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ORIGINAL ARTICLE

Personality traits and athletic young adults

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Abstract

Purpose Doing regular physical activity offers many positive physiological and psychological advantages. According to the literature there exist some correlations between personality traits and physical activity, which are related to gender diversity. The aim of this study was to investigate the relationship between personality traits, self-efficacy, body image and psycho-physical well-being, in 145 athletically active young adults (65 males and 80 females).

Methods The participants completed the following: Big Five Questionnaire Short-version, Self-efficacy scale, Silhouette Figure Body Images, Body Mass Index, and digit ratio.

Results Positive correlations were found between openness to experience and conscientiousness ($p < 0.05$) in both males and females. Real image values and ideal image values were significantly related among them ($p < 0.001$).

Conclusion In conclusion, we can affirm that personality traits can influence the idea of body image so much that it can go beyond the objective reality of self-image.

Keywords Personality · Optimistic self-beliefs · Body dimension · Aggressiveness · Sport

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Introduction

The body image is a multidimensional construct, which does not just refer to the body as an individual sees it in front of a mirror, but also, and above all, to the perception and evaluation individuals have of it. The body is the representation of an imaginative body that changes continuously and of which individuals are trying to maintain a coherent image in relation to personal identity, family and social context [1].

The psychological discrepancy that a person experiences between his own body and the ideal one can cause a negative feeling of self and harmful behaviors for health [2]. Unfortunately, one of the most important consequences that follows these concerns is social retreat, dictated by the desire to escape the gaze of others, perceived as judging and over-critical.

In addition, subjects usually misinterpret the expressions of others referring to them as hostile, increasing the concern for perceived ugliness in a vicious, spiraling circle [3]; these subjects, therefore, tend to avoid those situations where they could not hide the perceived defect [4, 5], resulting in anxious and somatic symptoms [6, 7].

Doing regular physical activity offers a great deal of positive physiological and psychological advantages. Research has shown a set of psychological dimensions that could characterize people who attend gyms from the rest of the population [8–10]. It is known that a good perception of one's own body allows the individual to positively influence self-esteem, self-efficacy and mood [11, 12].

Rhodes and Smith [13] identified a correlation between personality traits and physical activity. According to Fallon and Hausenblas [14], the influences on the perception of the ideal female body are very frequent, with consequences on the mood [15, 16]. Nevertheless, the study revealed how frequent physical activity can appease this influence although it remains invasive. The literature reported another aspect related to gender diversity in sports: females practice less physical activity than males [17].

De Bruijn et al. [18] studied personality traits by observing that successful enactment in moderate physical activity was associated with extroversion, subjective norm, and affective attitude, whereas successful enactment in vigorous physical activity was associated with conscientiousness. Findings illustrate the differential role played by personality dimension theory of planned behavior (TPB).

Allen et al. [19] studied the possible correlation of coping strategies, sport performance and personality traits. The authors analyzed 253 athletes and reported the following results that "conscientious athletes (main effect), and athletes displaying high levels of extraversion, openness, and agreeableness (a three-way interaction effect), reported a greater use of emotion-focused coping strategies, and athletes with low levels of openness, or high levels of neuroticism (main effects), reported a greater use of avoidance coping strategies. Different personality characteristics were observed between higher-level and lower-level athletes, between male and female athletes, and between individual and team sport athletes. These findings suggest that the five-factor model of personality can help distinguish various levels of athletic involvement and can help identify the coping strategies athletes are likely to adopt during participation".

The aim of this study was to investigate the relationship between personality traits, self-efficacy, body image and psycho-physical well-being, considering the possible mediating role of what engaged them to practice physical activity.

Materials and methods

Participants

Data were collected on a sample of 300 volunteer athletes, members of the Virgin Active gym in Catania. From these 145 subjects became our sample, of which were 65 males and 80 females with a mean age of 32 years (SD ± 8.3).

The participants were selected according to the amount of sport practiced: subjects who participated in at least one competition over the previous 12 months, and those had a minimum of four weekly training sessions for at least 2 h, during the previous 12 months. The research lasted for 1 year; assessment took place in the Virgin Active gym in Catania, during training. The study obtained ethical permission from the University Internal Review Board for psychological research at the University "KORE" of Enna. Informed consent was obtained from participants after having explained the general information about the research goals. Anonymity and confidentiality in reporting study results were assured.

Measures

Subjects were administered the big five short test, self-efficacy evaluations test, Silhouette Figure Body Images Test, digit radio and Body Mass Index.

