Orthorexia Nervosa and Healthy Eating Vlogs: A Social Media Motives Approach

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Abstract

Objective. Orthorexia nervosa (ON) is a novel mental health concern dealing with the permanent preoccupation for eating the "right" or "pure" foods. The present study investigated the relationship between ON, YouTube consumption, healthy eating vlogs and social media motives among university students. ***Method.*** In this study, 236 participants (M_{age}=21.52, *SD*=2.52; 193 female and 39 male) were recruited via convenience sampling. The students completed an online survey including demographic data (age, gender, nationality, current education) and the items regarding their *YouTube consumption* and *consumption of healthy eating vlogs*. Further, the ORTO-15 measured *ON related symptoms* and the Social Media Motives Scale was used to determine the student's *motives for social media consumption*. ***Results.*** The results showed a ON prevalence of 69.1% in this sample (*M* = 37.55, *SD* = 3.81). There were tendencies for higher YouTube and healthy eating vlog consumption among individuals with more ON related symptoms than for those with lower ON related symptoms. Additionally, purposive motives for social media consumption were significantly associated with YouTube consumption. This means that students using social media purposefully, watched more YouTube content. Even though YouTube and purposive motives were correlated there was no correlation found between ON and active social media motives such as self-actualization motives, self-enhancement motives and purposive motives. ***Conclusion.*** The present study demonstrated an association between YouTube and especially healthy eating vlogs and ON related symptoms. Further research is necessary to validate these findings. Moreover, contrary to previous research, the current study did not establish (or find) a clear relationship between social media motives and ON related symptoms. Future research should continue investigating the possible influence of internal factors such as social media motives on the known association between ON and social media.

Keywords: Orthorexia nervosa, YouTube, vlogs, social media motives, nutrition

Introduction

Modern social media is ever-changing and constantly adapting to new trends. The popularity of social media platforms (e.g. Facebook or Instagram) peaked in the last decade, especially the platform YouTube has gained popularity (Poushter et al., 2018). Generally, YouTube is used by 75% of adults in the United States, and 94% of young adults use it every day, which strongly outpaced other social media platforms (Smith & Anderson, 2018). Furthermore, since adolescents use social media for up to three hours daily, it composes a significant part of many young people's lives (Vannucci et al., 2020). Furthermore, social media has become an essential factor in individuals' schemas of cognitive processing (Jameel et al., 2019). Moreover, social media content, especially on YouTube, is versatile and attracts many audiences with diverse interests (Molyneaux, 2008).

One popular type of YouTube content are *video blogs*, commonly known as "vlogs". Vlogs are a form of self-expression through videos (Christian, 2009). They are comparable to written online blogs with their easy and free accessibility (Molyneaux et al., 2008). The most common topics in vlogs reflect personal lifestyle, which is one reason why vlogs are perceived as authentic and personal (Godwin-Jones, 2007; Molyneaux et al., 2008). Moreover, YouTube is a highly interactive platform that enables direct feedback to *content creators* or "vloggers" (Miranova, 2016). Besides that, this interaction and personal themes of vlogs offer their audience a feeling of community and connection (Biel & Gatica-Perez, 2012). Often, vloggers also function as role models and significantly influence their audiences' attitudes (Mironova, 2016). Further, vloggers usually serve as influencing figures regarding the themes of their vlogs (Maj, 2018).

One of the most popular themes in vlogs is food. Vlogs like "What I eat in a day" take the audience along for a full day while preparing, cooking, and consuming meals (Maj, 2018). Within these vlogs, content creators also share their opinions and values regarding food. In many cultures, eating is attached to specific values, and vlogs can therefore be a source of value adoption while also being linked to healthism beliefs (Sandal, 2018). Previous research has determined that vloggers' beliefs and attitudes towards healthy eating lifestyles influence their audience in terms of lifestyle adoption (Hajili, 2014). Therefore, when the content of the vlog is perceived as a reliable source in terms of lifestyle, it may determine the user's cognitive and behavioural patterns (Hajli, 2014; Vaterlaus et al., 2015). Moreover, social media offers the

opportunity to gather information and inspiration about food and eating styles. In addition, it can be used as a measure of self-presentation, which may affect users' patterns of eating behaviour (Vaterlaus et al., 2015).

Indeed, vlog consumption was associated with food choices, for instance the choice of beverages two years later (Smit et al., 2020). Likewise, social media and especially vlogs facilitate developing and maintaining certain norms regarding eating behavioural patterns (Hawkins et al., 2020). These influences may be positive, as they can motivate healthy eating choices (Vaterlaus et al., 2014). Frequently, the intention for sharing food and eating content is also positive because content creators advocate for healthy eating and offer social support during their vlogs (Chung et al., 2017). In contrast, there may also be negative influences of food and eating content on social media. For instance, exposure to other individuals' eating behaviours on social media might lead to increased comparison to unrealistic standards (Santarossa & Woodruff, 2017).

Further, some individuals experience feelings of guilt when not following the eating habits of the vloggers (Sandal, 2018). Experiencing guilt corresponds with the finding that general social media use was associated with eating disorder-related symptoms (Santarossa & Woodruff, 2017). Another association was found between the mental health concern orthorexia nervosa and social media, especially for Instagram users, one of the most commonly used social media platforms among adolescents and young adults (Turner & Lefevre, 2017).

Orthorexia nervosa

Orthorexia nervosa (ON) is the established name for a novel mental health concern that is not yet included in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; DSM–5; American Psychiatric Association, 2013) (Donini et al., 2005). Overall, ON reflects less consideration with the quantity of food but more with the quality of food since individuals with orthorexia have a strong urge to eat foods perceived as 'clean', 'pure' or 'correct' (Dunn & Bratman, 2016; Hanganu-Bresch, 2019; Moroze et al., 2014). A considerable amount of research focused on ON attempted to develop diagnostic criteria. One set of specific diagnostic criteria was proposed by Moroze et al. (2014), among others. Individuals with ON-related symptoms experience an obsession with the quality of the foods they consume. This preoccupation harms them either physically or psychologically, resulting in a lower overall quality of life (Koven & Abry, 2015). Besides, this constant obsession occurs without the presence of another

psychological disorder, and their diet restrictions are not due to religious beliefs or medical prescription (Moroze et al., 2014). Essentially, the particular diet adopted by individuals with ON is not the core issue but the preoccupation with health and attitudes towards the chosen diet is (McGovern et al., 2020).

The scientific interest in ON is often motivated by the adverse effects of ON. Among its physical effects are severe malnourishment or starvation and, in severe cases, the same health risks observed in anorexia nervosa (AN) patients (Domini et al., 2005; Koven & Abry, 2015). Individuals suffering from AN are often unable to sustain a healthy weight and are intensely concerned with their body image (Bulik et al., 2005). Psychological effects are mainly negative affective responses such as guilt, frustration or constant worrying due to not keeping up with diet standards. Those affective responses often lead to even more restriction, purging or fasting, leading to binge eating, as observed in different eating disorders (McGovern et al., 2020; Sidani et al., 2016). The social effects are often isolation and interpersonal problems and a general decrease in quality of life (Dunn & Bratman, 2016; Koven & Abry, 2015). These significant consequences reflect the primary rationale for the growing interest in understanding ON.

Even though there is a growing interest in ON, it is still difficult to diagnose ON due to overlapping other psychopathologies such as obsessive-compulsive disorder (OCD) or AN. Traits like perfectionism, anxiety and rigidity are integral to all three disorders (Koven & Abry, 2015). Individuals that suffer from OCD experience obsessions or compulsions that seem unreasonable and cause them distress to a disabling extent (Leckman et al., 2010). Comparable to the OCD spectrum, individuals with ON suffer from intrusive thoughts and obsession over rituals for their meal preparation and contamination through food (Donini et al., 2005; Dunn & Bratman, 2016; Koven & Abry, 2015). In addition, AN symptoms like guilt regarding eating behaviour, lack of insights into one's behaviour and ego-syntonic tendencies overlap strongly with ON symptoms (Koven & Abry, 2015).

Nevertheless, there is one major difference between ON and AN. While most eating disorders are focused on body image and mainly drive for thinness, the primary rationale of ON behaviours is achieving complete health or preventing illness (McGovern et al., 2020). Regardless, the underlying mechanisms that determine the co-occurrence of ON and other eating disorders are unclear. However, body image and weight concerns commonly found in other eating disorders can also be facilitators of ON behaviours (McGovern et al., 2020).

