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Lifestyle, body mass index and wellness in youth: Strengthens and weakness in Italian youth

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Abstract

This study investigated the psychological wellbeing and body perception among young Italian people. Drinking, eating, and sexual behaviors have been examined in relation to body mass index (BMI) and psychological well-being by EPOCH framework. This was a cross-sectional observational study conducted on Italian adolescent and young adult population through an online survey. Qualitative and quantitative data on lifestyle, BMI classes, and psychological characteristics of wellness in youth were obtained from a sample of 1221 Italian participants using a self-report questionnaire on body perception and habits, a socio-demographics inventory, and the EPOCH measure. Findings suggest that being underweight or overweight is associated with various factors, including gender, self-control regarding food, perception of one's body, and the happiness domain. EPOCH framework revealed the psychological wellness of girls and young women did not seem strongly affected by BMI, though Perseverance and Happiness seemed reduced with increasing BMI. The Engagement, Optimism, and Connectedness domains were not significantly affected by the BMI variable. On the contrary, Perseverance and Happiness seemed reduced with increasing BMI and were related to physical shape. Our study offers a new perspective: promoting the development of positive psychological characteristics since adolescence to boost quality of life by improving wellness, by EPOCH approach could be functional reinforcing specific psychological aspects in young generations regarding future wellness, improving the positive perception and management of their own health.

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Introduction

Youth is a crucial growth period for multiple complex domains, including the development of identity. This process of growth affects various features, including physical, mental, social, and sexual factors. Eating, drinking, as well as sexual behaviors influence the (positive or negative) modeling of healthy behaviors and simultaneously affect youth's psychological well-being (Di Giacomo *et al*., 2018). Self-acceptance is a relevant psychological condition for youth, as well as appearance, weight, and comparison to others (Meland *et al*., 2007; Grabe *et al*., 2008; Voelker *et al*., 2015; Goldsmith & Byers, 2016; Senin-Calderon *et al*., 2017; Elsborg & Elbe, 2018).

Body self-perception in terms of satisfaction has been reported to be the main predictor of wellness in youth (Becker *et al*., 2017). Satisfaction with, and concerns about, body weight are affected by social norms and cultural standards (Szabo & Allwood, 2006). Weight and shape are two substantial concerns for young people that dramatically rise throughout their development, as they live through a continual process of change. Male and female behaviors are influenced by their low self-acceptance, self-esteem, and/or body image acceptance, which can be predictive factors for negative impact on body satisfaction and self-awareness (Lerner & L. Steinberg, 2009; Lerner *et al*., 2009; Peternel & Sujoldzic, 2009; Scorzetti *et al*., 2013; Caruso *et al*., 2018; Baucom *et al*., 2018). Jalali-Farahani *et al*. (2019) evidenced the body weight factors can influence negatively the self- perception of quality of life among girls; Authors highlighted as the investigated psychosocial factors as emotional, social and school functioning have resulted affected; their finding showed the body dissatisfaction like a risk factor for low mood or reduced self-esteem in youth compromising the wellness of younghood. In fact, Mood *et al* (2011) have suggested that body dissatisfaction mediates the impact of obesity on low self-esteem and high depressive mood. Given the role of body dissatisfaction in the mental well-being of adolescents, body dissatisfaction may be responsible for the impaired quality of life in adolescents who are overweight and obese.

The systematic review of Gerlach *et al*. (2015) provided evi-

dence suggesting that the personality traits of neuroticism and extraversion are risk factors, whereas conscientiousness is a protective factor of higher BMI. Paans *et al*. (2016) investigated the association between personality traits, cognitive reactivity, and BMI; they reported that no personality trait was associated with higher BMI, whereas they found an association between cognitive reactivity and BMI: the relationship between extraversion and overweight/obesity (in terms of lower cognitive reactivity and higher BMI) suggests that cognitive reactivity is a protective factor that helps deal with the detrimental effects of higher weight, showing a resilient cognitive profile. These results depend on the samples studied: the studies were conducted on a population with a wide age range (18-65 years), and the results were compared with healthy and clinical samples (patients with binge eating disorders, depression, obesity, etc.). Several studies have focused on factors that have a negative impact on quality of life and wellness.

