The Body Dissatisfaction Role in the Adoption of Compulsive Healthy Eating Behaviors

Abstract

The purpose of this study is to investigate the effect of Instagram use, fitness and health-related content, internalization, social comparisons, perfectionist, and obsessive-compulsive personality traits on body dissatisfaction and Orthorexia Nervosa. A survey-based study with a sample of 238 respondents has been developed to test the proposed model, using the structural equation modelling. The data analysis shows that the main factors that influence body dissatisfaction and Orthorexia Nervosa are the internalization of beauty ideals, social comparisons (both upward and downward) and perfectionism. Body dissatisfaction mediates the path from internalization, upward and downward comparisons and perfectionism from one side and Orthorexia Nervosa on the other side. Based on the findings, the study concludes with discussing the theoretical contributions and providing actionable managerial implications.

1. Introduction

The term Orthorexia Nervosa (ON) was first used in 1997 by Steven Bratman and emerged from the combination of the Greek words *orthos* (accurate) and *orexis* (hunger) meaning obsession with heathy food (Brytek-Matera, 2012). Originally, Bratman described ON as a pathological fixation with a pure and healthy diet to improve health and wellbeing (Bratman & Knight, 2000). While ON is recognized in the literature as an eating disorder or an Obsessive-Compulsive (OC) condition (Olejniczak et al., 2017), it is not present in the current *International Statistical Classification of Diseases and Related Health Problems* (ICD-11) (World Health Organization, 2020) n or in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) (American Psychiatric Association, 2013). In 2016, Steven Bratman updated ON definition indicating that new features, in addition to maintaining its original characteristics, should be considered. He also pointed out that social media (SM) platforms, such as Instagram, are contributing to the development of ON not only for health reasons but also for reasons that have to do with appearance (Bratman, 2016).

Health and wellness awareness and expertise have become key concerns in the developed countries (Chaki et al., 2013), and people are now searching for diet and physical activity information on SM (Vaterlaus et al., 2015), that led to the growth of health and fitness-related content on these platforms introduced largely by personal trainers, gyms, sportswear brands and fitness influencers, and excessively in image-focused SM platforms such as Instagram. Instagram enables its users to post photos where, by using some filters, they look more attractive, presenting an idealized version of themselves which reinforces the ideals of beauty and increases the extent to which these ideals are internalized. The fixation on appearance may contribute to the internalization of the athletic ideal as well as to social comparisons that can influence the perception of the viewer's body image (Fardouly et al., 2018). *Social Learning Theory* claims that through media and social observations, people learn and model their behavior, attitudes and values according to what is accepted by society (Bandura, 1977, 1986). On another hand, according to the *Social Comparison Theory*, individuals judge themselves according to the ideals they are subjected

to in the media (Festinger, 1954). Both internalization and social comparisons seem to have an impact on the development of body image concerns and dissatisfaction (Carrotte et al., 2015; Fardouly et al., 2017, 2018; Lup et al., 2015; Perloff, 2014; Shaw & Waller, 1995; Tiggemann & Polivy, 2010; Tiggemann & Zaccardo, 2015).

Additionally, the *Sociocultural model* suggests that media use contributes to internalization (IN) and social comparisons (Upward (UP) and Downward (DO)), that have effects on body image perceptions leading to Body Dissatisfaction (BD) and consequently contributes to the development of eating disorders (Thompson & Heinberg, 1999). BD is considered as one of the most robust risk factors for the development of dietary problems and eating disorders, such as limit food intake and adoption of exaggerated and rigid diets to attain the perfect physical form (Bruch, 1962; Thompson & Heinberg, 1999). Nevertheless, certain personal features may predispose or make people more susceptible or vulnerable to be influenced by SM and ultimately to the development of this eating concerns. In this sense, personality traits can make an individual more conducive to develop ON. Previous research addresses some personal features that may increase the risk of ON and other eating disorders. These personal features are perfectionist (PF) and Obsessive-Compulsive (OC) personality traits (Bardone-Cone et al., 2007; Barnes & Caltabiano, 2017; Koven & Wabry, 2015; Oberle et al., 2017; Parra-Fernández et al., 2018). Regarding OC traits, there is still no consensus among specialists whether or not it is related to this pathology (Brytek-Matera et al., 2017; Oberle et al., 2018; Segura-García et al., 2012)..

Based on the above discussion, the current study aims to investigate the effect of social and personal factors on BD and ON. This research paper is expected to provide actionable managerial implications for brands, marketers, and other engaged stakeholders to encourage healthy consumer behavior and limit the detrimental impact of societal and personal factors on the adoption of compulsive healthy eating behaviors.