ON and healthy eating vlogs

While factors such as body consciousness were direct determinants of ON, the relationship between social media and ON requires more research to be clearly determined. It would be too "simplistic" to display social media in general as a trigger or sole predecessor of ON (Gann, 2019). Social media is often used to gather information about food and diets but is not central to the aetiology of ON (Cheshire et al., 2020). Rather, internal factors such as worrying about one's health condition, healthism beliefs and personality traits are most important (Cheshire et al., 2020; Perugini & Solano, 2020). Healthism beliefs imply that absolute health is the only way to achieve well-being. Moreover, it implies that health is solely determined by an individual's behaviour and lifestyle choices while wholly neglecting influences on health that the individual cannot control (Crawford, 1980; Hanganu-Bresch, 2019). Nevertheless, external factors like individuals' social surroundings, past traumatic experiences, social belongingness, and even societal factors strongly influence individuals experiencing ON (Cheshire et al., 2020). Furthermore, health professionals still suggest a link between health and diet advice shared through social media and the development of ON (Douma et al., 2021).

Moreover, there is currently no causal relationship demonstrated between healthy eating vlogs and the development of ON. Overall, research about healthy eating vlogs is still scarce and frequently focuses on the perspective of the vloggers only (Biel & Gatica-Perez, 2012; Maj, 2018). Therefore, the influence of YouTube vlogs on the development of ON is still unclear can only be assumed through inference from other channels of social media such as Instagram. For instance, in a study by Turner and Lefevre (2017), higher Instagram use was linked to more ON symptoms. Specifically, this effect was only found for Instagram and not for other social networking sites (SNS). The link between Instagram and ON might be evident because Instagram is an image-focused SNS just like YouTube and pictures are better recalled and may therefore have a larger influence (Turner & Lefevre, 2017). The image-based nature would suggest a similar relationship between YouTube vlogs and ON. For instance, Gann (2019) showed that social media itself is not associated with ON, but different internal factors are. Image focused platforms such as Instagram and YouTube may serve as continuous reinforcers of behaviours associated with ON, for example, via healthy eating influencers serving as role models or authorities (Turner & Lefevre, 2017). However, internal factors could be the crucial causal factor (Turner & Lefevre, 2017).

Social media motives

One suggested internal factor for the development of ON among consumers of healthy eating vlogs are the *motives* for social media use. The term *healthy eating vlog consumption* will be used consecutively since YouTube enables active creation and passive watching of the produced content. Therefore, the focus lies on solely watching or "consuming content", which implies that the term "YouTube use" would be misleading. According to Cheshire et al. (2020), individuals with orthorexia often use social media to seek information about health and food. This suggests that it might not be social media itself leading individuals to exhibit ON symptoms but maybe the way of approaching social media that makes the difference. Generally, there are different reasons for using social media. The "psychological ownership theory" explains why individuals are motivated to use social media. According to this theory, individuals use social media to satisfy their needs for self-identity, having a place and effectivity (Karahanna et al., 2015). Another study identified the motives for active participation on social media as self-expression, partaking in shaping the internet per se, and a need for belonging (Matikainen, 2015).

The uses and gratifications approach to media refers to studying the gratifications media offers and how they serve to accomplish consumers' needs and is another possibility to explore the underlying motives for social media use (Ruggiero, 2000). According to Al-Menayes (2014), the motives for social media use following the uses and gratifications approach are entertainment, personal utility, information seeking and convenience. A study by Whiting and Williams (2013) identified similar themes with several motives such as social interaction, relaxation, pass time, information sharing, expression of opinion or surveillance. Khan (2017) suppressed the previous motive to five main motives called establishing self-status, social connectivity, searching information, providing information, and hedonic purposes, which refer to consumption and participation on YouTube. Luchman et al. (2014) classified YouTube as highly content-specific and fun-related through a multidimensional scaling approach. Both studies by Kahn (2017) and Luchman et al. (2014) showed that YouTube use is serving either information gathering or spreading purposes, social purposes, and hedonic purposes.

One approach that combines the classifications above is the Social Media Motives Scale (SMMS) (Alhadabi & Karpinski, 2020). The most apparent distinction categorizes the consumers of social media with active or passive motives for consumption. Alhadabi and Karpinski (2020) suggest that *passive social media motives* are either *entertainment/hedonic motives (EM)* or

social connectivity motives (SCM). Precisely, passive consumption of healthy eating vlogs is motivated by either a need to feel connected and a tendency to exchange (SCM) or by the simple motive of seeking enjoyment (EM). In contrast, watching healthy eating vlogs could also serve a more functional purpose via the suggested *active motives*, namely *self-actualization motives (SAM)*, *self-enhancement motives (SEM)* and *purposive motives (PM)*. Specifically, active consumers of healthy eating vlogs use the vlogs to gather information regarding food and diets (PM), to seek approval of others regarding their eating beliefs (SEM), and to help them reach their personal diet goals (SAM). Therefore, these active or passive motives might influence the relationship between ON and healthy eating vlogs.

The present study

Until now, previous studies did not demonstrate a clear relationship between ON and YouTube vlogs in particular (Gann, 2019). Hence, the association can only be assumed based on prior studies focusing on other SNS such as Instagram since a relationship between ON-related symptoms and Instagram use was already established (Turner & Lefevre, 2017).

Besides this, according to previous research, the development of ON was highly associated with internal factors such as personality or beliefs and less with social media use itself. Moreover, an earlier study showed that individuals with ON tendencies often use social media to search for information regarding food and diets (Cheshire et al., 2020). Consequently, the motives for watching healthy eating vlogs could be a crucial variable for the relationship between those vlogs and ON. Healthy eating vlogs could therefore attract individuals with ON more. Through this, these individuals are then influenced by the perceived authorities of certain content creators and might adapt their moral attitudes regarding eating (Hanganu-Bresch, 2019; Maj, 2018; Turner & Lefevre, 2017). Following this reasoning, it would be plausible that individuals consuming YouTube content generally have more active motives for consuming content on YouTube. Further, consumers of healthy eating vlogs with active motives are more likely to exhibit ON symptoms than passive consumers that consume those vlogs for entertainment and connectivity purposes only.

This study aims to provide further insights about ON due to the lack of research already described. The focus lies on the relationship between social media and ON and possible affecting variables. Specifically, this present study will focus on the relationship between ON and healthy eating vlogs among university students. University students were purposefully chosen as the

sample due to the limited recruiting means for this study and the higher prevalence of ON for young adults compared to other age groups (Aksoydan & Camci, 2009). Besides the concrete focus on YouTube vlogs, the study aims to identify the possible effect of internal factors such as social media motives on the relationship of ON and healthy eating vlogs among university students. Here, the study aims to find out if different social media motives affect the relationship between ON and healthy eating vlogs. The difference between active and passive motives is especially interesting. In order to address the objectives of the current study, the following research questions (RQ) with corresponding hypotheses (H) were formulated:

RQ_1: What is the relationship between *YouTube consumption* and *ON*?

> H_1: There is a positive relationship between YouTube consumption and ON related symptoms among university students.

RQ_2: What is the relationship between watching *healthy eating vlogs* and *ON*?

> H_2: There is a positive relationship between healthy eating vlog consumption and ON related symptoms among university students.

RQ_3: What is the relationship between YouTube consumption and social media motives?

> H_3: There is a positive relationship between YouTube consumption and active social media motives among university students.

RQ_4: To what extent do *social media-related motives* affect *ON* in university students?

> H_4: There is a positive relationship between active motives for vlog consumption and ON related symptoms among university students.
>
> H_5: There is a positive relationship between PM for vlog consumption and ON related symptoms among university students.
>
> H_6: There is a positive relationship between SAM for vlog consumption and ON related symptoms among university students.

H_7: There is a positive relationship between SEM for vlog consumption and ON related symptoms among university students.

Method

Design

A correlational survey was employed by using a non-experimental cross-sectional study design. The dependent and independent variables are illustrated in Figures 1, 2, 3, and 4.

Figure 1

Dependent and independent variable for RQ_1

Figure 2

Dependent and independent variable for RQ_2

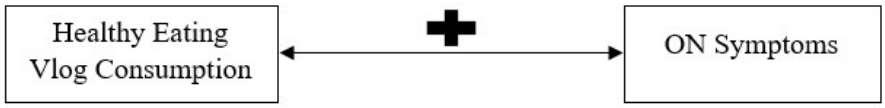


Figure 3

Dependent and independent variable for RQ_3

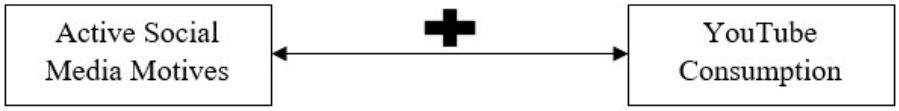
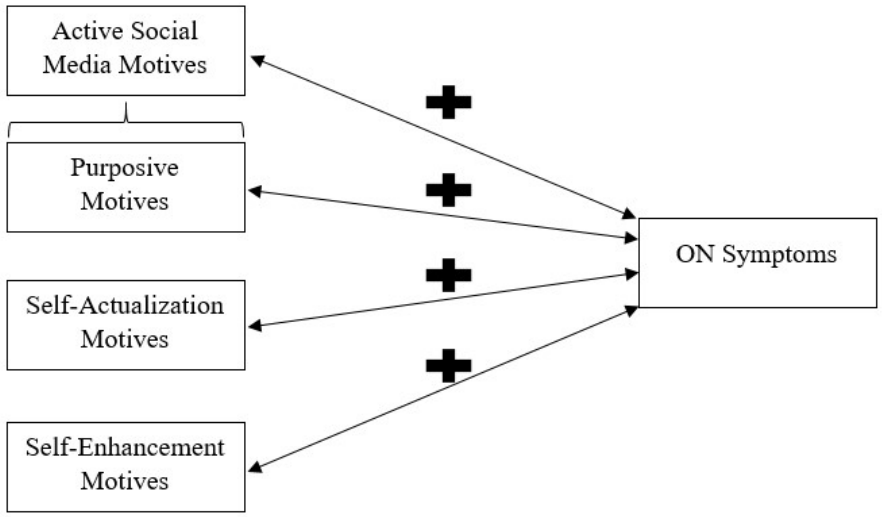


