Bachelor Thesis

The relationship between Social Network Sites, Drive for Thinness and Orthorexia Nervosa among University Students: A Mediation Analysis

Julia Fleischmann

s2280884

Faculty of Behavioural, Management & Social Sciences, University of Twente

Positive Clinical Psychology & Technology

1st Supervisor: Alexandra Ghita

2nd Supervisor: Karla Duarte

June 2022

Table of Contents

Abstract **3**

The relationship between Social Network Sites, Drive for Thinness and Orthorexia Nervosa among University Students: A Mediation Analysis **4**

Drive for Thinness 6

Social Network Sites 7

The Current Study 8

Methods **9**

Design 9

Participants 9

Materials 10

Socio-demographic data 10

Questions Related to SNSs 10

Orthorexia-Related Concerns 10

Drive for Thinness-Related Concerns 11

Procedure 11

Statistical Analysis 12

Results **12**

Descriptive Statistics 12

Inferential Statistics 14

Discussion **15**

Interpretation of Results 15

The Mediation Model 16

The Direct Effect 16

The Indirect Effect 17

Implications For Further Research 19

Conclusion 20

References **21**

Appendix A **31**

Appendix B **36**

Abstract

Object. The aim of the current study was to research if spending time on Social Network Sites (SNSs) mediates the relationship between drive for thinness (DT) and orthorexia nervosa (ON). **Background.** ON appeared recently in literature as a new mental health concern, dealing with an obsession to eat healthy food. An indication of developing ON might be to show tendencies of DT. Furthermore, previous literature stated that the emergence of ON and DT is influenced by spending time on SNSs. However, inconsistent literature about the link between ON and DT was found. Therefore, it remains unclear how DT and ON are correlated. The current study is important to clarify the link between DT and ON by considering the mediating role of SNSs. **Methods.** The analysis was conducted with 242 university students among whom 185 participants identified as female. The study was conducted with a cross-sectional online survey in which questions about socio-demographic data and the time spent on SNSs were asked. ON tendencies were measured with the Düsseldorf Orthorexia Scale (DOS). DT was assessed with the DT subscale of the Eating Disorder Inventory (EDI-2). A mediation analysis was conducted with the SPSS software tool PROCESS Macro. **Results.** The mediation model revealed a positive significant relationship between DT and ON, and a negative significant relationship between time spent on SNSs and ON. No significant correlation was found between DT and time spent on SNSs. However, it was found that time spent on SNSs mediates the correlation between DT and ON. The significant mediation effect is negative. **Conclusion.** The current study extended the previous literature by conducting a mediation model with time spent on SNS, ON, and DT among university students. It was found that time spent on SNSs mediates the relationship between DT and ON. In addition, possessing ON tendencies implies showing more often high DT symptoms than low DT symptoms**.** Furthermore, it is suggested that spending more time on SNSs comes with a lower risk of developing ON.

Keywords: orthorexia nervosa, drive for thinness, Social Network Sites

The relationship between Social Network Sites, Drive for Thinness and Orthorexia Nervosa among University Students: A Mediation Analysis

In the United States, 97% of adults believe healthy eating habits are very important for living a healthy life (Funk & Kennedy, 2016). This exemplary belief is held due to the currently dominant opinion that living a healthy lifestyle should be one of the main goals to achieve since it is associated with well-being. In order to realise society's idealisation of living a healthy lifestyle, a healthy diet should be followed (Ross Arguedas, 2020). However, it was observed that the initial fascination for healthy eating might develop into an obsessional adherence to a clean, pure, and healthy diet, which has been termed ON.

Displaying orthorexic-related symptoms implies suffering due to two reasons (Nevin & Vartanian, 2017). First, it may lead to nutrient deficiencies, poor physical health, and social isolation (Koven & Abry, 2015). Second, the obsession with healthy eating is socially acceptable and consequently, the pathological eating behaviour remains unnoticed by many people (Hanganu-Bresch, 2019). Thus, many individuals suffering from orthorexic-related symptoms do not receive any treatment (Greville-Harris et al., 2019).

Another important phenomenon in this context is the DT. To put it briefly, DT can be conceptualised as having a desire for a thin body shape. This is worth mentioning because several studies found a correlation between DT and ON, which might facilitate the recognition of ON (Barthels et al., 2020; Domingues & Carmo, 2020). Furthermore, ON as well as DT tendencies are shown more frequently in popular healthy eating communities on SNSs (Håman et al., 2015). Based on these findings, the current study aims to provide deeper insights into the correlations between ON, DT, and time spent on SNSs.

Orthorexia Nervosa

ON is present in individuals when they are pathologically obsessed with eating healthy foods to avoid severe diseases (Bóna et al., 2018). ON is perceived to develop into two stages. The first stage can be described as a fascination for diet and health and the second stage is the emergence of an obsession with this healthy food (Douma et al., 2021). The desire to eat healthy foods is not itself harmful, but the obsession with these foods might be due to malnutrition for example (Donini et al., 2004).

The development of ON in these two stages is noticeable by displaying certain orthorexic-related symptoms. One ON symptom is to eat "clean". "Clean" eating refers to eating behaviours that are focused on "proper" nutrition, restrictive eating patterns, and avoidance of foods, considered to be impure (Nevin & Vartanian, 2017). "Proper" nutrition is defined as consuming sufficient fruits, vegetables, and whole grains while considering a limited

consumption of sugars, unsaturated fats, and salt per day (World Health Organization, 2020). Categorizing the food as proper or improper is another orthorexic-related symptom. It is done by investigating for example if any micronutrients or preservatives were used while producing the food (Koven & Abry, 2015). Additionally, improper food can be identified by spending extra time weighing and measuring the food. Next, certain underlying feelings can be classified as symptoms for ON as well. For example, after consuming unhealthy or "improper" foods, individuals often experience guilt because they are concerned about the effect of "improper" food on physical and mental health (Koven & Abry, 2015). On top of that, individuals with ON tendencies feel intense frustration when their food-related practices are disrupted (Koven & Abry, 2015). Besides these underlying feelings, they typically exhibit erroneous food beliefs. For instance, individuals displaying orthorexic-related symptoms believe particular foods to be associated with one's blood type. By consuming these foods, they think that diseases are prevented, and energy and well-being are enhanced (Koven & Abry, 2015).

These symptoms, whether appearing in form of behaviour, feelings, or beliefs are displayed by approximately 7% of the general population, while other researchers found a much higher prevalence among selected groups (Hanganu-Bresch, 2019). The prevalence seems to be higher in individuals with health-related occupations, such as yoga practitioners (86%) or athletes (58%) (Domingues & Carmo, 2020; Varga et al., 2013). Another high-risk group is university students, among which Dell'Osso et al. (2017) measured a prevalence of 34,9%. The fact that they undergo a critical period in their lives because they need to take responsibility for their own dietary habits may explain the higher prevalence. Besides that, they explore their attitude toward health beliefs which is impeded by being regularly exposed to content on SNSs, idealising a healthy lifestyle (Parra-Fernández et al., 2018).

Nevertheless, having health-related occupations or starting to take more responsibility for one's own diet as a university student, are not the only factors associated with ON. A correlational analysis by Barnes and Caltabiano (2016) found that perfectionism is correlated with ON tendencies as well. Perfectionism manifests itself in adhering to strict dietary rules, which is one of the symptoms of ON. Additionally, DT is correlated with ON. Madden and Chamberlain (2004) argue that a thin body can be seen as an outward sign of having achieved society's ideal of living a healthy lifestyle. However, research is inconsistent regarding the correlational character of DT on ON. Various case reports mentioned that individuals with ON tendencies are not concerned about weight gain and thus, the desire for thinness is not considered a motivation for ON (Depa et al., 2019; Domingues & Carmo, 2020). Therefore, it remains unclear how DT and ON are correlated.