An innovative approach to examine youth issues has emerged recently. This approach is the EPOCH Model (Kern *et al*., 2016), which is oriented on positive psychological functioning in youth. The EPOCH model focuses on positive psychological perspective and good functioning of youth rather than on the absence of mental illness; the main domain of this approach is the benefits obtained from the development of personal strengths that build subjective psychological well-being.

To our knowledge, the relationship between positive psychological characteristics and BMI in different categories (at least underweight, normal, and overweight) in youth still needs further comprehensive investigation and the application of the EPOCH Model.

Based on the results of a previous study (Di Giacomo *et al*., 2018), the present study examined the relationship between lifestyle factors (drinking, eating, and sexual behaviors), BMI, and psychological wellness. For this purpose, this study applied the EPOCH model. The EPOCH measure is a brief multidimensional assessment tool for adolescent well-being, which is measured by examining five psychological variables (Engagement, Perseverance, Optimism, Connectedness, and Happiness), as empirical testing of well-being theory focusing on positive psychological functioning.

This study specifically aims to evaluate the association between BMI, aspects of psychological well-being (EPOCH measure), and lifestyle in Italian youth.

Materials and Methods

Ethics Statement

Informed consent was obtained from each participant, and the study adhered to the Declaration of Helsinki (Declaration of Helsinki History Website, 2015).

Participants

Participants were 1221 Italian youth (age range: 15-22 years; M=18.3, SD=3.0). Among them, 997 were females (81.6%) and 224 were males (18.3%).

Weight and height data were obtained to calculate BMI (weight in kilograms divided by squared height in meters), and we divided the Girls and Young Women groups into seven subgroups of BMI based on the criteria of the World Health Organization (WHO): underweight (BMI 16.00–18.49), normal (BMI 18.50–24.99), overweight (BMI 25.00–29.99) (Italian Ministry of Health, 2014). The inclusion criteria were as follows: a) aged 15–25 years and b) gave informed consent.

Instruments

The measurement was based on the detection of indicators of body self-perception and psychological wellness.

The socio-demographic characteristics of participants, such as age, residential area, and weight and height, were collected using a socio-demographics inventory.

Body Self-Perception and Habits (experimental test). It is an experimental self-report questionnaire carried out *ad hoc* to identify body self-perception and daily habits. This questionnaire was based on four indexes: eating, drinking, and sexual behaviors, and body perception articulated into n. 9 items.

*EPOCH Measure of Adolescent Well-being (*Kern *et al*., 2016). This measure is a self-report questionnaire composed of 20 items on a five-point scale; it assesses five positive psychological characteristics that might foster well-being, physical health, and other positive outcomes in adulthood. These five characteristics are as follows: Engagement, Perseverance, Optimism, Connectedness, and Happiness (EPOCH). Engagement refers to the capacity to become absorbed in and to focus on what one is doing, as well as one's involvement and interest in life activities and tasks. Perseverance refers to the ability to pursue one's goals to completion, even in the face of obstacles. Optimism is characterized by hopefulness and confidence about the future, a tendency to take a favorable view of things, and an explanatory style marked by evaluating negative events as temporary, external, and specific to situations. Connectedness refers to the sense that one has satisfying relationships with others, believing that one is cared for, loved, esteemed, and valued, and providing friendship or support to others. Happiness is conceptualized as steady states of positive mood and feeling content with one's life, rather than momentary emotion.

Procedure

Participants were recruited using snowball sampling, a non-randomized method of sample selection. They were contacted using social media (Facebook).

First, we involved medical doctors in the study, who were enrolled via mail. They were trained in the collection of BMI data, and they then recruited eligible participants. The staff of our department provided a digital and online self-report form. Afterward, the self-report questionnaire was linked to a Facebook post, and participants could access it after providing written informed consent. Girls and boys less than 18 years old were also asked to deliver the informed consent form to their parents, who had to then decide if they would consent to their adolescents participating in the study. Young women and men of 18 years or older were asked to provide informed consent themselves. We conducted a nationwide cross-sectional survey in April-August 2017.

Study design

This was a cross-sectional, observational study of the Italian adolescent and young adult population, who were recruited through the social networking website Facebook.

Statistical analysis

Descriptive statistics, such as mean with standard deviation, and frequencies with percentages, were used to examine the characteristics of the sample.

