Understanding Perceived Characteristics and Causes of Orthorexia Nervosa in Online Communities—A Reddit Analysis

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Abstract

The present study analysed individual experiences of orthorexia nervosa (ON), a term commonly associated with obsessive health behaviors. With no universal definition available in research or practice, this study aimed to analyse six months of publicly available Reddit data to identify common characteristics and perceived causes of ON as reported in eating disorder- (ED) and diet-related subreddits. A Python code was used to extract comments from a publicly available Reddit data archive. To explore themes for each category of subreddit, a text-mining approach was combined with thematic analysis within a social constructionist framework. In both subreddit categories, the manifestation of ON was conceptualized in the context of shifting ED expressions and associated with the perception of food as a threat as well as the pursuit of superiority. In ED-subreddits, commenters discussed ON as a safety mechanism for health anxieties, the role of the body as visualising ON, and ON's role within a proactive selfcare culture. Diet-related subreddit themes encompassed the conceptualization of ON as health perfectionism, ON's underlying mental health concerns, and ON pathology as the result of problematic norms. The analysis of 246 online comments revealed a wide scope of ON conceptualizations and highlighted the need for a coherent diagnostic model of ON, which takes into account sociocultural as well as individual factors.

Keywords: orthorexia; Reddit; social media; eating disorders; diet

Introduction

Orthorexia nervosa (ON) is a term first introduced by Bratman (1997) to describe a fixation on eating only foods believed to be healthy (Bratman & Knight, 2000), which eventually affects individuals' emotional wellbeing (e.g., feelings of intense distress when not being able to adhere to dietary rules), social functioning (e.g., difficulties participating in social eating), and overall mental and physical health (e.g., excessive preoccupation with foods, malnutrition). Despite multiple efforts to specify potential diagnostic criteria for ON (Barthels et al., 2015; Dunn & Bratman, 2016; Moroze et al., 2015; Setnick, 2013), a universal definition is still disputed (Cena et al., 2019; Galfano et al., 2022). Based on its preliminary conceptualization approaches, however, ON has been linked to rigid food rules (e.g., Zickgraf, 2020), perfectionism (Oberle et al., 2017), restrained eating behaviours (e.g., Barthels et al., 2018), and food choices that align with one's definition of health, such as organic, additive-free, low-fat, or environmentally friendly foods (Cheshire et al., 2020).

Due to its association with both eating disorder (ED; e.g., restrictive food avoidance, ego-syntonic thoughts) and obsessive-compulsive symptoms (e.g., intrusive thoughts, obsessive-compulsive meal preparation), ON has previously been conceptualized as both part of the ED and the obsessive-compulsive disorder (OCD) spectrum (Costa et al., 2017; Koven & Abry, 2015; Zagaria et al., 2022). However, the most commonly adopted conceptualizations of ON appear to be largely related to ED symptoms (e.g., Bartel et al., 2020; Strahler et al., 2018) and consider a relationship between ON and a range of different health behaviors and diets (Bratman, 2017). In this sense, behaviors associated with ON are commonly tied to sociocultural health trends, such as an increasing focus on individual responsibility for health (Håman et al., 2016), consumer culture (e.g., the value of organic, home-made food; Håman et al., 2015) and associating a certain weight with a specific health status (Bratman, 2017).

Bratman and Knight (2000) describe the motivations behind obsessive healthy eating as complex, though usually related to strict self-control. Therefore, any dietary theory could be taken to the extreme, leading to disordered eating behaviors (i.e., abnormal eating patterns) and the development of excessive health concerns. The link between specific (restricted) dietary behaviors and ON, especially veganism and vegetarianism, has been investigated by previous research utilizing different diagnostic tools (Barthels et al., 2018, 2020; Brytek-Matera et al., 2019; Çiçekoğlu & Tunçay, 2018; Heiss et al., 2019; Parra-Fernández et al., 2020). The mixed findings of these studies indicate that problematic dietary restrictions are related to the motivations that underlie dietary choices, rather than the diets per se (Barthels et al., 2020). However, veganism and vegetarianism have been found to be positively associated with ED pathology (e.g., Paslakis et al., 2020), making further investigations necessary.

Interestingly, in a recent interview study by Valente, Syurina, and colleagues (2020) half of the respondents who self-identified as "healthy eaters" followed a vegan diet and perceptions of healthy eating included environmental and animal welfare considerations. Other qualitative studies found that the onset of ON behaviors can be linked to starting a new diet (McGovern et al., 2021) and dietary recommendations (Valente, Brenner, et al., 2020) but that characteristics of ON are not limited to a specific type of diet (Cheshire et al., 2020). Considering the relationship between ON and dietary restrictions, ED symptoms (e.g., Strahler et al., 2018) and sociocultural health ideals (e.g., Syurina et al., 2018), individual motivations and personal experiences of ON in the context of specific diets need to be further explored. Individual accounts are important to improve our understanding of how mental health distress affects the individual, their environment and daily life (Banyard, 2000; LeCroy & Holschuh, 2012). They also make us aware of the complexity of people's experiences as well as "[…] prevailing cultural norms of emotionality, behaviour and morality" (Cromby et al., 2013, p. 9) that shape individual experiences.