Figure 4

Dependent and independent variables for RQ_4



Participants

The inclusion criteria for this study were being university students and possessing sufficient English reading and comprehension skills. The sampling method was the main reason for limiting the sample to university students since participants were mainly recruited through an internal university network. In total, 338 students participated in the survey, but only 247 participants completed the survey. Finally, 236 participants represented the final sample. The response rate for this survey was 73%. The sample consisted of 193 females and 39 males from 25 different nationalities. Most of the participants were German (77.6%), or Dutch (10.8%), and 10.6% of the participants had other nationalities. For instance, the study included participants from many other European countries like Italy, Latvia or Finland, and participants from other continents like Asia, Africa, and North America. Most participants were Bachelor students (86%), with a minority of Master students (5%) or students following a different degree (9%). The participants' age ranged from 17 to 38, with a mean age of 21.57 (SD = 2.6).

Materials

For the purpose of the study, an online survey was developed that consisted of multiple items regarding socio-demographic data and YouTube consumption and two further scales, namely the ORTO-15 and the SMMS. The participants filled in the survey online, so a suitable

device with an internet connection was necessary. The online survey (Appendix) consisted of the following sections:

Socio-Demographic Data

The first section included demographic data, including the participants' age, gender, nationality and current education level.

YouTube Consumption ad-hoc items

Several questions were included in the survey to measure the participants' YouTube consumption. The participants indicated whether they had an account on YouTube. In order to precisely measure YouTube consumption, they indicated the time they spent on YouTube daily (in minutes). To determine the content watched on YouTube, the participants chose from a list of content including, among others, food vlogs, recipe videos and dieting videos.

ORTO-15

The ORTO-15 measures ON related symptoms or behaviours related to ON (Donini et al., 2005). Overall, the ORTO-15 consists of 15 questions corresponding to different symptoms. The answers were given on a 4-point-Likert scale with the answer possibilities '*always*' (1), '*often*' (2), '*sometimes*' (3) and '*never*' (4). Questions 2,5,8, and 9 are scored in reversed order, and the 4-point-Likert scale for questions 1 and 13 was '*never*' (1), '*always*' (2), '*sometimes*' (3) and '*often*' (4) (Stochel et al., 2015). The ORTO-15 provides a sum score that can be compared to a previously defined cut-off score. The cut-off score used for this study was 40 (Stochel et al., 2015). All participants scoring lower/higher than 40 were classified as experiencing high ON related symptoms. The ORTO-15 was validated in a Polish sample of 15- to 21-year-olds, showing acceptable reliability (Cronbach's alpha .78). Moreover, this study by Stochel et al. (2015) indicated excellent repeatability for five items (Kappa .81 to 1) and good repeatability for the remaining items (Kappa .61 to .8). Generally, the ORTO-15 is widely accepted and applied for numerous samples and cultures (Costa et al., 2017; Parra-Fernandez, 2018; Haddad et al., 2020).

Social Media Motives Scale

The SMMS consists of 30 items and measures six different motives for social media use (Alhadabi & Karpinski, 2020). Those six motives were proven sufficient to explain social media

usage in the sample and can categorize consumers of healthy eating vlogs based on their motives. Furthermore, these motives can be divided into active and passive motives. Active motives include PM, SAM and SEM. The passive motives are EM and SCM. In the present study, participants read 30 statements and indicated on a 5-point-Likert scale from 1 to 5 to what extent they disagree or agree with these statements. Examples of these statements include 'I use social media to know how to do something.', 'I use social media for sharing information.' or 'Social media enables me to do things on my pace.'. The items are scored per social media motive by summing the belonging items. The SMMS shows good psychometric properties with a construct validity demonstrated by correlational analysis and a one-way ANOVA (Alhadabi & Karpinski, 2020). Since the scale was newly developed by Alhadabi & Karpinski (2020), no other reliability measures are available.

Procedure

The data collection started on the 26th of March 2021 and ended after two weeks. The participants were recruited through non-random convenience sampling via the social media accounts of the researchers of the current study or by sharing the survey link via instant messaging channels. Additionally, participants were recruited through the platform SONA used by students at the University of Twente. Those students were granted 0.25 credit points for their participation. The data was collected through a collaborative online survey developed by four researchers and included multiple other questionnaires and items that were not relevant for the present study. The survey was developed on the website qualtrics.com approved by the Ethics Committee of the University of Twente. All students signed informed online consent before participating, including the overall aim of the study and important information regarding the participation. Afterwards, the participants indicated their socio-demographic data (e.g. age, nationality, current education) and details regarding their YouTube consumption. Next, they filled in the ORTO-15 and the Social Media Motives Scale. After filling in those questionnaires, the participants were offered the possibility to contact the researchers in case they have questions. On average, the participants took 32.8 minutes to complete the collaborative survey (SD = 73.7). The mean time for completing the relevant items for the present study could not be determined.

Data analysis

The data from the Qualtrics survey was imported into SPSS (version 25). The data analysis aimed to examine the correlation between the dependent variable *ON related symptoms* and the different independent variables and, additionally, the second dependent variable *YouTube consumption* and *active social media motives*. First, the dependent variable *ON related symptoms* was defined by the participants' total score of the ORTO-15. The independent variables vary per research question and include *time spent on YouTube, healthy eating vlog consumption,* and *social media motive. Further, time spent on YouTube* consisted of the participant's indication in minutes. The second independent variable *healthy eating vlog consumption* was defined as a simple dichotomous variable indicating whether they watch healthy eating vlogs or not. The third independent variable *social media motive* had to be computed by summing the participants' scores on the different subscales or different motives. Each participant received a score for active or passive motives by creating two new scores out of the belonging motives and six scores for the six different motives. The scores indicated how strongly every participant exhibited the motives. Finally, data were tested for normality by Shapiro-Wilk's test. Only the summed score of the Social Media Motives Scale (p = .606) and the variable *active motives* (p = .090) were normally distributed. The remaining variables were checked for outliers which were excluded in the following analyses. Based on Q-Q plots, the data was considered normally distributed with no significant deviations. As stated in the central limit theorem, large sample sizes result in approximately normally distributed data; therefore, parametric tests were employed to address the hypotheses (Kwak & Kim, 2017). After the data was prepared, descriptive statistics for the demographic variables, the general information regarding their social media use, the ORTO-15 and the different social media motives were calculated. The analyses conducted were Pearson correlations. Additionally, for hypothesis 1 and 2, T-tests and Chi-Square tests were conducted because they dealt with categorical data.

Results

Means and standard deviations for all variables and other descriptive data can be found in Table 1.

Table 1
Descriptive data of participants (n = 236)

Characteristic	n	Percentage	Mean	SD	Min	Max
Gender						
Female	193	83.2				
Male	39	16.8				
Age	232		21.52	2.52	17	38
Education						
Bachelor	199	86				
Master	12	5				
Other degree	21	9				
Nationality						
German	180	77.6				
Dutch	25	10.8				
Other	27	11.6				

In general, 70.3% of the participants indicated they have an account on YouTube. Moreover, 64% of the students use YouTube daily for up to 30 minutes. Besides, 33.1% stated that they consume *healthy eating vlogs*. Regarding the ON measure, 69.1% of the participants fell below the cut-off score of <40, indicating that most participants in this sample exhibit high *ON related symptoms*. The mean scores for the different social media motives can be found in Table 2.