Drive for Thinness

DT is defined as a desire for a thinner body shape. However, according to Peñas-Lledó et al. (2015), DT can be distinguished from an extreme fear of fat. Levitt (2003) proposes that DT and fear of fat are based on different underlying motivational orientations. DT is associated with the approach motivation, which is defined as a behaviour, striving toward positive stimuli such as thin bodies. Meanwhile, fear of fat is driven by an avoidance motivation, defined as the attempt to withdraw from negative stimuli, for instance, non-thin bodies (Dondzilo et al., 2018). It is crucial to note that DT is a mental health condition that is often experienced by people, classified as overweight according to the BMI calculations (Laraia et al., 2021; World Health Organization, 2010).

Since thinness is associated with positive character attributes and overweight with negative character attributes, the thin prototype is approached, and the fat prototype is avoided (Dondzilo et al., 2018). The reason for associating positive attributes with thinness and negative attributes with being fat lies in socio-cultural attitudes. In Western societies, thinness is idealised. On the one hand, the attitude is held that thinness is the ideal beauty standard. To be thin means to be attractive (Levitt, 2003). On the other hand, thinness is idealised since it is seen as an outward sign of living a healthy lifestyle which is also socially desired (Håman et al., 2015). Especially women are more affected by the thinness ideal, while men tend to prefer a muscular body shape (Pingitore et al., 1997).

Internalising the thinness ideal and engaging in social comparisons represent the two main mechanisms in the emergence of DT. They can be experienced at the same time or independently from each other. Firstly, the internalization refers to the extent to which individuals endorse societally defined ideals as personally meaningful beliefs and goals. Consequently, individuals engage in behaviours, aiming to get closer to these ideals. It is important to emphasize that although most people are aware of the thinness ideal, not everyone internalises the ideal to the same degree. However, the people who internalised it are at greater risk to develop DT (Fardouly et al., 2017; Thompson & Stice, 2001). Secondly, Jiotsa et al. (2021) found in their study that participants who often compared their physical appearance to idealised bodies had a higher DT than those who compared themselves less often. Comparing one's own body to idealised thin bodies triggers a discrepancy between the perception of one's actual body image and the ideal body image (Sands, 2000). The gap between both states prompts discomfort and the motivation to engage in behaviours, in which individuals strive for a thinner body. This striving for a thinner body is described as DT. Examples of such behaviours are designing diet plans, eliminating specific food, and eating in a restrictive way

(Dalley & Buunk, 2009). These behaviour patterns are intensified by looking at content on SNSs, idealising thin bodies. Based on this content, SNSs offer up a perfect platform for social comparisons to take place (Vogel et al., 2015). Comparing one's own body to a thin body, represented frequently on SNSs increases the discrepancy between actual body image and ideal body image and thus, enhances the feeling of discomfort (Jiotsa et al., 2021).

Social Network Sites

The term SNSs refers to every website and online-mobile app with user-generated content. User-generated content means that the users can actively decide how they participate in SNSs, e.g., they can share photos, videos, or daily news (Holland & Tiggemann, 2016). For example, on the SNS Instagram, more than 100 million photos and videos are uploaded each day which are posted or seen by approximately 400 million active users (Fardouly et al., 2017; Wiederhold, 2019). Particularly, young adults between the ages of 18 and 29 are identified as the most frequent SNS users (Turner & Lefevre, 2017), as it functions as their main communication tool (Al Rahmi & Othman, 2013).

Spending time on SNSs can lead to the development of depressive symptoms, reduced self-esteem, and body dissatisfaction (Sharma et al., 2020). Body dissatisfaction is explained by the theoretical framework of the tripartite model of body image (You & Shin, 2020). In this model, it is proposed that three types of social pressure (peers, parents, and SNSs) lead to body dissatisfaction. However, by evaluating the model it was found that SNSs have the greatest influence on people's body image (You & Shin, 2020). Several studies analysed the model and found that SNSs usage may lead to body dissatisfaction through two pathways, namely thin-ideal internalisation and social comparison. Those pathways were integrated into the model to explain the influence of SNSs on body dissatisfaction better (Yamamiya et al., 2008). The pathways are significant in the emergence of DT as well. With having internalised the thinness ideal, individuals might edit their images on SNSs according to the ideal body shape before posting. Consequently, the idealised nature of these images makes appearance comparisons more likely for other users. The millions of images, uploaded daily on SNSs provide the users with regular opportunities to perceive a discrepancy between their own bodies and the idealised thin bodies on these images. Individuals with DT tendencies try to overcome this discrepancy in order to be thin as the people on the images on SNSs (Sands, 2000). Unlike traditional media that predominantly show images of models or celebrities, SNSs such as Instagram display images of a variety of different comparison targets (e.g. friends, family, acquaintances, strangers). Research demonstrates that SNSs users compare their appearance more often to

images of peers, and acquaintances than to celebrities (Fardouly et al., 2017). Since SNSs facilitate the internalisation of thinness ideal and appearance comparisons, DT is reinforced by time spent on SNSs.

Previous literature suggests that SNS users are not only comparing their body to an idealised thin body but also comparing their own diet with a socially desired healthy diet. The idealization of a healthy diet is represented in a recently growing trend on SNSs, called 'Fitspiration" (Turner & Lefevre, 2017). The underlying intention of this movement is to inspire its followers in eating pure food and exercising physically. Despite the good intention of supporting people in achieving a healthy lifestyle, it might trigger ON. An exploratory analysis of the healthy eating community on the SNS Instagram revealed that higher Instagram engagement with healthy posts is correlated with greater ON tendencies (Woodley, 2018). Overall, time spent on SNSs has an influence on the internalization of the thinness ideal as well as of the healthy eating ideal and thus may influence the relationship between DT and ON.

The Current Study

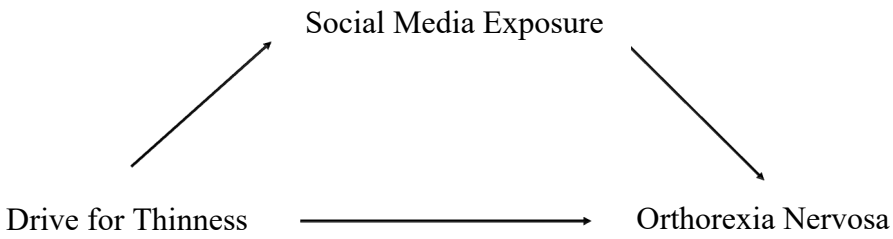
To shed light on the inconsistent results of previous studies about the correlation between DT and ON, the current study examines this relationship in more depth. This is fundamental since ON is socially accepted although it was previously stated that it might lead to severe consequences. As research demonstrates, SNSs play a significant role in the emergence of DT and ON. Thus, SNSs are included in the study. Especially, time spent on SNSs mediating the link between DT and ON has not been tested yet. University students are a potential target group due to their high SNS use and their tendency to explore their body image. Therefore, university students are used as the target group.

The present study aims to investigate if time spent on SNSs mediates the relationship between DT and ON among university students. Thereby an existing gap in the literature is addressed and it is reacted to the needs of university students, who are particularly at risk. To fulfill the current study's aim, the following research question was developed:

RQ: To what extent does the time spent on social network sites mediate the relationship between drive for thinness and orthorexia nervosa among university students?