BMI was used to classify participants in the following weight

categories, using the current WHO BMI cut-off (Italian Ministry of Health, 2014): Underweight (<18.50), Normal (18.50-24.99), and Overweight (≥25.00), labeled as 1, 2, and 3. The differences between these three categories were assessed with the χ^2 test for categorical variables and a one-way ANOVA test for quantitative variables. When the resulting differences were statistically significant, the χ^2 test or Bonferroni's test was used for pairwise comparisons in the post hoc analysis. The differences in the mean score of each investigated domain were analyzed between BMI categories and age classes, using a one-way ANOVA test. Bonferroni's test was used for pairwise comparisons in the post hoc analysis.

We used multinomial logistic regression to determine the association between participants' BMI and their demographic, behavioral, and psychological characteristics, and presented relative risk ratios (RRRs) with 95% confidence intervals (95% CIs). We used BMI=2 as the reference category, so in the study, underweight and overweight were compared based on normal weight.

A p-value of <0.05 was the criterion for statistical significance. The data were processed using the STATA/IC 12.0 statistical package.

Results

A total of 1221 Italian youth were enrolled in this study. As shown in Table 1, the mean age of the sample was 18.63±3.09 years. A total of 593 (48.57%) were aged less than 18 years and 628 (51.43%) were 18 years or over. Further, 997 (81.65%) were female. The mean BMI of the sample was 22.63±4.57, and the weight category that was most represented was normal weight (770/1221, 63.06%). Most subjects were high school students (810/1221, 66.34%).

As reported in Tables 2 and 3, 546 (44.72%) of the total respondents said that they have normal self-control regarding food, and 410 (33.58%) said that eating makes them feel normal.

Further, 402 (32.92%) of the total respondents stated that they try to appreciate their breasts when they dress, and 537 (43.98%) reported that their body perception has a negative impact on their social life. Most subjects (939/1221, 76.90%) said they drink alcohol once a week, and drinking alcohol helped 35.71% (436/1221) of all participants to feel more confident. Furthermore, 508/1221 respondents (41.61%) never had sexual relations, and in most cases (486/1221, 39.80%), body perception had a negative impact on sex life. In addition, 450/1221 respondents (36.86%) reported to consider own body attractive.

Table 1. Sociodemographic characteristics of the sample.

	Total (N=1221)
Age (years), mean±SD	18.63±3.09
Age group, n (%)	
<18 years	593 (48.57)
≥18 years	628 (51.43)
Sex, n (%)	
Male	224 (18.35)
Female	997 (81.65)
BMI, mean±SD	22.63±4.57
BMI, n (%)	
Underweight	152 (12.45)
Normal weight	770 (63.06)
Overweight	299 (24.49)
Occupation, n (%)	
Student (high school)	810 (66.34)
College Student	213 (17.44)
Master Student/worker	131 (10.73)
Unemployed	67 (5.49)

Table 2. Raw score of the body self-perception and habits questionnaire.

	Total (N=1221)
1. My self-control regarding food is: n (%)	
Strong/very strong	163 (13.35)
Normal	546 (44.72)
Weak	368 (30.14)
Very weak	144 (11.79)
2. Eating makes me feel: n (%)	
Very good	181 (14.82)
Good	342 (28.01)
Normal	410 (33.58)
Bad/guilty	288 (23.59)
3. While dressing, I value my body parts: n (%)	
Face	377 (30.88)
Breasts	402 (32.92)
Legs	260 (21.29)
Buttocks	182 (14.91)
4. How I perceive my body affects my social life: n (%)	
Positively	232 (19.00)
No influence	452 (37.02)
Negatively	537 (43.98)
5. I am used to drinking: n (%)	
No more than once per week	939 (76.90)
Almost 2 times per week	223 (18.26)
Almost 4 times per week	59 (4.83)
6. Drinking helps me to: n (%)	
Be a part of the group	264 (21.62)
Feel like others	134 (10.97)
Feel more confident	436 (35.71)
Forget my issues	387 (31.70)
7. My sex frequency is: n (%)	
Never	508 (41.61)
Rarely	149 (12.20)
Sometimes	225 (18.43)
Often	339 (27.76)
8. How I perceive my body affects my sex life: n (%)	
Positively	322 (26.37)
No influence	413 (33.82)
Negatively	486 (39.80)
9. My body is attractive: n (%)	
Almost true	283 (23.18)
True	450 (36.86)
Almost false	292 (23.91)
False	196 (16.05)

Table 3. Raw score of the EPOCH Measure.