2. Literature Research

2.1 Orthorexia Nervosa

The extreme behaviors regarding food can have consequences in terms of physical health and psychological wellbeing and can also have social consequences. Regarding physical health, orthorexic individuals may develop nutritional and mineral deficiencies because entire food groups with important nutrients are omitted from their diets (Bratman & Knight, 2000). Some authors show anecdotal evidence that ON can lead to the same medical complications as anorexia nervosa, including osteoporosis, brady cardia and testosterone deficiency (Bratman & Knight, 2000; Moroze et al., 2015). Psychologically, the symptoms of ON are described by orthorexic individuals as an overwhelming obsessive desire to be healthy and pure (Bratman & Knight, 2000). This pathology also starts to control the individuals who suffer from it, that is, when orthorexic individuals cannot, for some reason, comply with their own eating and preparation rules they experience feeling of guilt, remorse, self-loathing and frustration (Koven & Wabry, 2015). This violation of the dietary rules can be followed by self-punishment, such as more strictive diet, and by purification through fasting (Bratman & Knight, 2000; Chaki et al., 2013). Lastly, individuals with ON claim that they can only keep their diet balanced when they are alone and in charge, they also take a position of superiority, thus do not communicate with those who differ from them, which

can contribute to social isolation (Bratman & Knight, 2000; Oberle et al., 2017). Although ON is a problem acknowledged by health specialists, there scarcity of marketing research about this health condition. In this vein, Duarte et al. (2019) claim it is necessary to deepen knowledge about ON and address the true dimension of this phenomenon. Hence, more research should be conducted in order to understand whether it is already a segment that require further consideration or not.

2.2 Body dissatisfaction

BD is a risk factor for the development of eating disorders, as it promotes diets that are often exaggerated (Bruch, 1962; Stice, 2002). Stice (2002, p. 832) state that BD is "one of the most consistent and robust risk and maintenance factors for eating pathology". In this sense, Segura-García et al. (2012) argue that concerns about weight and body image can lead to unusual traits and obsessive rituals regarding food and exercise in order to keep a strict diet under control. However, there is still no consensus about the influence of BD on the development of ON. On the one hand, the literature suggests that people with ON are not worried about losing weight or their body image; they are worried about the quality of what they eat (Bratman & Knight, 2000). In a sample of Italian female students, as ON became pathological the body concerns or dissatisfaction decreased (Brytek-Matera et al., 2017). On the other hand, for many people the idea of "being healthy" is linked with the idea of body weight and fat mass index, i.e., it is strongly associated with the thin body ideal (Bratman, 2017).

Although BD is an internal issue, it is influenced by several external factors (Slade, 1994). Several researchers concluded that there was a relationship between social comparisons and BD (Lup et al., 2015; Shaw & Waller, 1995; Tiggemann & McGill, 2004; Tiggemann & Polivy, 2010) and others stated that exposure to certain images that highlight the beauty ideals can also lead to the development of BS (Carrotte et al., 2015; Fardouly et al., 2018; Slade, 1994; Tiggemann & Zaccardo, 2015).

2.3 Social Media

According to Statista (2021a), there were 4.66 billion active internet users in January 2021, accounting for 59.5 percent of the global population. Among this total, 4.32 billion used mobile devices to access internet, and 4.2 billion used social networks, which makes, SM platforms used by almost 90% of internet users (Statista, 2021a). SM influences consumers habits and behaviors but also affects the way marketers conduct their businesses. Regardless of the marketer's goal (e.g., promoting a brand, maintaining customers ties), SM platforms have provided marketers with new, exciting, productive and effective ways to reach their target audiences (Tuten & Solomon, 2018). Several SM platforms have a relevant role worth to research.

Instagram

Instagram is the most popular photo capturing and sharing SM application (Hu et al., 2014). According to Mohsin (2021) based on *eMarket* projections, there will be a 73.5 million increase in active

Instagram users in 2021 compared to 2020, implying that the overall number of Instagram accounts will surpass 1 billion for the first time.

Instagram may lead to body and eating concerns, in a wide range of ways. On the one hand, there are several features of Instagram that can contribute to a greater exposure of unrealistic beauty standards. In order to post a photo that goes according to beauty standards, users have the possibility to use filters make them look thinner or more attractive (Fardouly et al., 2018; Mabe et al., 2014; Sidani et al., 2016) However, we can also say that the number of young people seeking for health information on SM has been rising (Cheshire et al., 2020; Moorman et al., 2020; Vaterlaus et al., 2015), being nutrition and fitness the most common health topics among adolescents (Wartella et al., 2016). When users follow health-related pages, this content will appear in their feeds constantly (Carrotte et al., 2015). However, this information is not scientifically validated and can lead to radical attitudes towards health. Users may feel the need to adapt their health eating habits to those they observe on Instagram (McComb & Mills, 2019; Rounsefell et al., 2020).

Previous research has shown that social pressure (from parents, peers, among others) related to appearance has a significant impact on one's perception of their own body image, i.e., increases BD (Helfert & Warschburger, 2011). However, it is possible that SM have strengthened appearance-based social pressure and may even increase the impacts of peer and family pressures regarding appearance. Thompson and Heinberg's (1999) *Sociocultural Model* suggest that the use of SM platforms has a negative effect on body image perception through IN and social comparisons, with SM being a determining factor in the development of BD and, consequently leading to eating disorders. Several studies have looked into the effects of SM on body image perception, and the findings support Thompson and Heinberg's (1999) assumptions indicating that SM constitute a risk factor for the development of BD (Bennett et al., 2020; de Vries et al., 2016, 2019). Looking to the specific case of Instagram, Brown and Tiggemann (2016) found that exposure to celebrity and peer pictures increased BD through appearance comparisons. They also documented that celebrity adulation moderates the effect of celebrity photos on BD.