Table 2

Descriptive statistics for the main variables

Characteristic	n	Percentage	Mean	SD	Min	Max
YouTube consumption						
Yes	166	29.7				
No	70	70.3				
YouTube time			42.65	50.1	.00	240.00
Vlog consumption						
Yes	78	66.9				
No	158	33.1				
Orthorexia Nervosa (Cut-off score < 40)			37.55	3.81	27.00	47.00
Yes	163	69.1				
No	73	33.1				
Active motives			2.58	.64	1.00	4.69
Purposive			16.58	3.69	5.00	25.00
Self-actualization			12.21	4.51	5.00	25.00
Self-enhancement			12.5	5.02	6.00	30.00
Passive motives			3.55	.61	1.00	5.00
Entertainment			15.02	2.67	4.00	20.00
Social connectivity			17.98	4.12	5.00	25.00
Factor of convenience			16.69	3.72	5.00	25.00

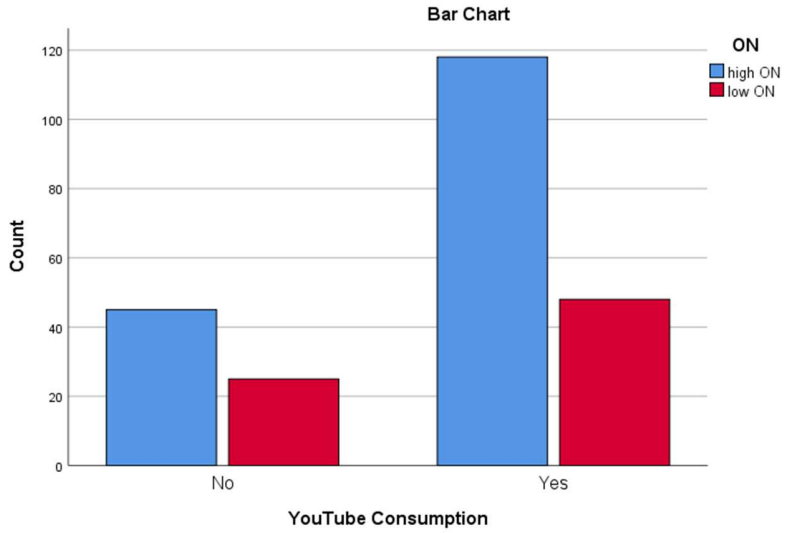
Overall, the participants scored highest on *social connectivity motives* (M = 17.98, SD = 4.12) closely followed by *factor of convenience motives* (M = 16.69, SD = 3.72) and *purposive motives* (M = 16.58, SD = 3.69). Further, the students scored higher on passive motives (M = 3.55, SD = .60) than active motives (M = 2.56, SD = .64).

Regarding H_1, there was no correlation found between time spent on YouTube and ON related symptoms (r (229) = -.07, p = .28). Further, a t-test for independent samples was conducted and revealed a non-significant but slight difference among users of *YouTube* and non-

users of *YouTube* concerning *ON related symptoms* (t (234) = -1.71, p = .09). Specifically, the results showed a higher exhibition of *ON related symptoms* among YouTube users (M = 37.28, SD = 3.85) compared to non-users (M = 38.2, SD = 3.68). Moreover, a chi-square test was conducted to test H_1 again. The results confirmed this tendency between the categorical variable *ON* and *consumption of YouTube* (X^2(1, N = 236) = 1.07, p = .30). Namely, more students diagnosed with ON (71.1%) consumed YouTube videos than those who fell above the cut-off score for ON (28.9%), as illustrated in Figure 5. The same pattern was visible among students with low *ON related symptoms*. Nevertheless, H_1 was rejected.

Figure 5

YouTube consumption and ON



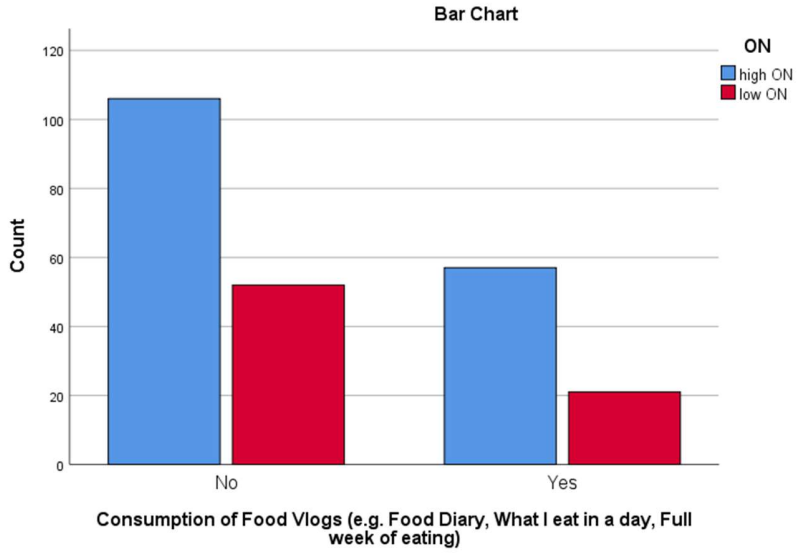
Note. YouTube consumption among university students with high and low ON related symptoms.

For H_2, there was no correlation found between time spent on YouTube and ON related symptoms (r (234) = -.04, p = .54). An additional t-test revealed no significant differences between consumers of *healthy eating vlogs* and non-consumers regarding their exhibition of *ON related symptoms* (t (234) = -.65, p = .54). However, the results revealed a slightly lower exhibition of *ON related symptoms* among consumers of *healthy eating vlogs* (M = 37.34, SD = 3.94) and non-consumers (M = 37.66, SD = 3.76), so H_2 was rejected. Nevertheless, a Chi-Square test indicated a trend between the categorical variable *ON* and consumption of *healthy eating vlogs* (X^2(1, N = 236) = .88, p = .35). More students with diagnosed with ON (73.1%) consumed

healthy eating vlogs (26.9%) than those without an exhibition of ON. The same result was visible among students with low *ON related symptoms*. These results are illustrated in Figure 6.

Figure 6

Healthy eating vlogs and ON



Note. Healthy eating vlog consumption among university students with high and low ON related symptoms.

Regarding H_3, Pearson's test showed a significant positive correlation for *YouTube consumption* and *purposive motives* (r (233) = .24, $p < 0.01$). For the other active and passive motives there were no significant correlations found ($p > .05$). The Pearson's test for H_4, H_5, H_6 and H_7 demonstrated no significant correlations between *ON related symptoms* and *active motives* (r (233) = -.68, p = .30), *purposive motives* (r (232) = -.07, p = .31), *self-actualization motives* (r (234) = -.02, p = .80) and *self-enhancement motives* (r (234) = -.1, p = .12).

Overall, there were no significant associations between *ON related symptoms* and the independent variables. Therefore, these hypotheses were rejected. However, since there was a significant positive correlation for H_3, this hypothesis was partially accepted.

Discussion

The present study explored the novel mental health concern ON and its relationship with the popular social media platform YouTube among university students. Specifically, the study focused on personal video blogs, commonly known as vlogs (Molyneaux et al., 2008). Since ON is mainly concerned with eating behaviour and food is a common topic in vlogs, the association between ON and healthy eating vlogs was investigated (Haganu-Bresch, 2019; Maj, 2018). Moreover, the association between motives for vlog consumption and ON was examined because previous studies indicated that internal factors might explain the relationship between ON and social media (Cheshire, 2020; Perugini & Solano, 2020).

The analyses showed that students with higher ON related symptoms consumed more YouTube than students scoring lower on ON related symptoms. The same result was found for the consumption of healthy eating vlogs. In addition, students with strong purposive motives consumed more YouTube than students without purposive motives showing that YouTube was often used to achieve goals or gather knowledge. Although there was an association between YouTube consumption and ON, no relationship was found between ON related symptoms and active motives for YouTube consumption. In the following, these main findings will be discussed.

Empirically grounded reflections

In this study, there was a striking prevalence of ON with 69.1%, according to the ORTO-15. Some previous studies reported a similarly high prevalence, which was commonly explained as follows (Missbach et al., 2015). The ORTO-15 was found to overestimate ON and thus fails to discriminate between disordered eating and healthy eating patterns (Dunn et al., 2017, Missbach et al., 2015). Another possible explanation for the high prevalence of ON in this study would be that the sample solely included students. A literature review by Niedzielski and Kaźmierczak-Wojtaś (2021) found ON prevalence rates ranging from 6.9% to 88.7% in different samples, indicating that different groups of individuals may be more or less susceptible to developing ON. Students often experience high stress levels, which is possibly related to ON's development since stress was found to increase the likelihood of developing ON (Bundros et al., 2016). This offers another alternative explanation for the high prevalence of ON in this sample. Concludingly, the

high prevalence of ON in this study should be considered while interpreting the following findings.

YouTube consumption and ON related symptoms

Results showed that students with higher ON related symptoms consumed more YouTube than students scoring lower on ON related symptoms. Even though there was no statistically significant difference between YouTube users and non-users, these findings indicate a tendency. Overall, ON was not yet associated with YouTube use previously, and there is a general lack of research investigating this link. Due to this, the link between ON symptoms and YouTube use was only hypothesized based on YouTube's similarity to other image-based SNSs like Instagram (Haganu-Bresch, 2019; Turner & Lefevre, 2017). Generally speaking, social media use was often associated with food choices in previous research, whereby YouTube use could possibly influence eating behaviour similarly (Smit et al., 2020). Moreover, social media use was also linked to different eating disorders, and predominantly YouTube content was found to facilitate AN (Santarossa & Woodruff, 2017; Syed-Abdul et al., 2013).