	Total (N=1221)
Engagement Domain mean±SD	2.77±0.79
Perseverance Domain mean±SD	3.10±0.91
Optimism Domain mean±SD	2.64±0.94
Connectedness Domain mean±SD	3.47±1.09
Happiness Domain mean±SD	2.91±0.94

The analysis of the EPOCH measure showed that the mean scores for the engagement, perseverance, optimism, connectedness, and happiness domains were 2.77±0.79, 3.10±0.91, 2.64±0.94, 3.47±1.09, and 2.91±0.94, respectively.

As shown in Table 4, the mean age of overweight subjects (19.13±3.39) was significantly different from that of the underweight and normal weight categories (18.22±2.87 and 18.51±2.99, respectively). A statistically significant difference according to gender emerged (p=0.019), with 88.82% (135/152) females among underweight respondents *versus* 77.93% (233/299) for the overweight group.

The analysis of self-control regarding food showed statistically significant differences (p<0.001), with strong self-control in the underweight group (43/152, 28.29%), higher than those in the other BMI categories, and stronger self-control in normal weight subjects (107/770, 13.90%) compared to overweight respondents (13/299, 4.35%). Overweight subjects answered "feeling guilty after eating" more frequently than the underweight group (83/299, 27.76% *vs*. 26/152, 17.11%), whereas underweight respondents said they "feel very good after eating" more than the overweight group (32/152, 21.05% *vs*. 33/299, 11.04%) (p=0.043). Significant differences among groups emerged regarding the parts of the body they value when they dress (p<0.001). Answers to the item "How I perceive my body affects my social life" had a different frequency distribution among the normal weight and underweight groups compared to overweight subjects: positive impact was more than five times higher in the underweight group (44/152, 28.95%) and the normal weight group (171/770, 22.21%) than in overweight respondents (17/299, 5.69%), whereas a negative influence was nearly twice as high among the overweight group (193/299, 64.55%) compared to the normal weight (295/770, 38.31%) and underweight (49/152, 32.24%) categories (p<0.001). Drinking alcohol helped overweight subjects to feel equal to others (42/299, 14.05%) more than normal weight respondents (73/299, 9.48%), but the normal weight group reported drinking alcohol to feel more self-confident (293/770, 38.05) more than the overweight group (85/299, 28.43%) (p=0.009). The influence of body self-perception on sex life differed widely in one group compared to the others: those who were overweight reported a negative influence (166/299, 55.52%) much more than the normal weight (273/770, 35.45%) and underweight (47/152, 30.92%) groups (p<0.001). Significant differences emerged for opinion on body image between the three groups: underweight participants had a better opinion on their body than normal weight and overweight respondents, while overweight participants had the worst opinion on their attractiveness. Regarding psychological domain, significant differences (p=0.018) emerged for perseverance between the normal weight and overweight groups (3.15±0.90 *vs*. 2.98±0.92).

Through a comparison by age group stratified by BMI (Table 5), this difference was confirmed in subjects equal to or more than 18 years of age (p=0.048), and a significant difference for connectedness emerged among the overweight group (p=0.038).

We performed a multinomial logistic regression analysis to explain the relationship between BMI categories and the variables that significantly differed among them (Table 6).