Instagram's regular upgrades, the growing number of filters that enhance the photographs posted, and the increased power of influencers have all contributed to the platform's growing influence. By 2020, the number of brand-sponsored influencer posts on Instagram exceeded six million, making Instagram's global influencer marketplace a 2 billion U.S. dollar business (Statista, 2021b). Additionally, given that Instagram is an image-focused SM that is highly linked to appearance and is currently one of the most influential platforms, it is important to investigate its effects on BD and, as a result, the development of eating pathologies. Thus, we propose the following hypothesis:

H1a: Instagram's use increases BD.
H1b: BD mediates the relationship between Instagram's use and ON.

2.4 Health and fitness-related content

Influencers and "Fitinspiration"

Individuals, namely adolescents, are affected by numerous outside interests when embracing their consumption patterns, personal image, and lifestyle (Martin and Bush, 2000). Role models are an example of an external factor that can impact consumer behavior behaviors, these are people that consumers have contact with (direct or indirect) and can have an influence on their decisions (Bandura, 1977). The concept of role model is in line with the *Social Learning theory*, which implies that people establish or develop attitudes and behaviors towards consumption through learning experiences, and that these learning experiences can be vicarious, which means that through media and social observations individuals learn and model their behaviors, attitudes, and values according to what is accepted by the society (Bandura, 1977, 1986).

On Instagram, individuals with many followers are perceived as more desirable and reliable (Djafarova & Rushworth, 2017). These people who are famous on SM are also known as influencers, who become role models because of the respect, connection, aspiration, and appreciation that the public generates for them (Kutthakaphan & Chokesamritpol, 2013). Like celebrities, influencers act as a guideline for others in setting up and establishing attitudes and values. Fitness influencers are considered to be a source of information, advice and encouragement for the Instagram's fitness community (also known as FT). Generally, this type of influencers provides information or advice regarding workouts, healthy eating, and healthy lifestyle, through images of toned bodies with inspirational quotes, and "before-and-after" stories (Carrotte et al., 2015). FT is usually criticized for promoting excessive and compulsive exercise, for focusing on appearance rather than health and fitness and for encouraging the athletic body shape (Carrotte et al., 2015). Chou and Edge (2012) stated that the exposure to images of celebrities and strangers makes people more vulnerable to self- judgment and negative social comparisons because this exposure can make others assume that what is in the picture is the way others live. Additionally, several health professionals working with individuals with ON tendencies state that clients often prefer to follow the advice of SM influencers rather than follow the personalized treatment plan suggested by the health professional (Cheshire et al., 2020). Hence, we would offer the following:

H2a: Exposure to fitness content on Instagram (FT) can increase BD.
H2b: BD mediates the relationship between FT and ON.

2.5 Sociocultural risk factors

Athletic-ideal internalization

Thompson & Heinberg (1999) acknowledge that although the exposure to beauty ideals has been shown to have detrimental consequences, however, IN of these ideals has been also a risk factor for the development of eating disorders or compulsive exercise. The authors define IN as the "endorsement or acceptance of media and societally-based pressures regarding appearance" (p. 342). Magazines have subjected individuals to overly thin models in the past, making individuals internalize the thin-ideal. SM, however, has been "promoting" the athletic ideal through movements such as FT, allowing IN of the thin-ideal to be replaced by IN of this new and emerging ideal. The attractiveness is now in a body

that is fit and toned, rather than incredibly thin. Previous studies have found that IN of the athletic ideal increases compulsive exercise (Bell et al., 2016; Homan, 2010) and disordered eating (Bell et al., 2016). Based on that, the following hypotheses are proposed:

H3a: IN of the athletic ideal increases BD.
H3b: BD mediates the relationship between IN of the athletic ideal and ON.

Social Comparisons

SM is a place for social comparisons because of its scope and speed in liking its users (Tiggemann & Zaccardo, 2015) and transmitting the ideals of beauty (Tiggemann & McGill, 2004). Through *Social Comparison Theory*, Festinger (1954) acknowledges that women measure themselves according to the standards of appearance to which they are subjected in the media. The author also distinguishes two types of social comparisons – when people compare themselves to others who are better than them (UP) and when people compare themselves to others who are worse than them (DO).