Big five short

A reduced form of the ten item Big Five Questionnaire (BFQ) [20] was used to ease the test administration.

The BFQ is a self-evaluation test which investigates personality traits, grouped in ten sub-dimensions: dynamism, dominance, cooperativity, friendliness, scrupulosity,

perseverance, emotion control, impulse control, openness to culture and openness to experience. It identifies five fundamental dimensions for describing and evaluating everyone's personality:

- Extraversion (E), which is inherent in a confident and enthusiastic orientation towards the various circumstances of life, most of which are interpersonal;
- Amicability (A), which includes, on the one hand, features such as altruism, caring, giving emotional support, and, on the other, features such as hostility, indifference to others and selfishness;
- Conscientiousness (C), which refers to features such as accuracy, reliability, responsibility and perseverance;
- Emotional stability (S), which is a very large dimension comprising a variety of features related to anxiety and emotional problems such as depression, mood instability and irritability;
- Mental openness (M), which refers to an openness to new ideas, to the values of others and to one's own feelings.

The BFQ showed excellent internal with papers of Peluso et al. [21].

Self-efficacy

To assess self-efficacy, the Italian version of the General Self-Efficacy Scale was used [22]. It is a ten-item psychometric scale that is designed to evaluate optimistic self-beliefs to cope with a variety of difficult demands in life. The scale was originally developed in German by Matthias Jerusalem and Ralf Schwarzer in 1981 and has been used in many studies with hundreds of thousands of participants [23]. In contrast to other scales that were designed to assess optimism, this one explicitly refers to personal agency, i.e., the belief that one's actions are responsible for successful outcomes. Perceived self-efficacy is a prospective and operative construct. For each item, participants express agreement or disagreement on a four-point Likert type scale ranging from "not at all true" (1) to "exactly true" (4). Examples of items are the following: "can always manage to solve difficult problems if I try hard enough"; "If someone opposes me, I can find the means and ways to get what I want"; "It is easy for me to stick to my aims and accomplish my goals". In samples from 23 nations, Cronbach's alphas ranged from 0.76 to 0.90, with the majority in the high 0.80 s.

Silhouette Figure Body Images

The stimulating silhouette was used, this method was introduced, designed and validated by Stunkard and collaborators as a self-evaluation of body dimension [24]. The standard management of Stunkard's silhouette consists in asking participants to choose the image that resembles their own the most and to choose another one that correspond to the one they would like to have. To measure body size, respondents were asked to pick the picture that best represents their own body size. Besides assessing respondents' own perceived body size, silhouettes have also been used to measure other important concepts in health psychology and nutritional science such as ideal body size for assessing body size dissatisfaction as a potential motivating factor for losing weight through increased exercise or dieting (Fig. 1).

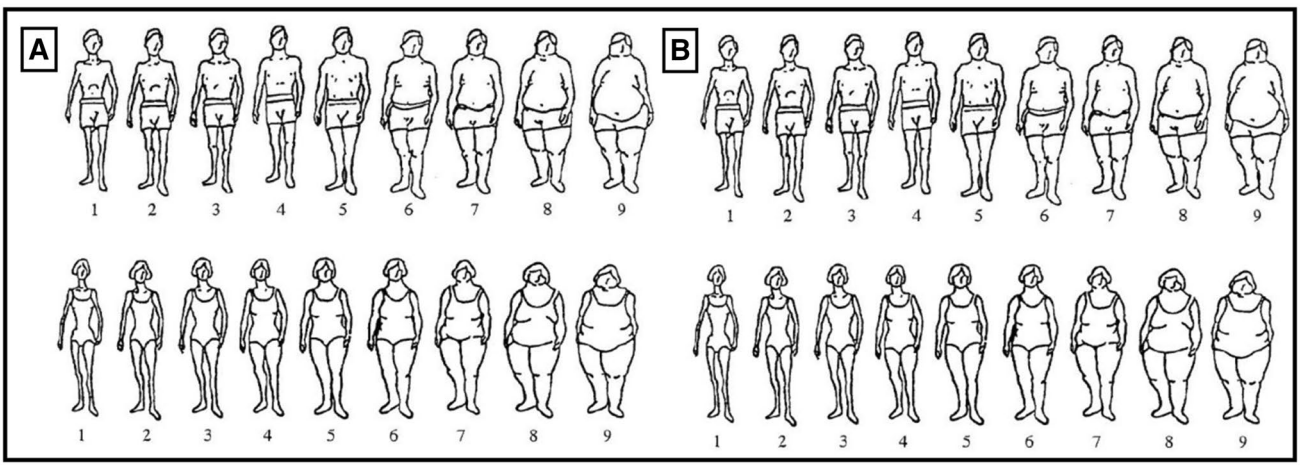

Fig. 1 The "Silhouette Figure Body Images Test", the subjects must select and circle the figure they think corresponds to their real size (**a**) and then select and circle the figure they think corresponds to their ideal size (**b**)

This procedure provides three values: current size, desired size and a disparity evaluation (current/desired), which is interpreted as "body dissatisfaction measure".