We used normal weight as the baseline category. The expected risk of being underweight was higher for females (RRR 2.28, 95% CI 1.25-4.15, p=0.007), for subjects with strong self-control regarding food (RRR 2.51, 95% CI 1.56-4.04, p<0.001), and for those who wanted to value their legs (RRR 1.74, 95% CI 1.04 – 2.91, p=0.034) and buttocks (RRR 1.75, 95% CI 1.01-3.05, p=0.048) while dressing; on the other hand, it was lower for those with weak self-control regarding food (RRR 0.48, 95% CI 0.29-0.82, p=0.007) and a high score in the happiness domain (RRR 0.74, 95% CI 0.59-0.92, p=0.007). The expected risk of being overweight increased with age (RRR 1.09, 95% CI 1.04 -1.15, p<0.001) and was higher for subjects with weak (RRR 2.20, 95% 1.54-3.16, p<0.001) or very weak (RRR 2.26, 95% CI 1.36-3.77, p=0.002) self-control regarding food, for those who reported that their body perception negatively influences their social life (RRR 2.63, 95% CI 1.34-5.13, p=0.005), for those with the worst opinion on their attractiveness ("It is false that I am attractive": RRR 2.83, 95% CI 1.57 – 5.09, p=0.001; "It is absolutely false that I am attractive": RRR 5.09, 95% CI 2.65-9.81, p<0.001), and for those with a high score in the happiness domain (RRR 1.23, 95% CI, 1.02-1.48, p=0.030). On the contrary, the expected risk of being overweight was lower for those who wanted to value their legs (RRR 0.49, 95% CI 0.31-0.77, p=0.002) and buttocks (RRR 0.29, 95% CI 0.15-0.56, p<0.001) while dressing.

Discussion and Conclusions

Our cross-sectional survey analyzed the association between Italian youth's BMI and their psychological well-being and lifestyle using the EPOCH measure.

This study showed that youth is a crucial period in life and involves multiple physiological and psychological changes, including perception of one's body, self-control regarding food, and happiness domain.

Firstly, our findings showed a homogeneous distribution of population by BMI index (underweight, normal, and overweight), between adolescents and young adults (< 18 and ≥ 18 years), as well as Italian geographical distribution (rural, underground, and metropolitan areas), occupation, drinking habit, sex frequency, engagement, optimism, and connectedness domains.

The average age and self-perception in eating, drinking, and sexual behaviors showed differences among the weight indexes. The mean age of overweight subjects was significantly different from that of the underweight and normal weight categories. In eating habits, the underweight and normal weight groups showed higher self-control and a positive feeling regarding food than overweight respondents, who were more likely to feel guilty after a meal. A similar trend was observed regarding body perception and its impact on sex life: the underweight and normal weight groups reported higher positive feelings and overweight respondents reported more negative feelings. Overweight respondents reported higher alcohol consumption to overcome the abovementioned negative feelings, and normal weight respondents reported drinking to boost their self-confidence. Regarding the psychological aspects of wellness measured by the EPOCH model and considering BMI and age variables, the perseverance and connectedness characteristics were lower in the overweight group. Regarding lifestyle and daily habits, our findings showed that underweight respondents, especially the female population, have strong self-control regarding food; the overweight condition increases with aging and is associated with weak self-control regarding food and a negative self-body perception and satisfaction. The results of multinomial logistic regression analyses showed that being female, having strong self-control regarding food, and valuing their legs and buttocks while dressing were significant factors of being underweight, whereas the risk of being underweight was lower for those with weak self-control regarding food and a high score in the happiness domain. The expected risk of being overweight increased with age and was higher for those with weak or very weak self-control

Table 4. Comparison of the demographic and psychological measurements by BMI classes.