Figure 1

Visualization of the Research Question



Methods

Design

A quantitative non-experimental research design was employed. By using the methodology of convenience sampling, a cross-sectional online survey was publicised. The survey researched the correlation between the independent variable of DT and the dependent variable of ON, with the aim to explore the mediating role of the confounding variable social media exposure.

Participants

The inclusion criteria for this study were studying at a university, comprehending, and reading English, and owning a device with internet access. In the end, 334 university students participated in the survey. 92 participants needed to be eliminated from the data set due to not completing the survey (84), not giving consent (4), giving unrealistic answers (2) (e.g., the height of 3m), and did not meet the inclusion criteria of having at least one active social media account or spending time on social media platforms (2). Therefore, 242 participants represented the final data set. The response rate for this survey was 73%.

Furthermore, the relevant data about the demographics of the participants can be described. The age of the participants ranged from 18 to 34, with a mean age of 21,5 (SD = 2.6). The sample was heterogeneous since 53 males, 185 females and 4 non-binary people responded to the items. The heterogeneous character is also illustrated in the mix of different nationalities which are represented in the sample. The majority of the participants originate from Germany (58.7%), the Netherlands (12.4%), Latvia (9.5%) and 19.5% of the participants came from other countries. Examples of the other countries are Russia, Belgium, and France. Additionally, most of the respondents were Bachelor students (60.3%), next to a minority of

Master students (6.2%), and students who are enrolled for another degree (33.4%). Concerning the mental health of the subjects, 14.9% of participants stated that they had received a mental health diagnosis specifically indicating to have been diagnosed with ED, depression, or anxiety disorder.

Materials

The survey was hosted in Qualtrics (see Appendix A). The platform enables to counteract fatigue and biased answers by randomizing the questions.

Socio-demographic data

Designing the survey on Qualtrics enabled the researchers to collect data related to the participant's age, nationality, gender, current level of education, Body Mass Index (BMI), calculated by dividing weight by height, and the history of mental health condition. Asking for socio-demographic data was part of a larger study in which it was specifically focused on ON, DT, and time spent on SNSs. For instance, answers on the items about the history of the mental health condition were reported, but not further interpreted.

Questions Related to SNSs

Next to the items about socio-demographic variables, items about time spent on SNSs were included. The time spent on SNSs is measured by asking two questions. Firstly, the closed question was asked if the participant has at least one active account on SNSs. The answer to this question is necessary to know, otherwise, the variable of time spent on SNSs can be eliminated from the whole study. Secondly, to compare the time the participants spent on SNSs, the open question "Please indicate in hours how much time you spend daily on social media platforms (e.g., 3 hours)" was asked. Falling above the cut-off score of three hours means having a high duration on SNSs, whereas scoring below three hours means having a moderate duration (Selvi Karmila et al., 2020).

Orthorexia-Related Concerns

The DOS was used to assess the frequency of orthorexic tendencies in university students (Chard et al., 2018). The 10 self-reported items are answered by a four-point Likert scale with the response options "*this applies to me*" (4), "*this somewhat applies to me*" (3), "*this does not really apply to me*" (2), and "*this does not apply to me*" (1). An example of the items is "I can only enjoy eating foods considered healthy". The higher the points, the higher the frequency of ON symptoms. The maximum score is 40 points (Chard et al., 2018). A cut-off score of >30 indicates the possibility of a diagnosis of ON, a score between 25 and 29 means to be at risk for developing ON and scoring within the range of 10 until 24 implies

showing no orthorexic-related symptoms at all. Overall, the English version of the DOS shows high psychometric properties such as a high internal consistency between the items for this study ($\alpha = .84$, $k = 10$).

Drive for Thinness-Related Concerns

The EDI-2 consists of 91 questions within 12 subscales (Clausen et al., 2010). The DT subscale is one of 12 subscales of the EDI-2. The DT subscale aims to measure the differences between individuals with symptoms of anorexia and those without symptoms of anorexia (Garner et al., 1983). The scale consists of seven items such as "I eat sweets and carbohydrates without feeling nervous." or "I am preoccupied with the desire to be thinner.". The responses are rated on a 6-point Likert scale, including "*never*" (1), *"rarely"* (2)*, "sometimes"* (3), *"often"* (4 points)*, "usually"* (5), and *"always"* (6). Falling above the cut-off score of 16 on the DT subscale indicates a high tendency to develop DT (Clausen et al., 2010). According to a study by Nevonen et al. (2006), the DT subscale shows internal reliability of .89 within a nonpatient population. In the current study, the psychometric properties of the DT subscale are appropriate as well since the DT subscale has a high internal consistency ($\alpha = .84$, $k = 7$).

Procedure

The current study was approved by the Ethics Committee from the University of Twente (Requestnr.: 220321). First, the survey was designed on Qualtrics. Following this, the researchers distributed the survey via social media platforms e.g., WhatsApp and Instagram. Furthermore, participants were recruited via the SONA system of the University of Twente. Individuals being recruited over the SONA system got rewarded by receiving SONA credits, an internal reward system for participating in studies. Overall, the data collection took about two weeks in total since the study went public on the 30th of March 2022 and ended approximately on the 13th of April 2022. Students participated in this survey based on the inclusion criteria and their signed informed consent for participation (Appendix B). The latter was asked after being informed about the aim, risks, privacy regulations, and possibility to withdraw from the study. In addition to that, the participants were provided with the researchers' contact information to ask for any post-questions. Next, socio-demographic data was collected by asking for the age, nationality, gender, current level of education, height, and weight to calculate the BMI and the history of mental health conditions. Afterward, the participant's SNSs use was measured by asking a closed question about the type of the SNS and an open question for the time in hours, spent on SNSs. Finally, the participants responded to the l0 questions of the DOS scale about ON and to the seven questions of the DT subscale

about the independent variable of DT. The survey ended by reminding the participants again of the contact information.

Statistical Analysis

The collected data was analyzed by using the database Statistical Packages for the Social Sciences 28 (SPSS) as an administrator for the PROCESS Macro (Hayes, 2018; IBM Corp., 2017). Data was curated using SPSS as a first step in the statistical analysis.

In the second step, the participants' socio-demographics were analyzed by using descriptive statistics on SPSS to explore the frequencies, the percentage, the mean, the Standard Deviation (SD), the minimum (min), and maximum (max) scores. The same analysis was conducted with the newly created total scores of the DOS scale and the DT subscale as well as with the variable time spent on SNSs.

Thirdly, the frequencies and the percentages of categorical variables, created from the variables of DT, ON, BMI, and time spent on SNSs were calculated. The BMI, for example, was categorized into *Underweight* = 1 (< 18.5), *Healthy Weight* = 2 (18.5 - < 25), *Overweight* = 3 (25 - < 30) and *Obesity* = 4 (> 30) (World Health Organization, 2010).

Furthermore, the data were inspected for normality, paying special attention to the Shapiro-Wilk Test and the Q Q plots. Testing the data with the Shapiro-Wilk Test led to the result that the data is not statistically significantly different from a normal distribution (β = .95, p = .001). However, a visual inspection of the data with Q Q plots showed insignificant data deviations. Additionally, the concept of the central limit theorem revealed that the data approximates a normal distribution. Considering the results of the Q Q plots and the central limit theorem, the conclusion was drawn that the data is appropriate for conducting parametric tests (Kwak & Kim, 2017).

Following the descriptive and normality analysis, the research question of the current study was investigated by using the statistical approach of mediation analysis. The mediation analysis was conducted by making use of the SPSS software tool PROCESS Macro which enabled a quick and easy analysis of the total effect of DT on ON, including the mediating role of the confounding variable SNSs (Hayes, 2018).