Additionally, among individuals with ON, social media is often used to retrieve information about healthy diets and eating habits (Cheshire et al., 2020). This information-seeking behaviour is one reason why eating disorders tend to be associated with and linked to social media (Sanatrossa & Woodruff, 2017). Besides, Douma et al. (2021) stated that diet advice shared on social media is associated with social media users' health condition. There is a link between seeking information about health and diet on social media and problematic eating patterns (Cheshire et al., 2020). Since most adults use YouTube daily and one of the most common topics on YouTube is food, seeking diet advice on YouTube is very likely (Maj, 2018; Smith & Anderson, 2018). Therefore, a link to ON can be assumed. This is supported in the present study, as university students watching YouTube showed higher ON related symptoms than those who did not watch YouTube. However, there was only a subtle difference between groups, and a clear link between YouTube and ON was not established. Further, no significant correlation was found between time spent on YouTube and ON symptoms, which is in line with previous studies that failed to demonstrate an association between ON and YouTube use (Turner & Lefevre, 2017). These results suggest that the relationship between YouTube consumption and ON might be more complicated.

Healthy eating vlogs and ON related symptoms

It was hypothesized that students with higher ON related symptoms consume more healthy eating vlogs than students with fewer symptoms. Indeed, in this study, students falling below the cut-off score of 40, hence experiencing high ON related symptoms, watched more healthy eating vlogs than students above the cut-off score even though this difference was only subtle again. Due to the lack of research regarding YouTube use and ON, no studies currently support this finding. This hypothesis was based on previous research investigating the relationship between ON and other image-focused content on SNSs such as Instagram. Moreover, vlogs commonly function as a source for value adoption and seeking role models (Hajili, 2014; Sandal, 2018). Additionally, food is one of the most common themes in vlogs; therefore, vloggers' eating behaviour and diet advice shared through vlogs can also influence the audience's eating behaviour (Tan et al., 2016; Vaterlaus et al., 2015). Further, the link between ON and social media content was partly explained by the information-seeking behaviour of individuals with ON in previous studies (Cheshire, 2020). Likewise, vloggers often function as reliable authorities, who are approached by information-seeking individuals with ON (Miranova, 2016). These findings offer contextual substantiation for the current results.

In contrast to these findings, individuals suffering from eating disorders also use and consume YouTube content during their recovery. In AN's case, YouTube videos promoting and supporting AN recovery are favoured over videos promoting AN-related behaviour itself (Oksanen et al., 2015). This evidence might explain the current results since this effect was already proved for the ON community on Instagram. Furthermore, individuals suffering from ON share their stories and support each other during their recovery (Valente et al., 2021). According to Valente et al. (2021), individuals with ON help each other cope with ON symptoms via social media, which results in lower ON symptoms. These findings indicate that the association between healthy eating vlogs and ON related symptoms is not clear cut since the findings in the present study were not statistically significant, and only tendencies were found. Nevertheless, other associations between ON and social media are possible.

Active social media motives and YouTube consumption

There was a positive relationship between PM and YouTube consumption, which partly supports H_3. PM were defined by Alhadabi and Karpinski (2020) as actively seeking new knowledge or working to reach an end. With SAM and SEM, PM are categorized as active

motives; hence the hypothesis can be accepted partly (Alhadabi & Karpinski, 2020). Previous research shows that YouTube is commonly used as a tool to gather health-related information (Madathil et al., 2015). Consequently, the motives for consuming health-related content are purposive and active. Further, YouTube users often turn to vloggers to seek out information regarding food (Brilianan et al., 2020).

Besides this evidence, the present study showed a high prevalence of ON related symptoms. In past research, individuals with ON were found to actively research information about food and diets online (Cheshire et al., 2020). Therefore, the high prevalence of ON in this sample may explain the relationship between YouTube consumption and purposive motives. In addition, purposive motives were the most prevalent active motives in the present study, indicating a general preference for using social media purposefully and seeking information. More specifically, this means that in case the participants demonstrated active motives for social media use, their motivation was mostly purposive. However, in this study, students generally showed greater passive motives for social media use, indicating that social media is mostly used for entertainment or connecting to others (Alhadabi & Karpinski, 2020).

Active social media motives and ON related symptoms

It was predicted that university students with higher ON related symptoms score higher on active social media motives than students with lower ON related symptoms. This was based on the previously mentioned finding that individuals with ON often use social media as an information tool about food, health and diets (Cheshire et al., 2020). Likewise, students with high ON-related symptoms were expected to use social media and especially YouTube, particularly for purposive reasons, self-enhancement, and self-actualization. Unexpectedly, the study results did not support this hypothesis because no significant correlation was found between active motives and ON-related symptoms. This result can be explained because YouTube and especially vlogs are consumed for multiple reasons that cannot be easily distinguished. On the one hand, previous research demonstrates that YouTube is mainly used for informational or social purposes alongside food in general (Khan, 2017, Maj, 2018). On the other hand, vlogs are consumed for hedonic reasons as well (Kang & Cho, 2020). Ultimately, YouTube and social media platforms are used for numerous purposes, and one cannot simply connect specific motives to a single SNSs. Moreover, the internal factors explaining the association between social media and ON are still unclear and need further research.

Lastly, it was expected that students with higher ON related symptoms would receive greater scores on the three active motives for vlog consumption, namely PM, SAM and SEM. However, these hypotheses were not supported by the present study results since there were no correlations found between ON related symptoms and the different active motives. Even though approaches specifically focusing on YouTube consumption were included in the development of the SMMS, the scale itself does not focus on YouTube in particular but social media use overall (Alhadabi & Karpinski, 2020). Hence, the participants gave their answers regarding their social media use and not particularly YouTube consumption. This might explain the lack of correlations. Future research should make clear that the focus lies on YouTube consumption to receive meaningful results. However, as described earlier, there was an association between YouTube consumption and purposive motives suggesting that YouTube was often used to gather information or attain a goal (Cheshire et al., 2020; Khan, 2017). Regarding SAM and SEM, both were associated with producing content on YouTube rather than consuming it (Jones, 2010; Matikainen, 2015). This may explain the missing relationship between those motives and ON related symptoms because ON was linked to YouTube consumption instead of production in the present study.

Limitations

Generally, the present study complied with the current scientific standards and is among the first studies exploring the relationships between vlogs and ON. However, several limitations must be considered when interpreting the results of the study.

One main limitation is the present study sample because it may lack representability for three main reasons. First, the participants were recruited by convenience sampling via a network provided by the university. Thereby, the sample was limited to students. This may have influenced the results in several ways. On the one hand, as previously reported, students experience more stress and are therefore more susceptible to develop ON (Bundros et al., 2016). On the other hand, students with a limited the age range were specifically chosen as the sample, which is visible in the mean age of 21.52. This may have influenced variable such as YouTube consumption and ON related symptoms because young adults were found to consume YouTube more and exhibit higher ON tendencies (Aksoydan & Camci, 2009; Smith & Anderson, 2018). Further, additional participants were collected via the SNS of the researchers, which led to an imbalance in the nationalities represented in the sample. Finally, since most participants were

German, the results are not representative for other nationalities or cultures. Specifically for ON, previous studies reported cultural differences that must be considered when referencing the results of this study (Gramaglia et al., 2019).

Moreover, the online survey included self-developed measures for YouTube consumption next to the validated ORTO-15 and review-based SMMS. Specifically, the survey included a multiple-answer multiple-choice question about social media content based on which consumers of healthy eating vlogs were determined. This item included numerous options, and the participants could choose multiple types of content from the list. Typically, this type of question may include ambiguous answer options, which may confuse the participants, decreasing the reliability and validity of the results (Petersen et al., 2016). Here, using a single item for healthy eating vlogs could have reduced the confusion for participants and increased the ease of responding (Sarstedt & Wilczynski, 2009). In addition, future research using a Likert-scale question may provide more nuanced findings about the healthy eating vlog consumption of the participants (Johns, 2010).

Another limitation is the recency of the SMMS by Alhadabi & Karpinski (2020). Having been recently developed, further research is needed to determine its psychometric properties clearly. The lack of a wider scientific validation implies that the results should be cautiously interpreted. Ultimately, the current study needs further validation from future studies.

Future research directions

Further research is necessary to collect additional evidence for the current findings and explore ON and its influences. This is especially true for research about ON and YouTube since there is still a lack of research connecting both. Generally, there is plenty of research investigating the relationship between ON and Instagram, even though YouTube was associated with eating disorders in previous studies (Santarossa & Woodruff, 2017; Syed-Abdul et al., 2013). Especially healthy eating vlogs are an interesting topic because they may be used as information sources for individuals suffering from ON (Cheshire et al., 2020). The present study was able to indicate tendencies, but further research is necessary to recognize the influence of YouTube and healthy eating vlogs on ON. Maybe a more exploratory approach including more open questions and detailed analyses may help to investigate those tendencies. Moreover, a longitudinal study, such as experience sampling, might give further insights into the relationship of motives for vlog consumption and ON symptoms by producing more detailed and more

extensive data through daily measures (Larson & Csikszentmihalyi, 2014). Besides, future studies should perform regression analyses to closely investigate the association between YouTube consumption or healthy eating vlogs and ON related symptoms. Through a regression model, other variables can be accounted for, such as social media motives or other possible influencing factors like the quality of the content producers or the information-seeking behaviour of users (Brilianan et al., 2020; Turner & Lefevre, 2017). Overall, there is plenty of potential for future research regarding ON and YouTube vlogs.