	BMI			p-value
	Underweight (1) n=152	Normal (2) n=770	Overweight (3) n=299	
Age (years), mean ± SD	18.22±2.87	18.51±2.99	19.13±3.39	0.003*
Age group, n (%)				0.143**
<18 years	81 (53.29)	380 (49.35)	132 (44.15)	
≥18 years	71 (46.71)	390 (50.65)	167 (55.85)	
Sex, n (%)				0.019**
Male	17 (11.18)	141 (18.31)	66 (22.07)	
Female	135 (88.82)	629 (81.69)	233 (77.93)	
Geographical distribution, n (%)				0.175**
North	63 (41.45)	325 (42.21)	113 (37.79)	
Middle	47 (30.92)	206 (26.75)	74 (24.75)	
South	42 (27.63)	239 (31.04)	112 (37.46)	
Occupation, n (%)				0.088**
Student (high school)	109 (71.71)	519 (67.40)	182 (60.87)	
College Student	28 (18.42)	130 (16.88)	55 (18.39)	
Master Student/worker	9 (5.92)	83 (10.78)	39 (13.04)	
Unemployed	6 (3.95)	38 (4.94)	23 (7.69)	
1. My self-control regarding food is: n (%)				<0.001**
Very strong/Strong	43 (28.29)	107 (13.90)	13 (4.35)	
Normal	75 (49.34)	375 (48.70)	96 (32.11)	
Weak	22 (14.47)	214 (27.79)	132 (44.15)	
Very weak	12 (7.89)	74 (9.61)	58 (19.40)	
2. Eating makes me feel: n (%)				0.043**
Very good	32 (21.05)	116 (15.06)	33 (11.04)	
Good	38 (25.00)	220 (28.57)	84 (28.09)	
Normal	56 (36.84)	255 (33.12)	99 (33.11)	
Bad/guilty	26 (17.11)	179 (23.25)	83 (27.76)	
3. While dressing, I value my body parts: n (%)				<0.001**
Face	33 (21.71)	226 (29.35)	118 (39.46)	
Breasts	31 (20.39)	240 (31.17)	131 (43.81)	
Legs	48 (31.58)	175 (22.73)	37 (12.37)	
Buttocks	40 (26.32)	129 (16.75)	13 (4.35)	
4. How I perceive my body affects my social life: n (%)				<0.001**
Positively	44 (28.95)	171 (22.21)	17 (5.69)	
No influence	59 (38.82)	304 (39.48)	89 (29.77)	
Negatively	49 (32.24)	295 (38.31)	193 (64.55)	
5. I am used to drinking: n (%)				0.982**
No more than once per week	118 (77.63)	592 (76.88)	229 (76.59)	
Almost 2 times per week	27 (17.76)	139 (18.05)	57 (19.06)	
Almost 4 times per week	7 (4.61)	39 (5.06)	13 (4.35)	
6. Drinking helps me to: n (%)				0.020**
Be a part of the group	24 (15.79)	164 (21.30)	76 (25.42)	
Feel like others	19 (12.50)	73 (9.48)	42 (14.05)	
Feel more confident	58 (38.16)	293 (38.05)	85 (28.43)	
Forget my issues	51 (33.55)	240 (31.17)	96 (32.11)	
7. My sex frequency is: n (%)				0.532**
Never	68 (44.74)	306 (39.74)	134 (44.82)	
Rarely	16 (10.53)	99 (12.86)	34 (11.37)	
Sometimes	29 (19.08)	138 (17.92)	58 (19.40)	
Often	39 (25.66)	227 (29.48)	73 (24.41)	
8. How I perceive my body affects my sex life: n (%)				<0.001**
Positively	58 (38.16)	232 (30.13)	32 (10.70)	
No influence	47 (30.92)	265 (34.42)	101 (33.78)	
Negatively	47 (30.92)	273 (35.45)	166 (55.52)	
9. My body is attractive: n (%)				<0.001**
Almost true/true	56 (36.84)	201 (26.10)	26 (8.70)	
Sometimes	50 (32.89)	332 (43.12)	68 (22.74)	
Almost false	34 (22.37)	155 (20.13)	103 (34.45)	
False	12 (7.89)	82 (10.65)	102 (34.11)	
Engagement Domain mean ± SD	2.83±0.79	2.78±0.79	2.73±0.79	0.420*
Perseverance Domain mean ± SD	3.09±0.95	3.15±0.90	2.98±0.92	0.023*
Optimism Domain mean ± SD	2.58±0.96	2.68±0.93	2.58±0.95	0.238*
Connectedness Domain mean ± SD	3.53±1.09	3.50±1.10	3.38±1.09	0.229*
Happiness Domain mean ± SD	2.83±0.99	2.97±0.94	2.82±0.93	0.037*
	Post hoc analysis			
	1 vs 2	1 vs 3	2 vs 3	
Age	0.889***	0.009***	0.009***	
Sex	0.092**	0.005**	0.168**	
Self-control regarding food	<0.001**	<0.001**	<0.001**	
Eating makes me feel	0.107**	0.006**	0.230**	
Valuing parts of body when dressing	<0.001**	<0.001**	<0.001**	
Body perception in social relations	0.154**	<0.001**	<0.001**	
Drinking alcohol	0.351**	0.058**	0.009**	
Body perception in sex life	0.149**	<0.001**	<0.001**	
Attractive body feeling	0.021**	<0.001**	<0.001**	
Perseverance Domain	1.000***	0.660***	0.018***	
Happiness Domain	0.282***	1.000***	0.071***	

*Using one-way ANOVA test. **using χ^2 test. ***Using Bonferroni's test.

regarding food, for those who reported that their body perception negatively influenced their social life, for those who had a negative opinion on their attractiveness, and for those with a high score in the happiness domain; on the contrary, the expected risk of being overweight was lower for those that wanted to value their legs and buttocks while dressing.