Results

Descriptive Statistics

The majority of participants (76.4%) is falling in the category of healthy body weight according to the BMI calculation. Furthermore, 59.5% of the SNS users had a high duration on SNSs, whereas 40.5% engaged moderately with SNSs. Within the DOS, 83.5% of the

participants scored below the cut-off score of 25, indicating no ON-related tendencies at all. On the DT subscale, 62% of the participants scored above 16, indicating a higher display of DT symptoms. For a summary of demographic sample characteristics, see Table 1.

Table 1

Socio-Demographics of Participants (n=242)

Characteristics	*n*	*%*	*Mean*	*SD*	*Min*	*Max*
Age	242		21.45	2.55	18	34
Gender						
Female	185	76.4				
Male	53	21.9				
Non binary/ Other	4	1.7				
Education						
Hoogeschool	79	32.6				
Bachelor	146	60.3				
Master	15	6.2				
PhD	2	0.8				
Nationality						
German	142	58.7				
Dutch	30	12.4				
Latvian	23	9.5				
Other	47	19.4				
BMI			22.29	4.26	14.69	56.43
Underweight	19	7.9				
Healthy Weight	185	76.4				
Overweight	32	13.2				
Obese	6	2.5				
Mental Health Treatment						
Yes	61	25.2				
No	181	74.8				
Mental Health Diagnosis						
Yes	36	14.9				

No	206	85.1				
Time spent on social media			3.12	1.49	0.16	10.00
Moderate duration	98	40.5				
High duration	14	59.5				
ON			18.81	5.651	10.00	34.00
No ON	202	83.5				
At-risk	27	11.2				
ON	13	5.4				
DT			21.07	9.28	7.00	42.00
No Bulimia (Low DT)	92	38				
Bulimia (High DT)	150	62				

Note. BMI = Body Mass Index; ON = Orthorexia Nervosa; DT = Drive for Thinness; n = population size; SD = Standard Deviation; Min = Minimum; Max = Maximum.

Inferential Statistics

The mediation model was estimated to test for mediation effects of time spent on SNSs on the relationship between DT and ON. The outcome of the mediation model can be analysed by reporting the direct effect, the indirect effect, and the total effect computed by the PROCESS software.

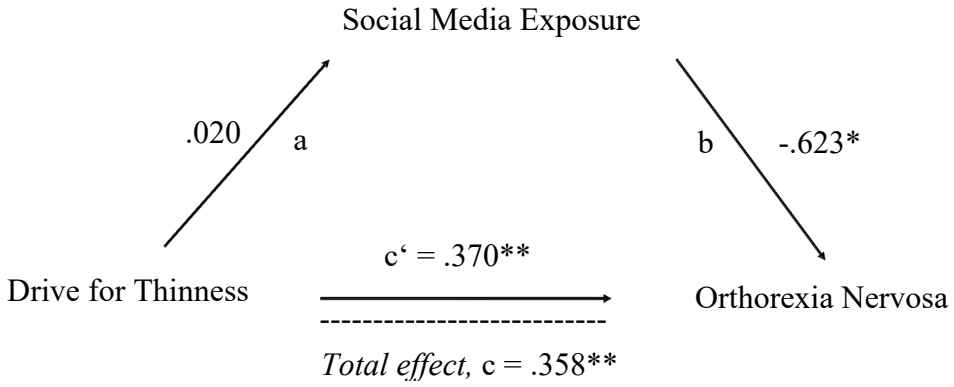
First, the direct effect of the c'-pathway (see Figure 2) was significant, indicating the predictive character of DT for ON (b = .37, *s.e.* = .03, t(240) = 11.79, p < .001).

Next, the indirect effect of the mediation variable can be described, demonstrated by the a-and b-pathway in Figure 2. It is concluded by taking the bootstrap intervals into account (b= -.01, s.e. = .01, 95% CI [-.0303, -.0001]). They revealed a negative but significant indirect effect. Differentiating between the a-and b-pathway while analyzing the indirect effect meant to find a non-significant effect from DT on time spent on SNSs (see a-pathway in Figure 2) (b = .02, *s.e.* = .01, t(240) = 1.96, p = .05) and a significant, negative relationship between SNSs and ON (see b-pathway in Figure 2) (b = - .62, *s.e.* =, t(240) = -3.17, p = .02).

Thirdly, the test resulted in a total effect, found to be positive and significant (b = .36, *s.e.* = .03, t(240) = 11.27, p < .001), thus representing a significant c-pathway.

Figure 2

Results for the direct and indirect effect of the mediation analysis for Social Media Exposure.



Note. * = $p < .05$, ** = $p < .01$.

Discussion

The aim of this study was to answer the research question to what extent time spent on SNSs mediates the relationship between DT and ON among university students. Previous research found that DT is most strongly linked with maladaptive eating patterns and thus, shows a correlation with ON (Lang & Rancourt, 2019; Madden & Chamberlain, 2004). Besides that, spending time on SNSs facilitates the development of the two mental health conditions (Frison & Eggermont, 2017). Especially, the recently growing trend on SNSs called ‘Fitspiration’ increases the risk of developing orthorexic-related symptoms (Turner & Lefevre, 2017). Furthermore, the broadcasting of thinness ideals on SNSs provokes social comparisons which may foster DT as well (Patience, 2021). Currently, there is a literature gap about time spent on SNSs, mediating the relationship between DT and ON. It is essential to fill this literature gap by gaining more knowledge about ON, and its correlations with DT and time spent on SNSs.

Interpretation of Results

In the present study, ON symptoms were analysed by using the DOS. According to the participant’s indications about ON, 5.4% of them reported experiencing ON symptoms. This result is in line with previous literature since it approximates the prevalence of ON, found in a German sample (6.9%) (Luck-Sikorski et al., 2018).

While interpreting the results of the analysis, the high prevalence of participants with having a healthy body weight is striking (76.4%). This finding is consistent with previous

literature since a study assessed a higher prevalence of healthy body weight compared to underweight, overweight, or obesity among students from 22 universities (Peltzer et al., 2014).

An additional high number was found in the participants, who indicated having DT tendencies (62%). By taking the high prevalence of healthy weight and DT tendencies into account, it might be that more participants with a healthy weight might experience a DT trend than no trend. Nevertheless, the latter is contradictory to the former research. Considering former research, a significant link between being overweight and DT was found (Laraia et al., 2021). Oberle et al. (2017) underline this finding by stating that DT develops out of an attempt for overweight people to lose weight.

Moreover, the high number of people, reporting DT tendencies could be explained by the fact that the current sample consists of university students. University students are particularly at risk for developing DT since they are in the phase of exploring their body image (Provencher et al., 2009). Another explanation for the high prevalence of DT might be that more women (76.4%) participated in the survey than men. According to literature, more women tend to display DT than men (Anderson & Bulik, 2004; Fernandez & Pritchard, 2012; McCreary & Sasse, 2002).

The Mediation Model

The Direct Effect

In the introduction, inconsistent literature emphasized the ambiguity about the correlation between DT and ON (Segura-García et al., 2012). Due to this finding, it was aimed to get a deeper insight into the relationship between ON and DT.