Another suggestion for future research is to replicate the present study with an ON measure that shows better psychometric properties and proves to be more effective. Possible measures would be the Eating Habits Questionnaire (EHQ), Teruel Orthorexia Scale (TOS) and the Düsseldorf Orthorexie Scale (DOS), which all show adequate validity and reliability (Zickgraf, 2019). Valid versions of the DOS are available in German, English and Chinese, creating a suitable alternative to the ORTO-15 (King et al., 2020; Zickgraf, 2019). Similarly, the SMMS should be validated further because there is currently no other comparable measure of motives for social media use in different populations. Since it is based on an extensive literature review, the scale is promising and can be used for future research (Alhadabi & Karpinski, 2020).

Conclusions

In spite of its limitations, the present study offers essential insights that help to better understand the mental health concern ON. Even after over two decades of research into the development and characteristics of ON, its determinants remain unclear, and the scientific interest is still present (Koven & Abry, 2015). The supposed high prevalence of ON in many samples and its influence on the quality of life justify the persistent demand for further research (Dunn & Bratman, 2016; Niedzielski & Kaźmierczak-Wojtaś, 2021). Social media's dynamic nature and its steady developments are already part of our society and thereby a relevant factor relating to ON. In past research, ON and social media proved to be associated with each other (Gann, 2019; Turner & Lefevre, 2017). Instagram was the only platform correlated with ON, and considerable literature is available (Turner & Lefevre, 2017). However, there is a deficiency of research connecting YouTube and ON, even though food is a popular recurring theme in vlogs (Maj, 2018) and the platform is used by the majority of adults (Smith & Anderson, 2018). Also, vloggers significantly influence their audience and affect health beliefs and eating behaviours (Miranova, 2016).

In conclusion, the present study was a first attempt at unravelling the relationship between YouTube consumption and ON. Moreover, the results specifically demonstrated that individuals suffering from ON consume YouTube, and healthy eating vlogs, in particular, more than healthy individuals. This finding alone underlines the importance of further research considering YouTube and ON. Besides, the present study attempted to investigate additional internal factors that may determine the development of ON and its association with social media (Cheshire et al., 2020, Perugini & Solano, 2020). Namely, the idea of motives for social media use as a determinant of the relationship between ON and social media was introduced. Ultimately, the present study provides new impulses and insights to understand ON and advance the state of research.

References

Aksoydan, E., & Camci, N. (2009). Prevalence of orthorexia nervosa among Turkish performance artists. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *14*(1), 33-37. https://doi.org/10.1007/BF03327792

Alhadabi, A., & Karpinski, A. C. (2020). Development and Psychometric Assessment of the Social Media Motives Scale among University Students. *European Journal of Educational Research*, *9*(2), 835-851. https://doi.org/10.12973/eu-jer.9.2.835

Al-Menayes, J. (2015). Motivations for Using Social Media: An Exploratory Factor Analysis. *International Journal of Psychological Studies, 7*(1), 43. https://doi.org/10.5539/ijps.v7n1p43

Biel, J.-I., & Gatica-Perez, D. (2013). The YouTube Lens: Crowdsourced Personality Impressions and Audiovisual Analysis of Vlogs. *IEEE Transactions on Multimedia, 15*(1), 41–55. https://doi.org/10.1109/TMM.2012.2225032

Bulik, C. M., Reba, L., Siega-Riz, A. M., & Reichborn-Kjennerud, T. (2005). Anorexia nervosa: definition, epidemiology, and cycle of risk. *International Journal of Eating Disorders*, *37*(1), 2-9. https://doi.org/10.1002/eat.20107

Cheshire, A., Berry, M., & Fixsen, A. (2020). What are the key features of orthorexia nervosa and influences on its development? A qualitative investigation. *Appetite, 155*, 104798. https://doi.org/10.1016/j.appet.2020.104798

Choi, J., & Kang, W. (2014). A Dynamic Examination of Motives for Using Social Media and Social Media Usage among Undergraduate Students: A Latent Class Analysis. *Procedia - Social and Behavioral Sciences, 131*, 202–210. https://doi.org/10.1016/j.sbspro.2014.04.105

Christian, A. J. (2009). Real vlogs: The rules and meanings of online personal videos. *First Monday 14*(11). https://doi.org/10.5210/fm.v14i11.2699

Chung, C. F., Agapie, E., Schroeder, J., Mishra, S., Fogarty, J., & Munson, S. A. (2017). When Personal Tracking Becomes Social: Examining the Use of Instagram for Healthy Eating. *Proceedings of the CHI Conference on Human Factors in Computing Systems*, 1674–1687. https://doi.org/10.1145/3025453.3025747

Costa, C. B., Hardan-Khalil, K., & Gibbs, K. (2017). Orthorexia nervosa: a review of the literature. *Issues in mental health nursing*, *38*(12), 980-988. https://doi.org/10.1080/01612840.2017.1371816

Donini, L. M., Marsili, D., Graziani, M. P., Imbriale, M., & Cannella, C. (2005). Orthorexia nervosa: Validation of a diagnosis questionnaire. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity, 10*(2), e28–e32. https://doi.org/10.1007/BF03327537

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

Dunn, T. M., & Bratman, S. (2016). On orthorexia nervosa: A review of the literature and proposed diagnostic criteria. *Eating Behaviors, 21*, 11–17. https://doi.org/10.1016/j.eatbeh.2015.12.006

Dunn, T. M., Gibbs, J., Whitney, N., & Starosta, A. (2017). Prevalence of orthorexia nervosa is less than 1 %: data from a US sample. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity, 22*(1), 185-192. https://doi.org/10.1007/s40519-0160258-8

Gann, L. (2019). *Orthorexia nervosa: The role of social media #cleaneating* [Doctoral dissertation, University of Iowa]. https://doi.org/10.17077/etd.m3f8-ckee

Godwin-Jones, R. (2007). Digital Video Update: YouTube, Flash, High Definition. *Language Learning & Technology, 11*(1), 16-21. http://dx.doi.org/10125/44083

Gramaglia, C., Gambaro, E., Delicato, C., Marchetti, M., Sarchiapone, M., Ferrante, D., Roncero, M., Perpiñá, C., Brytek-Matera, A., Wojtyna, E., & Zeppegno, P. (2019). Orthorexia

nervosa, eating patterns and personality traits: a cross-cultural comparison of Italian, Polish and Spanish university students. *BMC Psychiatry*, *19*(1), 1-11. https://doi.org/10.1186/s12888-019-2208-2

Haddad, C., Hallit, R., Akel, M., Honein, K., Akiki, M., Kheir, N., Obeid, S., & Hallit, S. (2020). Validation of the Arabic version of the ORTO-15 questionnaire in a sample of the Lebanese population. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *25*(4), 951-960. https://doi.org/10.1007/s40519-019-00710-y

Hajli, M. N. (2014). A study of the impact of social media on consumers. *International Journal of Market Research, 56*(3), 387–404. https://doi.org/10.2501/IJMR-2014-025

Hanganu-Bresch, C. (2020). Orthorexia: Eating right in the context of healthism. *Medical Humanities, 46*(3), 311–322. https://doi.org/10.1136/medhum-2019-011681

Hawkins, L. K., Farrow, C., & Thomas, J. M. (2020). Do perceived norms of social media users' eating habits and preferences predict our own food consumption and BMI?. *Appetite, 149*, 104611. https://doi.org/10.1016/j.appet.2020.104611

Heiss, S., Coffino, J. A., & Hormes, J. M. (2019). What does the ORTO-15 measure? Assessing the construct validity of a common orthorexia nervosa questionnaire in a meat avoiding sample. *Appetite, 135*, 93-99. https://doi.org/10.1016/j.appet.2018.12.042

Jameel, T., Ali, R., & Malik, K. A. (2019). Social Media as an Opinion Formulator: A Study on Implications and Recent Developments. *Proceedings of the International Conference on Computing, Mathematics and Engineering Technologies (ICoMET)*, 1–6. https://doi.org/10.1109/ICOMET.2019.8673509

Johns, R. (2010). *Likert items and scales* [Fact sheet]. Survey Question Bank. https://fac.ksu.edu.sa/sites/default/files/likert11.pdf

Jones, J. M. (2010). *The me in media: A functionalist approach to examining motives to produce within the public space of YouTube.* (Publication No. 3398314) [Doctoral dissertation, University of Minnesota]. ProQuest Dissertations and Theses. http://search.proquest.com/docview/219921526?accountid=14745.