Body Mass Index (BMI)

Body Mass Index [25] is a simple index of weight–height that is usually used to categorize underweight, overweight and obesity. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m^2).

Digit ratio

Ratio between index finger and ring finger (2D:4D) called digit ratio, is a useful instrument to evaluate testosterone levels which subjects have been exposed to during intrauterine life. This level can influence behavior and positive aggressiveness, intended as the capacity to confront rapidly and decisively difficulties and obstacles (Fig. 2). The hands of the subjects were photocopied [26, 27] and the measurement from metacarpal-phalanx crease to the tip of the finger was taken.

Statistical analysis

Data were collected and averaged, and then compared using one-way repeated measures ANOVA (Friedman test) followed by Dunn's Multiple Comparison Test. We performed a Chi square test. Correlation analysis was carried out using one-tailed Pearson's correlation. Significance was set at $p < 0.05$ and all data are reported as mean ± standard deviation (SD). Cronbach's alpha was used to estimate the reliability of our psychometric tests [28]. All analyses were performed by mean of GraphPad Prism version 6.00 for Windows (GraphPad Software, La Jolla, California, USA).

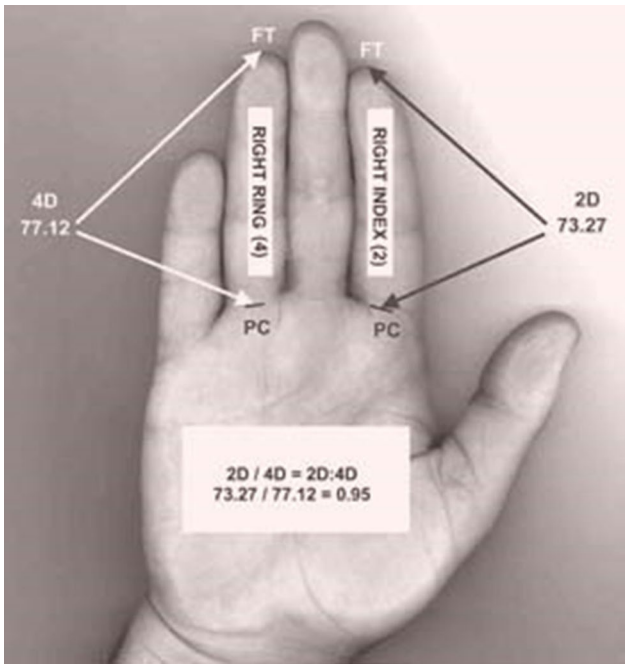

Fig. 2 The method of the radio measuring digit. A photocopy is made of the right hand of the subject, then the measurement of the second (2D) and fourth digit (4D) is made

Results

Big five short

The correlation analysis between sub-scales of the Big Five Questionnaire showed the presence of positive and statistically significant correlations between openness to experience and conscientiousness ($p < 0.05$) in both males and females. The analysis of the average scores showed that conscientiousness values are the same for females and males, equal to 3.9. Values for openness to experience were positive in both females and males (3.7 for females and 3.6 for males).

Self-efficacy

Regarding the self-efficacy scale, the frequency distribution showed that 28% of females and 39% of the males requested attention, with statistical significance from the Chi square test, $p < 0.0122$. Furthermore, 35% of the females and 29% of the males obtained average self-efficacy values with a statistical significance from the Chi square test with $p < 0.0408$, while 37% of the females and 32% of the males showed a high self-efficacy, without statistical significance from the Chi square test with $p < 0.0502$.

Silhouette Figure Body Images

The whole sample showed a statistically relevant difference between real image values and ideal image values ($p < 0.001$). The score for real image was 4.4 (± 1.15) while the score for ideal image was 3.6 (± 0.82). Data clearly showed that the participants were not satisfied with their body (Fig. 3a). Figure 3b shows the results obtained divided per gender; females obtained a score for real image perception of 4.6 (± 1.02) while their ideal image score was 3.5 (± 0.8), this means females would like to be about one and a half sizes less. Males obtained a score for real image perception of 4.2 (± 1.2) while ideal image score was 3.6 (± 0.8), this means men would like to have about one size less.