A significant positive correlation between DT and ON was found. This indicates that individuals displaying orthorexic-related tendencies show higher levels of DT symptoms than low DT symptoms. This result is in line with the conclusion drawn by Kelley et al. (2010) that higher DT is associated with higher rates of unhealthy eating behaviour. According to Lang and Rancourt (2019), DT is the drive most strongly linked with unhealthy eating behaviour among all other drives. Therefore, considering DT when researching a mental health condition with maladaptive eating patterns might be meaningful. Since ON is characterised by displaying maladaptive eating patterns, DT is correlated with ON specifically (Depa et al., 2019; Domingues & Carmo, 2020). Literature shows that DT is one of the main motives for ON. Depa et al. (2019) state that DT might be the main motive for ON because people believe that health problems associated with being overweight and obese could be avoided by having a thin body. Furthermore, healthy eating communities distribute messages, implying that healthy

nutrition and having good well-being require one to have a thin and fit body shape. Consequently, the more a healthy diet is pursued the higher the demand for a thin body (Håman et al., 2015).

Therefore, the contradictory finding that ON refers to individuals who are more concerned about healthy eating than losing weight is not valid in this study. It can be concluded that a desire to be thin can occur in individuals with ON tendencies.

The Indirect Effect

Although a range of different studies proved a significant correlation between time spent on SNSs and DT, the current study did not find any significant relationship between these two variables of the mediation model. Meier and Gray (2014) found that overall time on Facebook was not related to body dissatisfaction, but that engaging in photo-based activities (e.g., posting and sharing photos of oneself and friends) was. Viewing the content on these photos might lead to the emergence of DT instead of generally spending time on SNSs. For example, it plays a decisive role in whose body can be seen in the photos. Previous literature shows that DT might be only triggered when being exposed to the content of peers, and acquaintances than to celebrities (Fardouly et al., 2017). Thus, the specific content the users are consuming is determining the level of possessing DT symptoms (Turner & Lefevre, 2017). Consequently, assessing questions about the content SNS users are consuming may be more informative in understanding the link between social media and DT than measuring the total exposure time, such as in the current study.

The analysis of the relationship between SNSs and ON led to the result of a negative significant correlation. Regarding SNS and ON, a negative significant correlation means that participants who are categorised as having a high duration on SNSs (> 3 hours) show less ON tendencies. This finding is different from the results in previous literature. In most of the studies, a positive significant correlation between SNSs and ON was found, indicating the more time is spent on SNSs the more orthorexic-related symptoms are experienced (Turner & Lefevre, 2017; Woodley, 2018). One reason for the negative correlation might be the rather positive and supportive conversation in SNS communities that focus on the recovery and regaining of healthier eating behaviours (Santarossa et al., 2018). Furthermore, Fardouly and Vartanian (2016) suggest that researchers need to consider the impact of each SNS separately since it seems that not all SNSs impact people's development of unhealthy eating behaviour. Especially, picture-based SNSs are more likely to negatively affect ON, e.g. Instagram (Turner & Lefevre, 2017). In terms of the current study, participants were asked only if they have an

active account on any SNS platform, instead of focusing on one specific SNS platform. Thus, measuring time spent on SNSs, without considering a certain platform, might be misleading.

Furthermore, the analysis revealed a significant negative indirect effect. Hence, the research question can be answered by saying that the time spent on social media mediates the relationship between DT and ON among university students. The negative indirect effect exists because the positive effect of DT on ON and the negative effect of SNSs on ON cancel each other out (MacKinnon et al., 2000). Consequently, the total effect, consisting of the sum of DT, SNSs, and ON is smaller than the direct effect of DT on ON, independent of the mediator. The difference in signs and the smaller total effect are indications of SNSs, having an undermining effect on the relationship between DT and ON. It means that the relationship between DT and ON is more intense, without including the mediator. However, recognising the negative indirect effect of time spent on SNSs is beneficial due to two reasons. Firstly, it was found that the more time people spend on SNSs, the less they experience ON. According to this finding, spending time on SNSs might be advantageous since it could be a strategy to cope with ON tendencies. This result is particularly striking because it is contradictory to the results of a majority of studies, which emphasize that orthorexic-related symptoms become stronger by spending time on SNSs (Turner & Lefevre, 2017; Woodley, 2018). Therefore, it would be interesting to investigate time spent on SNSs as a coping mechanism for ON tendencies in further research. Secondly, the comparison between direct and total effect enabled to discover the actual strength of the relationship between DT and ON, independent from the mediator. Without this comparison, the strong link between DT and ON might not have been noticed. According to MacKinnon et al. (2000), recognising the negative indirect effect of SNSs increases the predictive validity of DT for ON. Thus, DT might even predict ON. In order to test a possible predictive character of DT, it should be more controlled for confounding variables such as gender in further research.

The strong correlation between DT and ON is emphasized by analysing the mediation model as having a partial effect. It means that the significant direct effect between DT and ON remains after controlling for time spent on SNSs. The remaining strength between DT and ON is an additional indication for investigating a possible prediction of DT on ON (Rucker et al., 2011).

Limitations

Overall, this study offered insights into the relationship between DT and ON, mediated by time spent on SNSs. However, it is relevant to take the limitations of the study into account. First, a limitation was found in the recruitment strategy since it induced a selection bias (Jiotsa

et al., 2021). Having used the inclusion criteria of being a university student leads to selecting a certain type of population. Consequently, the sample is representative of university students, but the results are not generalizable to the common population. Thus, people who identify as one of the sexual- or gender orientations of LGBTQ+, as well as people with different ethnicities, especially outside of Europe, are not represented by the sample. The sample size mostly represents university students from Germany and the Netherlands which is why the analysis could be biased.

A second limitation is an imbalance between the prevalence of women and men. The sample constituted predominantly of women. This gender imbalance might lead to drawing conclusions that could be prone to bias. For example, previous literature proposes, DT is considered a mental health condition that is mostly experienced by women (Anderson & Bulik, 2004; Fernandez & Pritchard, 2012; McCreary & Sasse, 2002) which could explain the high number of participants with DT tendencies. It can be concluded that women are more represented by measuring DT. Men tend to have a drive for muscularity which is not taken into account in this sample (Pingitore et al., 1997).

The last limitation is the indication of the cut-off score for DT. The cut-off score was determined by considering the norm scores for Danish people who seem to score lower than other nationalities on DT (Clausen et al., 2010). Therefore, it is difficult to classify DT according to the cut-off score since norm scores of Danish people cannot be taken to draw conclusions about a sample of university students from different nationalities.

Implications For Further Research

Future research would benefit from exploring the clinical severity of ON. The discovered information about the strong link between DT and ON should be made more public to stop the hidden nature and social acceptability of ON (Greville-Harris et al., 2019).

Building on the absence of a correlation between overall time spent on SNSs and DT, further research about specific content consumed on SNSs could be interesting. Instead of measuring the overall time on SNSs, specific content might be positively correlated with DT. For example, a recent study stated that only participants with a high appearance comparison tendency tend to develop mental health concerns (Fardouly & Vartanian, 2016). Therefore, researching content on SNSs that could trigger people's tendency to compare themselves could be an implication for further research.

Another implication for further research could be to test the ability of SNSs to reduce ON symptoms. If spending time on SNSs would decrease ON tendencies, it might be important

to explore more in what way SNSs decrease ON. For example, picture-based SNSs (e.g. Instagram) could be investigated specifically, since previous literature found a negative correlation between Instagram and ON (Turner & Lefevre, 2016). More information about this correlation would provide the possibility to integrate spending time on SNSs into prevention programs for ON (Levitt, 2003).

Furthermore, it is necessary to avoid an imbalance between the prevalence of men and women in future research since previous literature tested DT and ON mostly with samples, consisting of females. Thus, not much information is available about men, experiencing DT and ON. In addition, it is not really known that most men tend to suffer under a drive for muscularity. Providing men with adequate help in dealing with a drive for muscularity requires further research about the underlying mechanisms and consequences of the drive for muscularity.