Kang, M., & Cho, C. H. (2020). A Study on Use Motivation, Consumers' Characteristics, and Viewing Satisfaction of Need Fulfillment Video Contents (Vlog/ASMR/Muk-bang). *The Journal of the Korea Contents Association, 20*(1), 73-98. https://doi.org/10.5392/JKCA.2020.20.01.073

Karahanna, E., Xu, S. X., & Zhang, N. (2015). Psychological Ownership Motivation and Use of Social Media. *Journal of Marketing Theory and Practice, 23*(2), 185–207. https://doi.org/10.1080/10696679.2015.1002336

Khan, M. L. (2017). Social media engagement: What motivates user participation and consumption on YouTube? *Computers in Human Behavior, 66*, 236–247. https://doi.org/10.1016/j.chb.2016.09.024

King, E., Wengreen, H., Litchford, A., Bailey, C., Beck, C., Yan, P., Edwards, M., Hudson, R., Kunzler, A., Matthias, H., Peters, C., Petterborg, W., Smith, A., Tinsley, H., & Voorhees, M. (2020). Validating The Düsseldorf Orthorexie Scale (DOS) For Use In Adolescents Aged 14–17. *Current Developments in Nutrition*, *4*(2), 217-217. https://doi.org/10.1093/cdn/nzaa043_068

Koven, N. S., & Abry, A. W. (2015). The clinical basis of orthorexia nervosa: Emerging perspectives. *Neuropsychiatric Disease and Treatment, 11*, 385–394. https://doi.org/10.2147/NDT.S61665

Larson, R., & Csikszentmihalyi, M. (2014). The experience sampling method. In *Flow and the foundations of positive psychology* (pp. 21-34). Springer, Dordrecht.

Leckman, J. F., Denys, D., Simpson, H. B., Mataix-Cols, D., Hollander, E., Saxena, S., Miguel, E. C., Rauch, S. L., Goodman, W. K., Phillips, K. A., & Stein, D. J. (2010). Obsessive–compulsive disorder: a review of the diagnostic criteria and possible subtypes and dimensional specifiers for DSM-V. *Depression and Anxiety*, *27*(6), 507-527. https://doi.org/10.1002/da.20669

Luchman, J. N., Bergstrom, J., & Krulikowski, C. (2014). A motives framework of social media website use: A survey of young Americans. *Computers in Human Behavior, 38*, 136–141. https://doi.org/10.1016/j.chb.2014.05.016

Maj, A. (2018). A healthy mind in a healthy body-Recipes for a healthy living as seen in Polish vlogs. *Qualitative Sociology Review, 14*(2), 116–129. https://doi.org/10.18778/1733-8077.14.2.07

Matikainen, J. (2015). Motivations for content generation in social media. *Participations: Journal of Audience and Reception Studies, 12*(1), 41-58.

McGovern, L., Gaffney, M., & Trimble, T. (2020). The experience of orthorexia from the perspective of recovered orthorexics. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, 1-14. https://doi.org/10.1007/s40519-020-00928-1

Mironova, E. (2016). *Audience's behavior and attitudes towards lifestyle video blogs on Youtube* [Unpublished master's thesis]. Malmö University

Missbach, B., Hinterbuchinger, B., Dreiseitl, V., Zellhofer, S., Kurz, C., & König, J. (2015). When eating right, is measured wrong! A validation and critical examination of the ORTO-15 questionnaire in German. *PloS One, 10*(8), e0135772. https://doi.org/10.1371/journal.pone.0135772

Molyneaux, H., O'Donnell, S., Gibson, K., & Singer, J. (2008). Exploring the gender divide on YouTube: An analysis of the creation and reception of vlogs. *American Communication Journal*, *10*(2), 1-14.

Moroze, R. M., Dunn, T. M., Craig, H. J., Yager, J., Weintraub, P. (2015). Microthinking about micronutrients: a case of transition from obsessions about healthy eating to near-fatal "orthorexia nervosa" and proposed diagnostic criteria. *Psychosomatics, 56*(4), 397-403. https://doi.org/10.1016/j.psym.2014.03.003.

Niedzielski, A., & Kaźmierczak-Wojtaś, N. (2021). Prevalence of Orthorexia Nervosa and Its Diagnostic Tools - A Literature Review. *International Journal of Environmental Research and Public Health, 18*(10), 5488. https://doi.org/10.3390/ijerph18105488

Oksanen, A., Garcia, D., Sirola, A., Näsi, M., Kaakinen, M., Keipi, T., & Räsänen, P. (2015). Pro-anorexia and anti-pro-anorexia videos on YouTube: Sentiment analysis of user responses. *Journal of Medical Internet Research, 17*(11), e256. https://doi.org/10.2196/jmir.5007

Parra-Fernandez, M. L., Rodríguez-Cano, T., Onieva-Zafra, M. D., Perez-Haro, M. J., Casero-Alonso, V., Munoz Camargo, J. C., & Notario-Pacheco, B. (2018). Adaptation and validation of the Spanish version of the ORTO-15 questionnaire for the diagnosis of orthorexia nervosa. *PLoS One*, *13*(1), e0190722. https://doi.org/10.1371/journal.pone.0190722

Perugini, M. L. L., & Solano, A. C. (2020). Normal and Maladaptive Personality Traits as Predictors of Motives for Social Media Use and Its Effects on Well-Being. *Psychological Reports*. https://doi.org/10.1177/0033294120922495

Petersen, A., Craig, M., & Denny, P. (2016). Employing multiple-answer multiple choice questions. *In Proceedings of the ACM Conference on Innovation and Technology in Computer Science Education*. 252-253. http://dx.doi.org/10.1145/2899415.2925503

Poushter, J., Bishop, C., & Chwe, H. (2018). Social media use continues to rise in developing countries but plateaus across developed ones. *Pew Research Center*, *22*, 2-19.

Roberts, J. L., & Leonard, E. W. (2015). What is (and Isn't) Healthism. *Georgia Law Review, 50*(833). https://doi.org/10.2139/ssrn.2646740

Rogoza, R., & Donini, L. M. (2021). Introducing ORTO-R: A revision of ORTO-15: Based on the re-assessment of original data. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, *26*, 887-895. https://doi.org/10.1007/s40519-020-00924-5

Roncero, M., Barrada, J. R., & Perpiñá, C. (2017). Measuring Orthorexia Nervosa: Psychometric Limitations of the ORTO-15. *The Spanish Journal of Psychology*, *20*, 1–9. https://doi.org/10.1017/sjp.2017.36

Ruggiero, T. E. (2000). Uses and Gratifications Theory in the 21st Century. *Mass Communication and Society, 3*(1), 3–37. https://doi.org/10.1207/S15327825MCS0301_02

Sandal, C. (2018). *You are what you eat online. The Phenomenon of mediated eating practices and their underlying moral regimes in Swedish "What I eat in a day" vlogs* [Unpublished master's thesis]. Lund University.

Santarossa, S., & Woodruff, S. J. (2017). #SocialMedia: Exploring the Relationship of Social Networking Sites on Body Image, Self-Esteem, and Eating Disorders. *Social Media + Society, 3*(2). https://doi.org/10.1177/2056305117704407

Sarstedt, M., & Wilczynski, P. (2009). More for less? A comparison of single-item and multi-item measures. *Die Betriebswirtschaft, 69*(2), 211.

Sedgwick, P. (2014). Cross sectional studies: advantages and disadvantages. *BMJ*, *348*. https://doi.org/10.1136/bmj.g2276

Sidani, J. E., Shensa, A., Hoffman, B., Hanmer, J., & Primack, B. A. (2016). The Association between Social Media Use and Eating Concerns among US Young Adults. *Journal of the Academy of Nutrition and Dietetics, 116*(9), 1465–1472. https://doi.org/10.1016/j.jand.2016.03.021

Smit, C. R., Buijs, L., van Woudenberg, T. J., Bevelander, K. E., & Buijzen, M. (2020). The impact of social media influencers on children's dietary behaviors. *Frontiers in Psychology*, *10*, 2975. https://doi.org/10.3389/fpsyg.2019.02975

Stochel, M., Janas-Kozik, M., Zejda, J. E., Hyrnik, J., Jelonek, I., & Siwiec, A. (2015). Validation of ORTO-15 Questionnaire in the group of urban youth aged 15–21. *Psychiatr Pol*, *49*(1), 119-134. https://doi.org/10.12740/PP/25962

Syed-Abdul, S., Fernandez-Luque, L., Jian, W. S., Li, Y. C., Crain, S., Hsu, M. H., Wang, Y. C., Khandregzen, D., Chuluunbaatar, E., Nguyen, P. A., & Liou, D. M. (2013). Misleading health-related information promoted through video-based social media: anorexia on

YouTube. *Journal of Medical Internet Research*, *15*(2), e30. https://doi.org/10.2196/jmir.2237