The appearance-based comparisons are typically UP, and negative outcomes, such as negative mood and BD, are often linked to this social comparison (Perloff, 2014; Shaw & Waller, 1995;). Tiggemann and Zaccardo (2015) indicate these effects are more significant in image-focused SM, and state that "Fitinpiration" does not promote a model body shape, i.e., a very thin body, but instead promotes an athletic body shape that remains thin but is also fit and strong. Thus, it promotes a body shape that is difficult to achieve by an average person, causing UP and resulting in the negative outcomes. Conversely, if people are more prompted to make DO the outcomes become positive (Tiggemann & Polivy, 2010). Previous studies suggest that DO usually produces improved mood and enhanced self-esteem (Fardouly et al., 2017; Perloff, 2014; Shaw & Waller, 1995; Tiggemann & McGill, 2004). However, few studies have looked at the impact of this sort of comparison on the development of BD and eating disorders.

Martin & Kennedy (1994), on the other hand, looked into the impact of social comparison motives (self-improvement and self-evaluation) and their differing effects on self-perceptions of physical attractiveness. As a result, the effect of UP and DO social comparisons on BD may not be as straightforward as previously thought, because the motivation for making UP and/or DO may change the supposed negative and/or positive effects advocated by the literature (Fardouly et al., 2017; Perloff, 2014; Shaw & Waller, 1995). Hence, we propose:

H4a1: UP result in increased BD.
H4a2: BD mediates the relationship between UP and ON.
H4b1: DO result in increased BD.
H4b2: BD mediates the relationship between DO and ON.

2.6 Personal predisposing risk factors

When exposed to the same content on SM, people respond in various ways, as not all are equally susceptible or vulnerable to the SM's adverse effects. ON can be triggered by exposure to images of targets with salient features on SM, by individual motivation to internalize beauty ideals and make social comparisons. However, there are characteristics of the individual personality that make one more willing to develop this pathology.

Perfectionist personality traits

PF is defined by Barnes and Caltabiano (2017, p. 178) as "a personality trait typified by setting of excessively high standards, expectations of flawlessness, and excessive criticism of self and others". This personality trait is characterized by the intention to reach perfection, so it can encourage a persistent search for the beauty ideals, and consequently constitute a risk factor for the development of eating disorders (Bruch, 1973). The quest for the "perfect" diet and optimum health is a key feature of ON and this trait parallels the key attribute of the perfectionist personality – the search for perfection – the past literature suggests that ON is associated with the perfectionist personality (Koven & Wabry, 2015). The devotion to a strict diet can be a manifestation of the individual's PF towards food (Barnes & Caltabiano, 2017).

As in Anorexia Nervosa (AN) and Obsessive-Compulsive Disorder (OCD), ON is associated with a perfectionist personality (Koven & Wabry, 2015). Some studies claim the existence of a positive correlation between ON symptoms and PF, suggesting that PF could constitute a risk factor for the development of this eating pathology (Barnes & Caltabiano, 2017; Oberle et al., 2017). However, there are still few studies that focus on this relationship. Hence, we would like to propose:

H5a: Perfectionist personality increases BD.
H5b: BD mediates the relationship between perfectionist personality and ON.

Obsessive-compulsive personality traits

Individuals with ON attach too much importance to the quality of the food they eat, analyzing thoroughly whether the food is pure and natural. They spend a considerable amount of time thinking and analyzing their diet, spending much of their time looking for new healthy food products and preparing them according to the technique they perceived the healthier, ritualizing preparation patterns (Olejniczak et al., 2017). O rthorexic behavior shares common features with OC behavior, realizing that individuals with ON may have certain OC tendencies.

OC symptoms seem to be related to the development of ON (McComb & Mills, 2019). Obsessive and ritualized behaviors in relation to healthy eating and exercise were found to be associated with greater tendencies of ON among Italian athletes (Segura-García et al., 2012). It was also found that obsession and compulsion with exercise were associated with an increased obsession with healthy eating among American students (Oberle et al., 2018). Other studies have analyzed the association between ON and OC behavior, not limiting the latter to eating and exercise, but including washing compulsions, contamination obsession, methodical organization, excessive rituals and/or superstitions, among others. They realized that these were all associated with the development of ON among a Turkish sample (Çiçekoğlu & Tunçay, 2018) and a sample of students from a Spanish university (Barrada & Roncero, 2018). Yet, Brytek-Matera et al. (2017) found that there is no association between OC behavior and tendency to develop ON among a female sample of Italian college students. They also stated that ON should not be considered as a subset of OC disorder (Brytek-Matera et al., 2017). Hence, we propose:

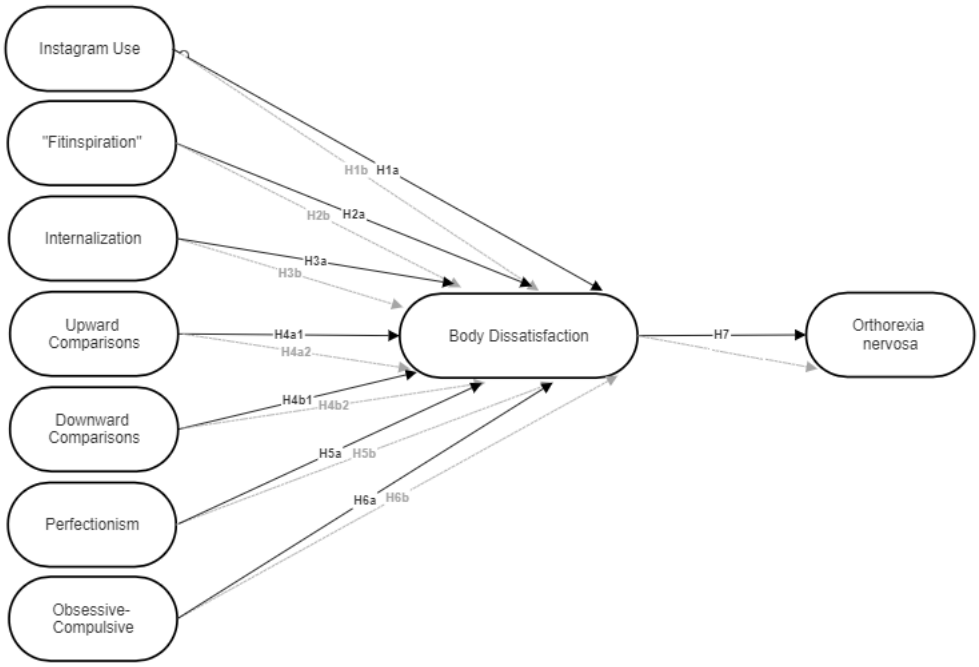
H6a: OC behaviors can lead to a rise on BD.
H6b: BD mediates the relationship between OC and ON.

Finally, as discussed before, several studies consider that individuals with ON are also concerned with the appearance, shape and size of their body, that is, while they want to be healthier, they also want to improve their body image (Almeida et al., 2018; Barthels et al., 2020; Parra-Fernández et al., 2018). Parra-Fernandez et al. (2018) found a positive correlation between ON and BD. In a Portuguese exercising group those who had more tendency to develop ON were also more likely to be unhappy with their appearance and body image (Almeida et al., 2018). We build on the above discussion to acknowledge the effect of BD on ON.

H7: BD can contribute to increased ON symptoms.

Figure 1 sums up the proposed direct (straight line) and mediating hypotheses (dotted line). Our research model builds on an expended sociocultural approach in order to study not only the sociocultural factors but also the personal factors effects (IU, FT, IN, UP, DO, PF, OC) on BD and ON. Moreover, to explain the mediating role of BD.

Figure 1. Proposed research model



3. Method

3.1. Data collection and scales

In order to test the proposed model above, a survey was developed and distributed online, through SM, using the snowball sampling technique. The questionnaire was divided into nine sections. Table 1 presents the source of each scale. Finally, respondents were asked to report the demographic data of gender, age and country of origin. It is worth mentioning that two "attention check" questions were

added at 20% and 80% of the survey to identify potential outliers and to measure the respondents' attention. Finally, to avoid missing values, all questions were mandatory.

Table 1. Scales

Variable	Scale	Adapted from
IU	Instagram use	(Vacas de Carvalho et al., 2020)
FT	Fitinspiration	(Ooms, 2019; Tiggemann & Zaccardo, 2015)
IN	Sociocultural Attitudes Towards Appearance	(Schaefer & Thompson, 2014)
UP	Upward physical appearance comparison	(O'Brien et al., 2009)
DO	Downward physical appearance comparison	(O'Brien et al., 2009)
PF	Short form of the Multidimension PF scale	(Hewitt & Flett, 1991)
OC	OC inventory (short version)	(Foa et al., 2002)
BD	Body Shape questionnaire (short version)	(Dowson & Henderson, 2001)
ON	ORTO-15	(Donini et al., 2005)

3.2. Data Treatment

Data cleaning process was carried out prior to beginning of data analysis in order to ensure that the data is correct, consistent, and usable. The initial number of responses was 498, however, by using a filter question at the beginning of our survey, 128 responses were unqualified to complete the questionnaire for being non-Instagram users, and respondents who answered at least one of the two "attention check" questions incorrectly were also identified as outliers. Based on that, another 132 responses were removed from the final sample. To test the proposed model, the data obtained was analyzed using sing *SmartPLS*. Structural Equation Modelling (SEM) was used to test the proposed hypotheses.

3.3. Evaluation of Measurement Indicators

Variance Inflation Factor (VIF) was used to determine whether collinearity (or multicollinearity) exists. Based on VIF, we found that some indicators have collinearity issues, the indicators with the highest VIF within each scale were excluded. Based on that, three items from UP, two from IN and one from DO were removed leading to no more presentation of collinearity issues.

Reliability was measured using Cronbach's Alpha and Composite reliability. Except for IU, Cronbach's Alpha values ranged from 0.851 to 0.958 exceeding the cut-off of 0.7 recommended by Hair et al. (2017), the same applies for composite reliability values which ranged from 0.759 to 0.968. Regarding IU, we can conclude that there were no reliability issues. Composite reliability value is greater than 0.7, indicating the scale's internal consistency will fall somewhere between 0.530 and 0.759.