Conclusion

In summary, the study contributed to an understanding of the increasingly prevalent mental health concern ON and its influencing factors. Since healthy nutrition is socially desired in the current times, ON is rarely recognised. The present study enabled to determine DT as a strong influencing factor for ON. This finding is of great importance because it provides more certainty around indicators for ON. An underlying reason for the strong relationship between DT and ON is time spent on SNSs since it mediates the link between the two. However, it was found that the intense correlation between DT and ON exists also without being explained by time spent on SNSs. Thus, it could be interesting to gain deeper insights into the strong relationship between DT and ON and figure out in which way time spent on SNSs would strengthen the effect of DT and ON.

References

Al Rahmi, W. M., & Othman, M. S. (2013). The impact of social media use on academic performance among university students: A pilot study. *Journal of information systems research and innovation*, 1–10. https://www.researchgate.net/publication/283723637_The_Impact_of_Social_Media_use_on_Academic_Performance_among_university_students_A_Pilot_Study

Anderson, C. B., & Bulik, C. M. (2004). Gender differences in compensatory behaviors, weight and shape salience, and drive for thinness. *Eating Behaviors*, *5*(1), 1–11. https://doi.org/10.1016/j.eatbeh.2003.07.001

Barnes, M. A. & Caltabiano, M. L. (2016). The interrelationship between orthorexia nervosa, perfectionism, body image and attachment style. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *22*(1), 177–184. https://doi.org/10.1007/s40519-016-0280-x

Barthels, F., Kisser, J., & Pietrowsky, R. (2020). Orthorexic eating behavior and body dissatisfaction in a sample of young females. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *26*(6), 2059–2063. https://doi.org/10.1007/s40519-020-00986-5

Bóna, E., Szél, Z., Kiss, D. & Gyarmathy, V. A. (2018). An unhealthy health behavior: analysis of orthorexic tendencies among Hungarian gym attendees. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *24*(1), 13–20. https://doi.org/10.1007/s40519-018-0592-0

Chard, C. A., Hilzendegen, C., Barthels, F., & Stroebele-Benschop, N. (2018). Psychometric evaluation of the English version of the Düsseldorf Orthorexie Scale (DOS) and the prevalence of orthorexia nervosa among a U.S. student sample. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *24*(2), 275–281. https://doi.org/10.1007/s40519-018-0570-6

Clausen, L., Rosenvinge, J. H., Friborg, O., & Rokkedal, K. (2010). Validating the Eating Disorder Inventory-3 (EDI-3): A comparison between 561 female eating disorders patients and 878 females from the general population. *Journal of Psychopathology and Behavioral Assessment*, *33*(1), 101–110. https://doi.org/10.1007/s10862-010-9207-4

Dalley, S. E., & Buunk, A. P. (2009). "Thinspiration" vs. "fear of fat". Using prototypes to predict frequent weight-loss dieting in females. *Appetite*, *52*(1), 217–221. https://doi.org/10.1016/j.appet.2008.09.019

Dell'Osso, L., Carpita, B., Muti, D., Cremone, I. M., Massimetti, G., Diadema, E., Gesi, C., & Carmassi, C. (2017). Prevalence and characteristics of orthorexia nervosa in a sample of university students in Italy. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *23*(1), 55–65. https://doi.org/10.1007/s40519-017-0460-3

Depa, J., Barrada, J., & Roncero, M. (2019). Are the motives for food choices different in orthorexia nervosa and healthy orthorexia? *Nutrients*, *11*(3), 697. https://doi.org/10.3390/nu11030697

Domingues, R. B., & Carmo, C. (2020). Orthorexia nervosa in yoga practitioners: relationship with personality, attitudes about appearance, and yoga engagement. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *26*(3), 789–795. https://doi.org/10.1007/s40519-020-00911-w

Dondzilo, L., Rieger, E., Jayawardena, N., & Bell, J. (2018). Drive for thinness versus fear of fat: approach and avoidance motivation regarding thin and non-thin images in women. *Cognitive Therapy and Research*, *43*(3), 585–593. https://doi.org/10.1007/s10608-018-9989-3

Donini, L. M., Marsili, D., Graziani, M. P., Imbriale, M., & Cannella, C. (2004). Orthorexia nervosa: A preliminary study with a proposal for diagnosis and an attempt to measure the dimension of the phenomenon. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *9*(2), 151–157. https://doi.org/10.1007/bf03325060

Douma, E. R., Valente, M. & Syurina, E. V. (2021). Developmental pathway of orthorexia nervosa: Factors contributing to progression from healthy eating to excessive preoccupation with healthy eating. Experiences of Dutch health professionals. *Appetite*, *158*, 105008. https://doi.org/10.1016/j.appet.2020.105008

Fardouly, J., & Vartanian, L. R. (2016). Social media and body image concerns: current research and future directions. *Current Opinion in Psychology*, *9*, 1–5. https://doi.org/10.1016/j.copsyc.2015.09.005

Fardouly, J., Willburger, B. K., & Vartanian, L. R. (2017). Instagram use and young women's body image concerns and self-objectification: Testing mediational pathways. *New Media & Society*, *20*(4), 1380–1395. https://doi.org/10.1177/1461444817694499

Fernandez, S., & Pritchard, M. (2012). Relationships between self-esteem, media influence and drive for thinness. *Eating Behaviors*, *13*(4), 321–325. https://doi.org/10.1016/j.eatbeh.2012.05.004

Frison, E., & Eggermont, S. (2017). Browsing, posting, and liking on Instagram: the reciprocal relationships between different types of Instagram use and adolescents' depressed mood. *Cyberpsychology, Behavior and Social Networking*, *20*(10), 603–609. https://doi.org/10.1089/cyber.2017.0156

Funk, C. & Kennedy, B. (2016). The new food fights: US public divides over food science. *Pew Research Center*, 1–100.

https://www.agandruralleaders.org/sites/default/files/summit/handouts2017/The%20New%20Food%20Fights.pdf

Garner, D. M., Olmstead, M. P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders*, *2*(2), 15–34. https://doi.org/10.1002/1098-108X(198321)2:2<15::AID-EAT2260020203>3.0.CO;2-6

Greville-Harris, M., Smithson, J., & Karl, A. (2019). What are people's experiences of orthorexia nervosa? A qualitative study of online blogs. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *25*(6), 1693–1702. https://doi.org/10.1007/s40519-019-00809-2

Håman, L., Barker-Ruchti, N., Patriksson, G., & Lindgren, E. C. (2015). Orthorexia nervosa: An integrative literature review of a lifestyle syndrome. *International Journal of Qualitative Studies on Health and Well-Being*, *10*(1), 26799. https://doi.org/10.3402/qhw.v10.26799

Hanganu-Bresch, C. (2019). Orthorexia: eating right in the context of healthism. *Medical Humanities*, *46*(3), 311–322. https://doi.org/10.1136/medhum-2019-011681

Hayes, A. F. (2018). The PROCESS macro for SPSS and SAS (Version 3.0). http://www.processmacro.org/download.html

Holland, G., & Tiggemann, M. (2016). A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image*, *17*, 100–110. https://doi.org/10.1016/j.bodyim.2016.02.008

IBM Corp. (2017). IBM SPSS Statistics for Macintosh (Version 25) [Computer software]. Armonk, NY: IBM Corp. https://www.ibm.com/analytics/spss-statistics-software