Body Mass Index (BMI)

As concerns the Body Mass Index, the whole sample had a normal weight and presented a mean BMI value of 23.29

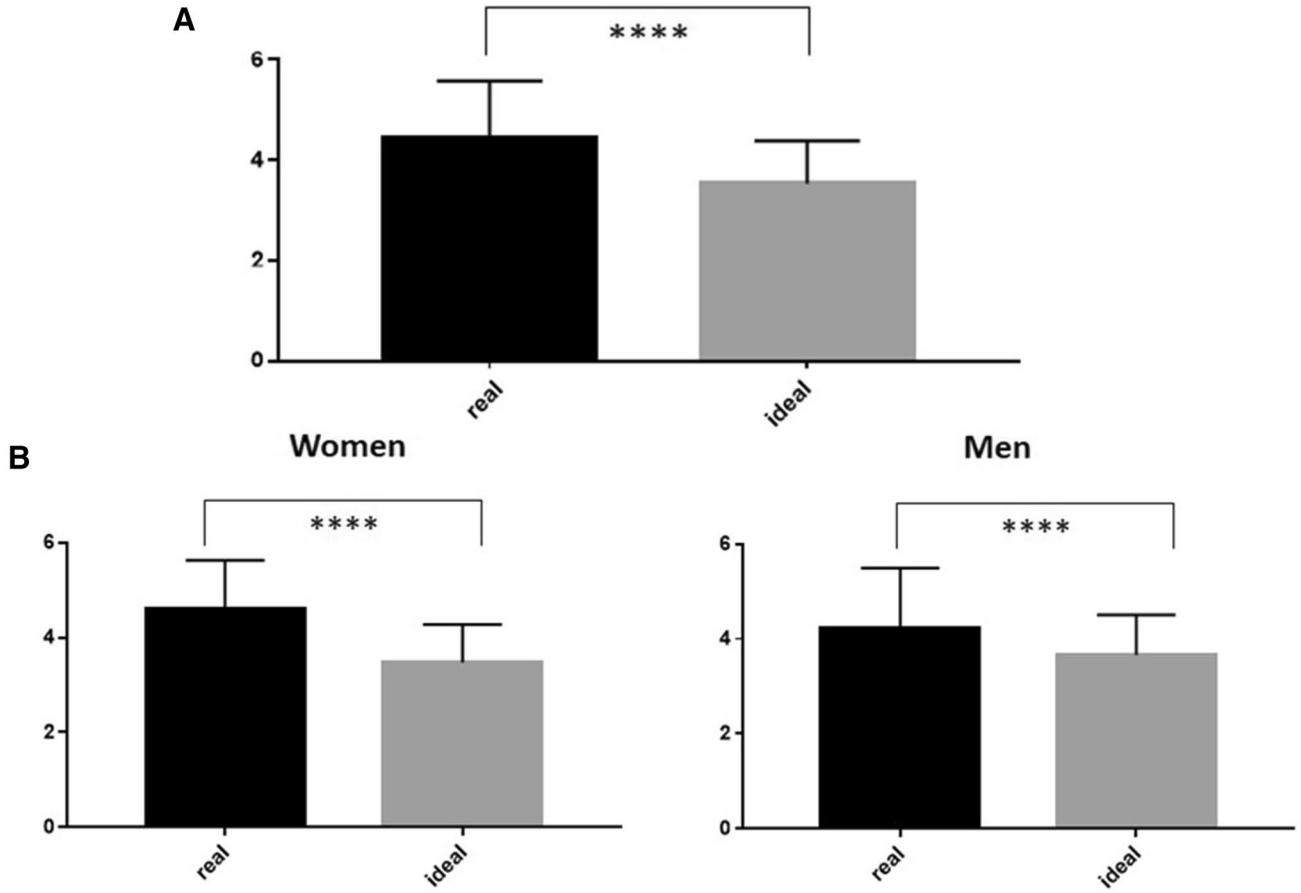

Fig. 3 **a** The results obtained from the "Silhouette Figure Body Images Test" from the whole sample. **b** The results obtained from the "Silhouette Figure Body Images Test" in relation to gender. Values are expressed as mean and show a significant difference between the real image and the ideal image in both genders

(±3.9), females had a value of 22.53 (±4.01) while males were 24.23 (±3.7).

