Grade 3 thinness	23.53	23.53	5.88	29.41	5.88	11.76	P = 0.000
	Grade 2 thinness	3.57	25.00	17.86	50.00	0.00	3.57	
	Grade 1 thinness	2.78	4.63	37.96	46.30	4.63	3.70	
	Normal weight	0.53	0.80	5.19	81.52	8.64	3.32	
	Overweight	0.94	0.94	4.72	53.77	23.58	16.04	
	Obese	3.45	3.45	3.45	44.83	13.99	31.03	
Age category	8-9 years	1.20	3.61	15.66	51.81	13.25	14.46	P = 0.000
	10-14 years	0.67	1.12	6.92	73.44	10.27	7.59	
	15-19 years	1.96	3.14	9.43	74.66	8.45	2.36	
Gender	Male	1.11	0.08	6.87	76.50	9.31	5.32	P = 0.024
	Female	1.53	3.40	10.36	69.10	9.85	5.74	
Level of education	Primary school	0.68	1.83	7.31	67.12	12.56	10.50	P = 0.000
	Secondary school	1.83	2.66	9.97	76.08	7.48	1.99	
Total		**1.35**	**2.31**	**8.85**	**72.31**	**9.62**	**5.58**	

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