Jiotsa, B., Naccache, B., Duval, M., Rocher, B., & Grall-Bronnec, M. (2021). Social media use and body image disorders: association between frequency of comparing one's

own physical appearance to that of people being followed on social media and body dissatisfaction and drive for thinness. *International Journal of Environmental Research and Public Health*, *18*(6), 2880. https://doi.org/10.3390/ijerph18062880

Kelley, C. C. G., Neufeld, J. M., & Musher-Eizenman, D. R. (2010). Drive for thinness and drive for muscularity: Opposite ends of the continuum or separate constructs? *Body Image*, *7*(1), 74–77. https://doi.org/10.1016/j.bodyim.2009.09.008

Koven, N., & Abry, A. (2015). The clinical basis of orthorexia nervosa: emerging perspectives. *Neuropsychiatric Disease and Treatment*, 385. https://doi.org/10.2147/ndt.s61665

Kwak, S. G., & Kim, J. H. (2017). Central limit theorem: the cornerstone of modern statistics. *Korean Journal of Anesthesiology*, *70*(2), 144. https://doi.org/10.4097/kjae.2017.70.2.144

Lang, B., & Rancourt, D. (2019). Drive for leanness: potentially less maladaptive compared to drives for thinness and muscularity. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *25*(5), 1213–1223. https://doi.org/10.1007/s40519-019-00753-1

Laraia, B. A., Leung, C. W., Tomiyama, A. J., Ritchie, L. D., Crawford, P. B. & Epel, E. S. (2021). Drive for thinness in adolescents predicts greater adult BMI in the Growth and Health Study cohort over 20 years. *Obesity*, *29*(12), 2126–2133. https://doi.org/10.1002/oby.23285

Levitt, D. H. (2003). Drive for Thinness and Fear of Fat: Separate Yet Related Constructs? *Eating Disorders*, *11*(3), 221–234. https://doi.org/10.1080/10640260390218729

Luck-Sikorski, C., Jung, F., Schlosser, K., & Riedel-Heller, S. G. (2018). Is orthorexic behavior common in the general public? A large representative study in

Germany. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *24*(2), 267–273. https://doi.org/10.1007/s40519-018-0502-5

MacKinnon, D. P. (2000). Equivalence of the mediation, confounding and suppression effect. *Prevention Science*, *1*(4), 173–181. https://doi.org/10.1023/a:1026595011371

Madden, H., & Chamberlain, K. (2004). Nutritional health messages in women's magazines: a conflicted space for women readers. *Journal of Health Psychology*, *9*(4), 583–597. https://doi.org/10.1177/1359105304044044

McCreary, D., & Sasse, D. (2002). Gender differences in high school students' dieting behavior and their correlates. *International Journal of Men's Health*, *1*(2), 195–213. https://doi.org/10.3149/jmh.0102.195

Meier, E. P. & Gray, J. (2014). Facebook photo activity associated with body image disturbance in adolescent girls. *Cyberpsychology, Behavior, and Social Networking*, *17*(4), 199–206. https://doi.org/10.1089/cyber.2013.0305

Nevin, S. M. & Vartanian, L. R. (2017). The stigma of clean dieting and orthorexia nervosa. *Journal of Eating Disorders*, *5*(1). https://doi.org/10.1186/s40337-017-0168-9

Nevonen, L., Clinton, D., & Norring, C. (2006). Validating the EDI-2 in three Swedish female samples: Eating disorders patients, psychiatric outpatients and normal controls. *Nordic Journal of Psychiatry*, *60*(1), 44–50. https://doi.org/10.1080/08039480500504537

Oberle, C. D., Samaghabadi, R. O., & Hughes, E. M. (2017). Orthorexia nervosa: Assessment and correlates with gender, BMI, and personality. *Appetite*, *108*, 303–310. https://doi.org/10.1016/j.appet.2016.10.021

Parra-Fernández, M. L., Rodríguez-Cano, T., Onieva-Zafra, M. D., Perez-Haro, M. J., Casero-Alonso, V., Fernández-Martinez, E., & Notario-Pacheco, B. (2018).

Prevalence of orthorexia nervosa in university students and its relationship with psychopathological aspects of eating behaviour disorders. *BMC Psychiatry*, *18*(1). https://doi.org/10.1186/s12888-018-1943-0

Patience, S. (2021). Can healthy eating go too far? Identifying orthorexia. *Independent Nurse*, *2021*(2), 18–21. https://doi.org/10.12968/indn.2021.2.18

Peltzer, K., Pengpid, S., Samuels, T., Özcan, N., Mantilla, C., Rahamefy, O., Wong, M., & Gasparishvili, A. (2014). Prevalence of Overweight/Obesity and Its Associated Factors among University Students from 22 Countries. *International Journal of Environmental Research and Public Health*, *11*(7), 7425–7441. https://doi.org/10.3390/ijerph110707425

Peñas-Lledó, E., Bulik, C. M., Lichtenstein, P., Larsson, H. & Baker, J. H. (2015). Risk for self-reported anorexia or bulimia nervosa based on drive for thinness and negative affect clusters/dimensions during adolescence: A three-year prospective study of the TChAD cohort. *International Journal of Eating Disorders*, *48*(6), 692–699. https://doi.org/10.1002/eat.22431

Provencher, V., Polivy, J., Wintre, M. G., Pratt, M. W., Pancer, S. M., Birnie-Lefcovitch, S., & Adams, G. R. (2009). Who gains or who loses weight? Psychosocial factors among first-year university students. *Physiology & Behavior*, *96*(1), 135–141. https://doi.org/10.1016/j.physbeh.2008.09.011

Ross Arguedas, A. A. (2020). “Can naughty be healthy?”: Healthism and its discontents in news coverage of orthorexia nervosa. *Social Science & Medicine*, *246*, 112784. https://doi.org/10.1016/j.socscimed.2020.112784

Rucker, D. D., Preacher, K. J., Tormala, Z. L., & Petty, R. E. (2011). Mediation Analysis in Social Psychology: Current Practices and New Recommendations. *Social and*

Personality Psychology Compass, *5*(6), 359–371. https://doi.org/10.1111/j.1751-9004.2011.00355.x

Sands, R. (2000). Reconceptualization of body image and drive for thinness. *International Journal of Eating Disorders*, *28*(4), 397–407. https://doi.org/10.1002/1098-108X(200012)28:4<397::AID-EAT7>3.0.CO;2-U

Santarossa, S., Lacasse, J., Larocque, J., & Woodruff, S. J. (2018). #Orthorexia on Instagram: a descriptive study exploring the online conversation and community using the Netlytic software. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *24*(2), 283–290. https://doi.org/10.1007/s40519-018-0594-y

Segura-García, C., Papaianni, M. C., Caglioti, F., Procopio, L., Nisticò, C. G., Bombardiere, L., Ammendolia, A., Rizza, P., de Fazio, P., & Capranica, L. (2012). Orthorexia nervosa: a frequent eating disordered behavior in athletes. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *17*(4), 226–233. https://doi.org/10.3275/8272

Selvi Karmila, Evawany Y. Aritonang, & Etti Sudaryati. (2020). The Relationship of the Duration of Social Media Instagram Usage and Student's Eating Behavior in University of Sumatera Utara, 2019. *Britain International of Humanities and Social Sciences (BIoHS) Journal*, *2*(1), 289–295. https://doi.org/10.33258/biohs.v2i1.190

Sharma, M. K., John, N., & Sahu, M. (2020). Influence of social media on mental health. *Current Opinion in Psychiatry*, *Publish Ahead of Print*. https://doi.org/10.1097/yco.0000000000000631