Table 2. Reliability analysis

	Cronbach's Alpha	Composite Reliability
IU	**0,530**	0,759
FT	0,856	0,892
IN	0,894	0,907
DO	0,958	0,965
UP	0,962	0,968
PF	0,896	0,907
OC	0,925	0,933
BD	0,935	0,943
ON	0,851	0,879

Significance and Relevance

To assess indicator's contribution the outer weight criterion was examined. The bootstrapping process was used to confirm if the outer weights in the measurement model were significantly different from zero (Hair et al., 2017). Some outer weights were not significant, implying that the indicator has no relative contribution to the construct. However, the larger number of indicators in this study may explain the presence of multiple non-significant outer weights (Hair et al., 2017). The presence of non-significant outer weights should not be interpreted as a sign of poor measurement model quality. When there are non-significant outer weights, it is also crucial to evaluate the absolute contribution of indicators to the construct, that is, the information that an indicator gives without considering any other indicators (Hair et al., 2017). Nevertheless, in presence of non-significant outer weights, it is crucial to evaluate the outer loadings. Most of the indicators have an absolute contribution, but one item of ON and two of PF indicated non-significant outer loadings. Thus, it was excluded from the study.

Sample characteristics

The study final sample consisted of 238 respondents, 138 of whom were Portuguese and 100 Brazilian. Around 64% of the sample were female, the Portuguese sample is largely made up of respondents age between 18 and 35 (75% of the Portuguese sample), whereas the Brazilian sample mostly include respondents age between from 25 to 50 (62% of the Brazilian sample).

4. Data analysis

The results obtained for the overall sample showed statistical significance, except for IU→BD (β= 0,028; t= 0,520; p-value= 0,603), FT→BD (β= -0,049; t= 0,843; p-value= 0,400) and OC→BD (β= 0,079; t= 1,491; p- value= 0,137). Thus, hypotheses H3a, H4a1, H4b1, H5a and H7 were accepted, while hypotheses H1a and H6a are rejected.

For the complete sample (N = 238) R^2 is 0,591 and 0,616 for BD and ON, respectively, that is, the model explains 59,1% of the variation in BD and 61,6% of the variation in ON. Since R^2 values are relatively high (Falk & Miller, 1992), it is possible to state that the model has high predictive power.

The mechanisms that underlie the cause-effect relationship between the antecedents and the outcomes can be corroborated by analyzing the strength of the mediator variable's correlation with the other constructs (Hair et al., 2017). Based on that, BD was a significant mediator in the relationship between IN and ON (β= 0,318; t = 5,632; *p-value*< 0,001); UP and ON (β= 0,138; t = 2,517; *p-value*= 0,012), DO and ON (β= 0,191; t = 3,802; *p-value*< 0,001); and PF and ON (β= 0,090; t = 2,460; *p-value*= 0,014).

As proposed by Fardouly et al. (2018), it may not be the length of exposure to Instagram and to FT that increases the likelihood of developing ON, but rather the characteristics of this SM and this type of content that seems to contribute to IN, DO, and UP. In this regard, the link between IU and ON mediated via IN, DO, UP and BD was evaluated. Table 3, lead to the conclusion that IU mediated via IN, DO and UP has a significant impact on BD and ON. Additionally, according to Table 4 and 5, FT content alone does not contribute to the development of ON, but exposure FT mediated by IN, DO and UP contributes to the increase of BD and ON. Thus, the usage of Instagram, as well as the pressure imposed by health and fitness- related content, contributes to the IN, DO and UP, which can lead to greater BD and, as a result, the development of eating disorders such as ON. Table 6 summarizes the results about the proposed hypotheses.

Table 4. The impact of IU on IN, as well as the tendency to perform social comparisons (DO and UP) and, as a result, the impact on the development of BD and ON.

	Complete sample			
	Coefficient (β)	**t value**	**p value**	**Significance**
IU→UP→BD	0,086	2,333	0,020	Significant
IU→DO→BD→ON	0,041	2,041	0,042	Significant
DO→BD→ON	0,180	2,925	0,004	Significant
IN→BD→ON	0,383	4,987	0,000	Significant
UP→BD→ON	0,196	2,736	0,006	Significant
IU→DO→BD	0,049	2,118	0,035	Significant
IU→UP→BD→ON	0,071	2,303	0,022	Significant
IU→IN→BD	0,194	4,491	0,000	Significant
IU→IN→BD→ON	0,159	4,222	0,000	Significant

Table 5. The impact of the exposure to health and fitness-related content on internalizing the athletic beauty ideal, as well as the tendency to perform social comparisons (DO and UP) and, as a result, the impact on the development of BD and ON

	Complete sample			
	Coefficient (β)	**t value**	**p value**	**Significance**
FT→IN→BD→ON	0,198	4,260	0,000	Significant
FT→IN→BD	0,242	4,504	0,000	Significant
FT→UP→BD	0,125	2,422	0,016	Significant
DO→BD→ON	0,210	3,162	0,002	Significant
IN→BD→ON	0,360	4,426	0,000	Significant
FT→DO→BD→ON	0,049	2,340	0,020	Significant

UP→BD→ON	0,190	2,534	0,012	Significant
FT→DO→BD	0,059	2,425	0,016	Significant
FT→UP→BD→ON	0,102	2,373	0,018	Significant

Table 6.