The psychological wellness of girls and young women did not seem strongly affected by BMI according to the EPOCH measure. The Engagement, Optimism, and Connectedness domains were not significantly affected by the BMI variable. Moreover, the above positive characteristics cannot be considered predictive of wellness associated with BMI. On the contrary, Perseverance and Happiness seemed reduced with increasing BMI and were related to physical shape.

Gerlach *et al.*'s review (2015) of several studies based on a bio-socio-ecological system model focused on body weight and personality traits as protective and/or risk factors. Gerlach *et al.* (2015) identified neuroticism, impulsivity, and sensitivity to reward as risk factors, whereas conscientiousness and self-control as protective factors of internal regulation. George *et al.* (2014) developed psychological interventions to deal with the overweight/obesity conditions, fostering and strengthening self-control skills in individuals. However, their results related to the rehabilitation system. Our findings offer a different perspective: promoting the development of positive psychological characteristics to boost quality of life by improving wellness. Our findings are interesting as they could help develop preventive health education and psychological interventions to foster and boost actions toward the reinforcement of perseverance and happiness in underweight and overweight youth. By the EPOCH framework, cultivating and enhancing psychological characteristics such as perseverance in underweight and overweight adolescents and young adults could reinforce specific psychological aspects in them regarding future wellness, improving the positive perception and management of their own health. In a previous study (Di Giacomo *et al.*, 2018), underweight participants seemed happier than overweight participants because their physical shape is closer to the sociocultural model of thinness, but this is an emotional condition and does not reflect their wellness attitudes. Moreover, the desire of or adherence to the thinness model cannot be considered a protective factor, as it makes youth vulnerable and is a risk factor for adulthood because of the focus on the achievement of a socio-culturally accepted appearance; this leads them to neglect healthy behaviors that can help them manage their own body. This paper can contribute to a better understanding of why health-related messages are not as effective as expected in the adolescent population. Along with the its theoretical outcomes, our research has important clinical implications: from a clinical point of view, nonclinical factors and, specifically, social and cultural influences, as well as the development of young generation adapting themselves to the context's features might contribute to the increased and favor the risk of physical and mental disease in adulthood because of the detriment of psychological aspect of wellness already in early age. Improving strategies to manage positive characteristics during growth could help support the young generation in becoming competent, having the courage to stick with their goals, achieving their objectives by overcoming obstacles, and dealing with continual challenges. This could help to prevent and/or reduce the adoption of unhealthy behaviors, improving their psychological resilience and making them prioritize their own health by active living, starting from getting into shape, then moving toward managing self-perceptions and taking better care of themselves.

The strengths of the study are the sample size and the homogeneous geographical area distribution of the sample, so it can be

Table 5. EPOCH Measure comparison by age group stratified by BMI.

	Age <18 years (n=593)				Age ≥18 years (n=628)				Age <18 years vs ≥18 years		
	Underw. (1) n=81	Normal (2) n=380	Overw. (3) n=132	p-value *	Underw. (1) n=71	Normal (2) n=390	Overw. (3) n=167	p-value*	p-value* 1	p-value* 2	p-value* 3
Engagement Domain mean ± SD	2.84±0.79	2.73±0.80	2.74±0.83	0.498	2.81±0.81	2.84±0.78	2.72±0.75	0.289	0.801	0.055	0.881
Perseverance Domain mean ± SD	2.99±0.88	3.16±0.91	3.02±1.01	0.188	3.21±1.00	3.15±0.89	2.95±0.86	0.033	0.165	0.951	0.524
Optimism Domain mean ± SD	2.64±1.03	2.66±0.94	2.58±0.98	0.700	2.52±0.88	2.70±0.92	2.59±0.93	0.207	0.439	0.590	0.913
Connectedness Domain mean ± SD	3.42±1.10	3.43±1.10	3.23±1.12	0.187	3.66±1.08	3.56±1.09	3.50±1.06	0.569	0.185	0.120	0.038
Happiness Domain mean ± SD	2.83±1.06	2.94±0.97	2.77±0.96	0.211	2.82±0.90	2.99±0.90	2.86±0.91	0.142	0.951	0.434	0.434

Post hoc analysis. Perseverance Domain (using Bonferroni's test): 1 vs 2 (1.000); 1 vs 3 (0.131); 2 vs 3 (0.048). *using one-way ANOVA test.

considered representative of the Italian adolescent and young adult population. Another focal point is the application of the new framework of EPOCH to a large sample.