Tan, T., Kuek, A., Goh, S. E., Lee, E. L., & Kwok, V. (2016). Internet and smartphone application usage in eating disorders: A descriptive study in Singapore. *Asian Journal of Psychiatry*, *19*, 50-55. https://doi.org/10.1016/j.ajp.2015.11.007

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

Valente, M., Renckens, S., Bunders-Aelen, J., & Syurina, E. V. (2021). The #orthorexia community on Instagram. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity*, 1-10. https://doi.org/10.1007/s40519-021-01157-w

Vannucci, A., Simpson, E. G., Gagnon, S., & Ohannessian, C. M. (2020). Social media use and risky behaviors in adolescents: A meta-analysis. *Journal of Adolescence*, *79*, 258–274. https://doi.org/10.1016/j.adolescence.2020.01.014

Vaterlaus, J. M., Patten, E. V., Roche, C., & Young, J. A. (2015). #Gettinghealthy: The perceived influence of social media on young adult health behaviors. *Computers in Human Behavior, 45*, 151–157. https://doi.org/10.1016/j.chb.2014.12.013

Whiting, A., & Williams, D. (2013). Why people use social media: A uses and gratifications approach. *Qualitative Market Research: An International Journal, 16*(4), 362–369. https://doi.org/10.1108/QMR-06-2013-0041

Appendix 1

Start of Block: Informed Consent

Q1 Information sheet for Participation in a Questionnaire - The University of Twente
- Description of the questionnaire and your participation
You are invited to participate in a questionnaire conducted by Marie Geise, Adriana Bülter, Svenja Gabriel and Greta Grewe, supervised by Alexandra Ghita and Teuntje Elfrink. The purpose of this questionnaire is to gain insight into your personal experiences with the use of social media in relation to your bodily and mental health. We would like to know more about the relationship between physical activity, nutrition, social media use and health in the life of university students. The questionnaire will last approximately 25 minutes. The questionnaire will be anonymous so no information can be returned back to your person.
Risks and discomforts
There are no known risks associated with this questionnaire. Potential benefits
There are no known benefits to you that would result from your participation in this questionnaire. This questionnaire 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 questionnaire. 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 questionnaire is voluntary. You may choose not to participate, and you may withdraw your consent to participate at any time. You will not be penalized in any way, in case you decide not to participate or to withdraw from this questionnaire. You are allowed to withdraw the questionnaire at any time.

Q2 Consent Form for Questionnaire about healthy lifestyle
Taking part in the questionnaire
I have read and understood the study information, or it has been read to me. I have been able to ask questions about the study and my questions have been answered to my satisfaction.
I consent voluntarily to be a participant in this questionnaire 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. I understand that taking part in the study involves interpreting my data anonymous.
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 this interview, if any problems arise or if you have questions or concerns about your rights as a participant, please contact Greta Grewe (g.grewe@student.utwente.nl), Alexandra Ghita (alexandra.ghita@utwente.nl), or Teuntje Elfrink (t.r.elfrink@utwente.nl) at the University of Twente.

Q3
I have accurately read out the information sheet and agree to participate voluntarily in this questionnaire.

- ○ Yes (1)
- ○ No (2)

End of Block: Informed Consent

Start of Block: General information

Q4 Please indicate your age in numbers.

_____

Q5 Please indicate your gender.

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary / third gender (3)
- ○ Prefer not to say (4)

Q6 Please indicate your current education.

- ○ Bachelor (1)
- ○ Master (2)
- ○ PhD (3)
- ○ Hogeschool (4)
- ○ Other, namely: (5) _____

Q7 Please indicate your nationality.

_____

Q10 Please indicate on which social media platforms you have an account.

- ☐ Facebook (1)
- ☐ Twitter (2)
- ☐ Instagram (3)
- ☐ Snapchat (4)
- ☐ YouTube (5)
- ☐ None (6)
- ☐ Other, namely: (7) _____

Q11 How much time do you spend on YouTube daily (on average in minutes)?

_____

Q12 Please indicate which kind content (i.e. video, posts) you watch on social media platforms.

- [ ] Food Vlogs (e.g. Food Diary, What I eat in a day, Full week of eating) (1)
- [ ] Recipe videos (2)
- [ ] Recipe posts (3)
- [ ] Food posts (i.e. someone posts his lunch) (4)
- [ ] Videos about physical activity (i.e. exercising) (5)
- [ ] Posts about physical activity (i.e. exercising) (6)
- [ ] Posts about nutrition (i.e. recipes, vitamins) (7)
- [ ] Videos about nutrition (i.e. recipes, vitamins) (8)
- [ ] Dieting videos (i.e. weight loss journey, meal plan) (9)
- [ ] Dieting posts (i.e. meal plan to lose weight) (10)
- [ ] Videos about body image / appearance (i.e. body transformation) (11)
- [ ] Posts about body image / appearance (i.e. body transformation) (12)
- [ ] Videos about health in general (13)
- [ ] Posts about health in general (14)
- [ ] Content (i.e. videos / posts) of nutrition influencer (15)
- [ ] Content (i.e. videos / posts) of fitness influencer (16)
- [ ] None of the above (17)

End of Block: General information

Start of Block: Social Media Motives Scale

Q13 The next part focuses on social media. You will be presented with several statements about your motives for social media use. Please indicate to what extent you agree or diagree.

	Strongly Disagree (1)	Disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
I use social media to know how to do something. (1)	○	○	○	○	○
Social media improves my understanding of the topics. (2)	○	○	○	○	○
I use social media to find out more about something or someone. (3)	○	○	○	○	○
I use social media to search for professional experts. (4)	○	○	○	○	○
Social media helps me to improve my academic success. (5)	○	○	○	○	○
I use social media to provide updates about major events and fun things in my life. (6)	○	○	○	○	○
I use social media to keep in touch with others. (7)	○	○	○	○	○

I use social media because my friends do. (8)	○	○	○	○	○
I use social media to involve with what's going on with others. (9)	○	○	○	○	○
I use social media to connect with people who share similar values, hobbies, or interests. (10)	○	○	○	○	○
I use social media to express my opinion and character. (11)	○	○	○	○	○
I use social media to express my talent and creativity. (12)	○	○	○	○	○
I desire my posts to be viewed by a bigger audience as much as possible. (13)	○	○	○	○	○
I use social media for sharing information. (14)	○	○	○	○	○

When producing social media content, I can use the kind of information, skills, or capacities I wouldn't be using otherwise. (15)	○	○	○	○	○
I use social media to have fun. (16)	○	○	○	○	○
I use social media to relax. (17)	○	○	○	○	○
I use social media when I have nothing else to do. (18)	○	○	○	○	○
I use social media to chatter and share gossip. (19)	○	○	○	○	○
I use social media to impress. (20)	○	○	○	○	○
I joined social media to enhance my social life. (21)	○	○	○	○	○
I want to become famous by using social media. (22)	○	○	○	○	○

I use social media because I seem to have more prestige than those who do not. (23)	○	○	○	○	○
I use social media to reveal my presence. (24)	○	○	○	○	○
Audience's responses, such as share, like, and comments, increase my engagement in social media. (25)	○	○	○	○	○
I use social media because it is free and available. (26)	○	○	○	○	○
I use social media because it is easier. (27)	○	○	○	○	○
I use social media because others can answer anytime. (28)	○	○	○	○	○
In social media, I can get to decide what to produce and where to do so independently. (29)	○	○	○	○	○

Social media enables me to do things on my pace. (30)	○	○	○	○	○

End of Block: Social Media Motives Scale

Start of Block: ORTO-15

Q14 In the next part you will be asked several questions about your eating behaviour.

Q15 When eating, do you pay attention to the calories of the food?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q16 When you go in a food shop do you feel confused?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q17 In the last 3 months, did the thought of food worry you?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q18 Are your eating choices conditioned by your worry about your health status?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q19 Is the taste of food more important than the quality when you evaluate food?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q20 Are you willing to spend more money to have healthier food?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q21 Does the thought about food worry you for more than three hours a day?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q22 Do you allow yourself any eating transgressions?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q23 Do you think your mood affects your eating behavior?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q24 Do you think that the conviction to eat only healthy food increases self-esteem?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q25 Do you think that eating healthy food changes your life-style (frequency of eating out, friends, ...)?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q26 Do you think that consuming healthy food may improve your appearance?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q27 Do you feel guilty when transgressing?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q28 Do you think that on the market there is also unhealthy food?

- ○ Always (1)
- ○ Often (2)
- ○ Sometimes (3)
- ○ Never (4)

Q29 At present, are you alone when having meals?

- Always (1)
- Often (2)
- Sometimes (3)
- Never (4)

End of Block: ORTO-15

Start of Block: Outcome

Q30 This is the end of the questionnaire. Thank you for your participation!

If you have any questions please let us know via:

g.grewe@student.utwente.nl, alexandra.ghita@utwente.nl, or t.r.elfrink@utwente.nl

End of Block: Outcome