Digit ratio

Regarding the correlation between the digit ratio score and trait personality, the comparison between average scores showed that values obtained from the whole sample from 2D:4D ratio are correlated to conscientiousness (Fig. 4), with Pearson r, $r = -0.8999$, R squared $= 0.8098$, $p < 0.0001$ (****).

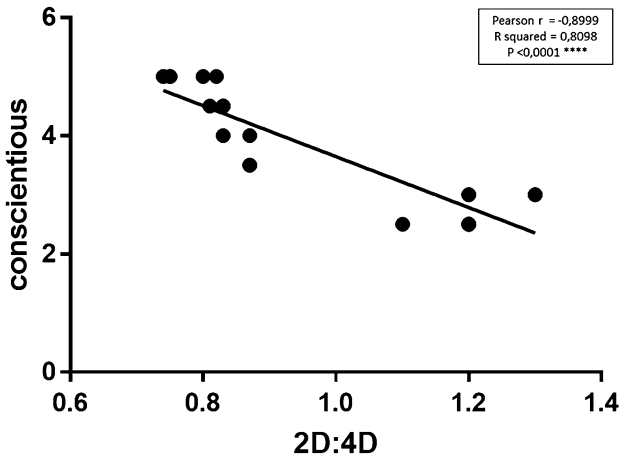

Fig. 4 The results obtained from the correlation between the digit ratio and the conscience variable of the Big Five Questionnaire. There was a correlation between the 2D relationship: 4D and conscientious variable

Discussion

The results obtained from our research show that a conscientious personality and openness to experience is directly related to sport. The data are confirmed by the conscientious personality trait observed by Rhodes and Smith [13, 29].

We also observed that the risk provision recorded with 2D:4D ratio is related to the feature of conscientiousness

personality. For many years, numerous studies about personality in sports environments have been realized with the aim of finding a set of constant psychological dimensions that could characterize athletes from the rest of the population [10, 29], this is not yet fully clarified for the heterogeneity of the sample and probably because of a lack of a necessary definition of "sports/athletic type", trying to identify the specific characteristics that may characterize the figure [30–42].

With regard to the image of the body parameter we are faced with a sample of sports that despite having a perfect physical form does not perceive it as such. The entire sample shows a desire for weight loss equal to one size without gender distinction.

Even Díaz and Blanquez [43], in 2001, observed a general dissatisfaction and a lack of acceptance of body image by detecting a greater percentage in females. While in 2010, Ramos et al. [44] observed an inversion of this phenomenon, observing a greater percentage of dissatisfaction of body image more in males than females, data that were also observed by López Sánchez et al. [45] in 2018 in adolescents and Spanish children.

Self-esteem levels show a heterogeneity of the sample that is distributed in the three categories of request for attacks, which are significant.

The theory of affective regulation [46], however, suggests that sport has two effects on the mood of the subject: an improvement in mood in general after training sessions, and a decrease in negative emotional states (anxiety, irritability and sense of guilt) [47]; furthermore, while the positive effects are temporary, the negative ones are greater when the training sessions are farther apart [48]. Consistent with affect regulation hypothesis, physical activity results in improvements in positive mood states and a decrease in negative mood states; as the exercise cycle continues, increased amounts of exercise are needed to experience improvements in affect and general mood [41].

Doubtless, taking care of the body aims not only at health but also at an exterior image that reflects beauty standards; according to psychology, the perception of the body establishes the identity of the individual and influences self-esteem and mood [48].

Based on the data from our sample we can assume that: "at any age, media conditioning is very strong; we should continue with physical activity with the awareness that it represents life and health for our body, becoming sometimes a true elixir of life" [41].

Conclusion

Physical activity has, undoubtedly, beneficial effects on the individual's health, resulting in improved cardiovascular and psychological condition. Unfortunately, the same effects are not observed between the concept of physical activity and self-image.

The results we obtained reflect the conclusions reached by the Fallon and Hausenblas group [14], the authors observed how media information about the physical aspect significantly affected the population without any exclusion of categories, which unfortunately, leads us to believe that often we do not choose to practice sport for physical well-being but fall into well-defined esthetic.

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Compliance with ethical standards

Conflict of interest The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

Ethical approval The study obtained ethical permission from the University Internal Review Board for psychological research at the University "KORE" of Enna.

Informed consent Informed consent was obtained from all individual participants included in the study.

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