Hypothesis number	Hypothesis	Result
H1a	Instagram's use increases BD.	NS
H1b	BD mediates the relationship between Instagram's use and ON.	S
H2a	Exposure to fitness content on Instagram (FT) can increase BD.	NS
H2b	BD mediates the relationship between FT and ON.	S
H3a	IN of the athletic ideal increases BD.	S
H3b	BD mediates the relationship between IN of the athletic ideal and ON.	S
H4a1	UP result in increased BD.	S
H4a2	BD mediates the relationship between UP and ON.	S
H4b1	DO result in increased BD.	S
H4b2	BD mediates the relationship between DO and ON.	S
H5a	Perfectionist personality increases BD.	S
H5b	BD mediates the relationship between perfectionist personality and ON.	S
H6a	OC behaviors can lead to a rise on BD.	NS
H6b	BD mediates the relationship between OC and ON.	S
H7	BD can contribute to increased ON symptoms.	S

S = hypothesis is supported / NS = hypothesis is not supported

5. Discussion and conclusion

In this paper, we studied the effect of IU, FT, IN, DO, UP, PF, and OC on BD and ON via BD. The findings demonstrate that IU has no significant direct effect on BD and ON, thus the time spent on Instagram is not related directly to increase symptoms of ON and BD. These findings contrast with those of Turner and Lefevre (2017), who found that more Instagram usage was linked to a higher likelihood of developing ON. However, our study reveal that IU influence BD and ON when considering the mediating role of several variables such as UP, DO and IN, hence, the current paper explain the nature of the effect of IU and what paths this use follow to influence BD and ON. Moreover, FT showed statistical insignificant effect on BD and ON development, which is not in line with what was proposed by McComb and Mills (2019) and Rounsefell et al. (2020). While IU and FT did not lead to increased BD, as initially was proposed (H1a, H2a), these constructs lead to increase IN of athletic ideal and social comparisons (both UP and DO). These variables, in turn, have been linked to an increase in BD and, as a result, increased ON symptoms. These findings are in line with The *Sociocultural Theory* of Thompson and Heinberg (1999) which acknowledge that individuals' behaviors are largely affected by the social interaction. Both Bell et al. (2016) and Homan (2010) stated that athletic ideal's IN increases compulsive exercise and disordered eating, but does not seem to increase BD, unlike thin ideal's internalization. The findings of this research reveal that IN influence BD. Therefore, the findings are consistent with the conclusions reached by the aforementioned authors, namely about the effect of IN on the development of eating disorders, in this case ON. The same cannot be said for the link between IN and BD, where the findings contradict the conclusions of the aforementioned researchers.

In line with previous studies (Fardouly et al., 2017; Perloff, 2014; Shaw & Waller, 1995; Tiggemann & McGill, 2004; Tiggemann & Polivy, 2010), social comparisons in general showed a small to moderate effect on BD. It is worth emphasizing that social comparisons can be either UP or DO, and the current study, unlike previous studies (Fardouly et al., 2017; Tiggemann & McGill, 2004), examines the influence of both separately. The findings indicate that both had a significant impact on BD development. Like Martin and Kennedy (1994) did, instead of only focusing on the type of social comparison (DO, UP) it should be considering the impact of the motivations, for example self-evaluation and self-improvement, that drive a person to perform DO and/or UP that may contribute to a poor self-perception about their body.

Previous studies suggest PF personality trait might inspire a constant search for beauty ideals, which can lead to BD and, as a result, can become a risk factor for the development of eating disorders (Bardone-Cone et al., 2007; Bruch, 1973; Koven & Wabry, 2015). In the specific case of the relationship between PF and ON, previous research has found that this personality trait constitutes a risk factor for the development of this eating pathology, meaning that perfectionists are more likely to develop ON. The results of the present study in the complete sample (N = 238) correspond with previous research and literature, indicating that PF is a risk factor for the development of BD and ON.

Orthorexic people´s actions are similar to some OC characteristics. In this regard, McComb and Mills (2019) suggest that OC symptoms are linked to the development of ON. There are several studies that look at this issue; some focus on the association between OC behaviors related to healthy eating and exercise (Oberle et al., 2018; Segura-García et al., 2012), while others look at the relationship between ON and OC behaviors of various natures (Barrada & Roncero, 2018; Brytek-Matera et al., 2017; Çiçekoğlu & Tunçay, 2018). The current study examines the impact of people who have a proclivity for OC behaviors of various types on the development of BD and ON. OC exhibited statistical significance in the development of BD and mediated by BD, in the increase of ON tendencies. These findings support earlier research (Barrada & Roncero, 2018; Çiçekoğlu & Tunçay, 2018; Oberle et al., 2018; Segura-García et al., 2012) that suggests that OC are a risk factor for the development of ON.