The limitation of the study is the low male participation, which implies that the association between body shape and wellness is perceived as a female domain.

Future studies need to include a realistic intervention strategy proposed to achieve the goals of understanding and effectively enhancing the psychological well-being and lifestyle habits of youth in Italy. Ongoing research is being conducted to investigate the impact of cultural background in wellness and quality of life in youth involving different European and Pan-European countries. In our opinion, it could be interesting to examine the needs of youth in terms of weaknesses and strengths. Future research should also explore the benefits of using social media to promote psychological wellbeing and to improve self-acceptance and body image, especially among young people (Martinus *et al*., 2016).

Table 6. Estimated relative risk ratios of being underweight or overweight by multinomial logistic regression.

	Underweight			Overweight		
	RRR	IC 95%	p-value	RRR	IC 95%	p-value
Age	0.93	0.87 – 1.01	0.057	1.09	1.04 – 1.15	<0.001
Sex						
Male[a]	1			1		
Female	2.28	1.25 – 4.15	0.007	0.82	0.55 – 1.22	0.323
1. My self-control regarding food is:						
Very strong/Strong	2.51	1.56 – 4.04	<0.001	0.54	0.28 – 1.04	0.064
Normal[a]	1			1		
Weak	0.48	0.29 – 0.82	0.007	2.20	1.54 – 3.16	<0.001
Very weak	0.80	0.39 – 1.65	0.542	2.26	1.36 – 3.77	0.002
2. Eating makes me feel:						
Very good	1.58	0.93 – 2.71	0.093	0.65	0.38 – 1.12	0.119
Good	0.95	0.59 – 1.54	0.842	1.09	0.73 – 1.64	0.664
Normal[a]	1			1		
Bad/guilty	0.60	0.34 – 1.05	0.075	0.67	0.43 – 1.04	0.077
3. While dressing, I value my body parts: n						
Face[a]	1			1		
Breasts	0.84	0.49 – 1.45	0.534	1.17	0.82 – 1.66	0.394
Legs	1.74	1.04 – 2.91	0.034	0.49	0.31 – 0.77	0.002
Buttocks	1.75	1.01 – 3.05	0.048	0.29	0.15 – 0.56	<0.001
4. How I perceive my body affects my social life:						
Positively	0.87	0.51 – 1.46	0.592	1.82	0.97 – 3.43	0.062
No influence[a]	1			1		
Negatively	0.67	0.36 – 1.26	0.213	2.63	1.34 – 5.13	0.005
6. Drinking helps me to:						
Be a part of the group[a]	1			1		
Feel like others	1.57	0.78 – 3.17	0.206	1.43	0.84 – 2.46	0.190
Feel more confident	1.26	0.73 – 2.16	0.402	0.69	0.46 – 1.05	0.083
Forget my issues	1.37	0.79 – 2.36	0.266	0.94	0.62 – 1.42	0.761
8. How I perceive my body affects my sex life:						
Positively	0.71	0.43 – 1.17	0.175	1.59	0.95 – 2.65	0.076
No influence[a]	1			1		
Negatively	0.75	0.42 – 1.35	0.334	1.30	0.75 – 2.26	0.341
9. My body is attractive:						
Almost true/true	0.69	0.43 – 1.13	0.145	1.09	0.63 – 1.88	0.764
Sometimes[a]	1			1		
Almost false	1.35	0.72 – 2.53	0.351	2.83	1.57 – 5.09	0.001
False	0.86	0.36 – 2.05	0.735	5.09	2.65 – 9.81	<0.001
Perseverance Domain	0.87	0.71 – 1.07	0.196	0.92	0.77 – 1.10	0.352
Happiness Domain	0.74	0.59 – 0.92	0.007	1.23	1.02 – 1.48	0.030

[a]reference category; RRR: relative risk ratio.

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