Thompson, J. K., & Stice, E. (2001). Thin-Ideal Internalization: Mounting Evidence for a New Risk Factor for Body-Image Disturbance and Eating Pathology. *Current Directions in Psychological Science*, *10*(5), 181–183. https://doi.org/10.1111/1467-8721.00144

Turner, P. G., & Lefevre, C. E. (2017). Instagram use is linked to increased symptoms of orthorexia nervosa. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *22*(2), 277–284. https://doi.org/10.1007/s40519-017-0364-2

Varga, M., Dukay-Szabó, S., Túry, F., & van Furth Eric, F. (2013). Evidence and gaps in the literature on orthorexia nervosa. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *18*(2), 103–111. https://doi.org/10.1007/s40519-013-0026-y

Vogel, E. A., Rose, J. P., Okdie, B. M., Eckles, K. & Franz, B. (2015). Who compares and despairs? The effect of social comparison orientation on social media use and its outcomes. *Personality and Individual Differences*, *86*, 249–256. https://doi.org/10.1016/j.paid.2015.06.026

Wiederhold, B. K. (2019). Instagram: Becoming a Worldwide Problem? *Cyberpsychology, Behavior, and Social Networking*, *22*(9), 567–568. https://doi.org/10.1089/cyber.2019.29160.bkw

Woodley, A. (2018). How does Instagram impact on people's perceptions of their appearance? *Journal of Aesthetic Nursing*, *7*(2), 94–95. https://doi.org/10.12968/joan.2018.7.2.94

World Health Organization. (2010). *A healthy lifestyle - WHO recommendations*. (2010, 6. Mai). World Health Organization. https://www.who.int/europe/news-room/fact-sheets/item/a-healthy-lifestyle---who-recommendations

World Health Organization. (2020). *Healthy diet*. https://www.who.int/news-room/fact-sheets/detail/healthy-diet

Yamamiya, Y., Shroff, H. & Thompson, J. K. (2008). The tripartite influence model of body image and eating disturbance: A replication with a Japanese sample. *International Journal of Eating Disorders*, *41*(1), 88–91. https://doi.org/10.1002/eat.20444

You, S. & Shin, K. (2020). Sociocultural Influences, Drive for Thinness, Drive for Muscularity, and Body Dissatisfaction among Korean Undergraduates. *International Journal of Environmental Research and Public Health*, *17*(14), 5260. https://doi.org/10.3390/ijerph17145260

Appendix A

Survey

1. ***Items about socio-demographic data and Social Network Site use***

Please indicate your age in numbers.

_____

Please indicate your nationality.

_____

Please indicate your gender.

o Male

o Female

o Non-binary / third gender

o Prefer not to say

Please indicate your current level of education.

o Hoogeschool

o Bachelor

o Master

o PhD

Please indicate the following measures:

o Weight (in kg): _____

o Height (in cm): _____

Please indicate whether you have at least one active account on the following social media platforms: Instagram, Facebook, Twitter, Snapchat, YouTube, TikTok or on other.

o Yes
o No

Please indicate in **hours** how much time you spend **daily** on social media platforms (e.g., 3 hours).

_____

Have you ever sought psychological or pharmacological treatment for any mental health concerns (e.g., anxiety, depression, eating disorders)? If yes, please mention.

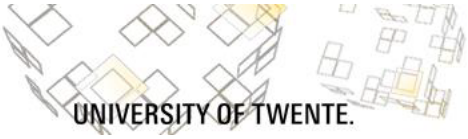
o Yes: _____
o No

Have you ever been diagnosed with a mental health condition? If yes, please mention.

o Yes: _____

o No

2. ***DOS – Scale***



In the next part you will be asked several questions about your eating behaviour.

Please indicate how much the following statements concerning nutrition apply to you:

	This does not apply to me	This does not really apply to me	This somewhat applies to me	This applies to me
Eating healthy food is more important to me than indulgence/ enjoying the food.	o	o	o	o
I have certain nutrition rules that I adhere to.	o	o	o	o
I can only enjoy eating foods considered healthy.	o	o	o	o
I try to avoid getting invited over to friends for dinner if I know they do not pay attention to healthy nutrition.	o	o	o	o
I like that I pay more attention to healthy nutrition than other people.	o	o	o	o
If I eat something I consider unhealthy, I feel really bad.	o	o	o	o
I have the feeling of being excluded by my friends and colleagues due to my strict nutrition rules.	o	o	o	o
My thoughts constantly revolve around eating	o	o	o	o

healthy nutrition and I organize my day around it.				
I find it difficult to go against my peronal dietry rules.	o	o	o	o
I feel upset after eating unhealty foods.	o	o	o	o

3. EDI -2 – Drive for Thinness subscale

In the next part, you will be asked several questions about how you feel and think about your body.

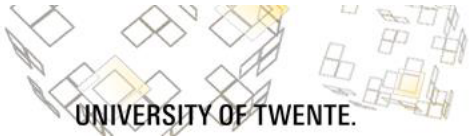
Please indicate how much the following statements apply to you:

	Never	Rarely	Sometimes	Often	Usually	Always
I eat sweets and carbohydrates without feeling nervous.	o	o	o	o	o	o
I think about dieting.	o	o	o	o	o	o
I feel extremely guilty after overeating.	o	o	o	o	o	o
I am terrified of gaining weight.	o	o	o	o	o	o
I exaggerate or magnify the importance of weight.	o	o	o	o	o	o

I am preoccupied with the desire to be thinner.	o	o	o	o	o	o
If I gain a pound, I worry that I will keep gaining.	o	o	o	o	o	o

Appendix B

Informed Consent



Information sheet for Participation in a Survey
- The University of Twente -

Description of the survey and your participation

You are invited to participate in a survey conducted by Monique Höber, Anastasija Minina, Janna-Marie Esser, Julia Fleischmann and Mia Wiesmann supervised by Alexandra Ghita. The purpose of this survey is to gain further insights into your personal experiences with the use of social media in relation to your physical and mental health. We would like to investigate the relationship between eating behaviour, social media use and health in the life of university students.
The survey will last approximately 15 minutes. The survey will be anonymous so no information can be traced back to your person.

Risks and discomforts

There are no known risks associated with this survey.

Potential benefits

There are no known benefits to you that would result from your participation in this survey. This survey may help us to gain adequate knowledge to have more insight into today's lifestyle of university students.

Protection of confidentiality

Your identity will not be revealed in any publication resulting from this survey. We will interpret your data and use it to analyze overall results, but your answers are completely anonymous. The data will not be used for any other purpose than for our study.

Voluntary participation

Your participation in this survey is voluntary. You may withdraw at any moment.

Consent Form for Survey

I have read and understood the study information, or it has been read to me. I consent voluntarily to be a participant in this survey and understand that I can refuse to answer questions and I can withdraw from the questionnaire at any time, without having to give a reason. Furthermore, I understand that taking part in the study involves interpreting my data anonymously.

Risks associated with participating in the study

I understand that taking part in the study involves no risks.

Use of the information in the study

I understand that information I provide will be used for the study and to gain adequate knowledge by interpreting my results and data. I understand that personal information collected about me that can identify me, such as [e.g., my age], will not be shared beyond the study team. I agree that my information can be quoted in research outputs.

Contact information

If you have questions or concerns about your participation in this survey, please contact Alexandra Ghita (alexandra.ghita@utwente.nl) or Mia Wiesmann (m.wiesmann@student.utwente.nl)

I have accurately read out the information sheet and agree to participate voluntarily in this survey.

o Yes
o No