Bratman and Knight (2000) document orthorexic individuals are more concerned with the quality of their diet than with the appearance of their bodies and losing weight. However, Bratman (2016) acknowledge that many people believe that being healthy means having a thin body with low fat mass index. In this regard, the current research investigates the link between BD and ON, as well as the role of BD as a mediator in the development of ON. The results indicate that BD has statistical significance on ON, i.e., a greater BD increased the likelihood of ON. As a result, and in line with (Almeida et al., 2018; Barnes & Caltabiano, 2017; Barthels et al., 2020; Brytek-Matera et al., 2016; Parra-Fernández et al., 2018), orthorexic people seek to improve the physical appearance in addition to achieving complete health. The current findings are consistent with those found by Parra-Fernández et al. (2018) in a sample of Spanish students as well as those obtained by Almeida et al. (2018) in a sample of Portuguese sports and fitness professionals.

5.1. Theoretical contribution

The current study shows how content shared on Instagram by fitness influencers, fitness clothing, healthy eating, and dietary supplementation-related brands follows the Sociocultural Theory considering the sample under investigation, cause users to internalize the athletic ideal, make them more vulnerable to social comparisons of physical appearance, and thus make them feel more dissatisfied with their body and consequently develop ON. In addition to sociocultural influences, the current study finds that those with a perfectionist disposition are more vulnerable to these harmful consequences of SM and individuals prone to OC behaviors become more susceptible to develop BD and ON. In sum, the current study contributes to the literature on revealing the direct effect of DO, IN and UP on BD, and the indirect effect of all antecedents on ON when considering the mediating role of BD.

5.2. Managerial implications

Instagram pages of fitness clothing brands like *Oysho* and *GymShark*, as well as brands of healthy products or food supplementation like *Prozis* and *MyProtein* obviously use a lot of images related to physical appearance, i.e., images that convey the athletic ideal. The same applies for the content published by personal trainers who are attempting to market their brand and training programs. According to Ki et al. (2020), SM users have a desire for ideality, and this desire is satisfied when people view an influencer to be inspirational. Kayla Itsines, Pamela Rief and Simeon Panda are three of the most globally well-known fitness influencers and are examples of using their Instagram profiles to showcase the ideal of an athletic body, in addition they provide recommendations on how to be healthy and share healthy food recipes. In this regard, these types of influencers or brands benefit from them must consider the type of message they want to share when posting on SM, they should understand that what they post might have negative effects on many of their followers, leading to serious mental and physical health issues. Hence, in order to disassociate themselves from such negative repercussions that could tarnish the brand's image, they must employ a variety of pictures to dispel the notion that the athletic body is the one that reveals "being healthy", because "being healthy" is not linked to a body type, but refers to a complete condition of physical, mental and social health, they also should avoid promoting strict training and nutrition regimens and should share more formed information. In other words, there is a need for more differentiation in the SMM employed by fitness, healthy food, supplements, and personal trainers' brands. These brands must examine their SMM tactics, paying particular attention to the fact that SM reaches a larger number of individuals, and that each person has unique personal qualities that determine how they are influenced by shared material. In this study, antecedents including negative social comparison, FT, and IN impact on BD, SM platforms and SMM should consider mitigating the negative effect of these variables, and also looking for what enhance body satisfaction in a natural way to focus on it and consider it when building marketing strategies.

Because the fitness community's content may lead people with perfectionist personalities to seek out the "perfect body" and develop rigid and sometimes ritualized behaviors around healthy eating and physical activity, it's critical that governmental organizations and medical authorities use SM to spread the message that there is no such thing as a "perfect body" and that people don't have to ritualize or strict

their consumption patterns and that it is important to have a varied diet. When it comes to exercise, reiterate that there is a special sort of training for each individual's demands, and that in most circumstances "less is more". For example, healthy food brands, instead of focusing on how their food improve the body looking, it is better and more ethical to focus on the consumer feelings that could be improved by consuming the brand products (e.g., an influencer could say “eating this food makes me feel healthier”, or “I feel fresh and energic when eating this food”, etc.). Another example is that a clothing brand could advertise clothes by “normal and non-perfectionist influencers”.

6. Research limitations and future directions

The present study has limitations some of which indicate future research opportunities. First, the questionnaire was long to some extent and probably resulted in a high number of dropouts and relatively small sample size. Second, the use of SM and its effect on BD and the development of food disorders such as ON may differ based on age, gender, or other demographics. Hence, understanding the moderating role played by these demographics may provide also venues for future research. Although generations X, Y and Z have all adapted to technology, their methods of use differ. Future research should also look into the motivations that lead someone to conduct a social comparison and whether these motivations determine the sort of repercussions of social comparisons or whether they are solely dependent on the type of comparison made. Additionally, it is also crucial to look at additional individual and behavioral traits to better understand how or who is more susceptible to being influenced by SM and, as a result, to developing ON or other eating and mental illnesses.

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