A qualitative investigation of ON-related attitudes and behaviors in a US-context identified the availability of information in the media as influential for food choices of those who reported to be overly concerned about their health (White et al., 2021). Additionally, "internet culture" and (social) media "performances" have been linked to the onset and expression of excessive health behaviors (Hanganu-Bresch, 2020). Media platforms appear to reproduce some of the sociocultural trends which influence people's understanding of health and healthy bodies (Wiklund et al., 2019). Previous research investigating the manifestation of EDs have shown that online communities constitute a valuable source of information to better understand the complexity of ED aetiologies and maintenance factors. This includes investigations of ED conceptualizations and how they relate to recovery resistance (Roberts Strife & Rickard, 2011), the construction of ED identities in online group interactions (Gavin et al., 2012), and the analysis of online narratives illustrating the manifestation of EDs in men (Malova & Dunleavy, 2022).

So far, few studies have addressed how online communities represent the concept of ON. Greville-Harris et al. (2020) conducted a qualitative analysis of 40 orthorexia-related blog posts to investigate "naturalistic" accounts of ON. The authors did not explicitly refer to online narratives, but used thematic analysis to investigate how ON as a form of disordered eating was developed and maintained by relevant bloggers, thereby illustrating motivations (e.g., a "desire to do right"), social influences (e.g., "unhelpful health claims") and causal mechanisms leading to ON (a "punishing drive for perfection and control"). Cinquegrani and Brown's (2018) internet ethnography focused on pro-orthorexia forums and blog posts to analyze ON "cyber stories". Describing ON as a "lifestyle syndrome", the authors explored narratives of the self and the body within a sociocultural framework, addressing both a culture of healthism as well as individuals' efforts to optimize their bodies and to navigate health risks.

The present study aimed to build on previous findings by investigating both lifestyle factors (in this case specific dietary ideals) and ED behaviors in the context of ON online narratives on Reddit, a popular social media forum and one of the largest discussion-based platforms online (Bohrer et al., 2020; Hwang et al., 2020). In contrast to

person-centered blogs, Reddit posts allow for an active knowledge exchange between anonymous subscribers, reflecting unique opportunities for democratic participation in virtual communities (e.g., Rheingold, 1994).

Furthermore, subreddits represent communities with shared interests and have been shown to exhibit community-specific language styles (Tran & Ostendorf, 2016) and unique vocabulary (Gkotsis et al., 2016). As it is still unclear how ON relates to specific dietary restrictions, a separate analysis of two categories of subreddits was conducted for the present study to explore lived experiences and understandings of ON, as well as the perspectives of those hypothesized to have a higher risk of developing ON (e.g., those adhering to specific restrictive diets). This approach considers the subreddit community context as an environment with its own norms and culture (cf. Proferes et al., 2021) and allows for the comparison of ON conceptualizations in the context of eating pathologies versus dietary lifestyle choices.

The current study draws on the methodological approach of McCaig et al. (2018, 2020), who used text-mining and qualitative approaches to investigate the relationship between fitness tracker usage and disordered eating behaviors. Previous studies have used Reddit discussion forums to analyze how recovery is defined in the context of ED-related online communities (Bohrer et al., 2020), how ED symptoms are presented in pro-eating-disorder subreddits (Sowles et al., 2018), and how frequently emotional eating behaviors are discussed in online posts (Hwang et al., 2020). The objective of the present study was to explore individual experiences and conceptualizations of ON regarding characteristics and underlying causes, as outlined in ED- and diet-related subreddit communities, considering the online context (i.e., discussions around EDs versus discussions around specific diets) in which comments were posted. The two communities were chosen as their topic foci have been previously linked to ON behaviors, as outlined above.

Methods

The present study combined text-mining (the extraction of patterns from large databases of natural language text; cf. Hearst, 2003), with a qualitative analysis. Reddit comments (in response to certain posts), not the original posts, were publicly available on https://files.pushshift.io/reddit/submissions/ up to August 2019. The archive only includes comments and submissions, as it was created to facilitate comment searches. For the present study, the most recently available six months of Reddit data (April 2019–August 2019) were extracted from the Reddit comments corpus archive using an adapted Python code (available upon request) as published in McCaig et al. (2018). A timeframe of six months was chosen to restrict the quantity of data for analysis while simultaneously allowing for a variety of comments to be analyzed.

Corpus Selection

To identify relevant subreddit communities, "orthorexia" was used as a search term on https://www.reddit.com/ and all search results were displayed by "Relevance". Out of the fifteen most relevant subreddits, one was private (r/EDRecovery), one consisted only of humorous messages embedded in videos and images ("memes"; r/EDanonymemes) and two had no "orthorexia" comments posted in the six months specified (r/Orthorexia, r/Paleo). Of the remaining 11 subreddits, four used a version of the term "eating disorder" in the title and three specified a specific diet as their community name. The rest of the subreddits focused on general topic areas (r/todayilearned, r/Health, r/psychology) or could not be clearly placed as either diet- or ED-related (r/fatlogic). Based on these considerations, the following seven subreddits were chosen for the present analysis: r/EDAnonymous, r/EatingDisorders, r/fuckeatingdisorders and r/eating_disorders (ED-related subreddits); r/vegan, r/PlantBasedDiet and r/zerocarb (diet-related subreddits). The comments of all seven subreddits were extracted separately to allow for comparisons between them.

Data Extraction

Once specific subreddit communities were defined, the adapted code allowed for the extraction of the following information: when the comment was posted (month, year), an author identifier (a number-letter combination, not a username), the subreddit name, a thread identifier, and the comment text, converted from a ZST to a CSV file. Decompressing the data into a CSV file made it possible to access the comment texts in Excel. URL links and deleted comments were not extracted.

Data Analysis

In total, $N = 657,240$ comments were extracted from all seven subreddits within the specified timeframe (April and August 2019). All extracted comments posted on the selected subreddits were searched for the term "orthorexia" using Excel. Only comments that explicitly mentioned "orthorexia" ($N = 273$; $n = 168$ in ED subreddits, $n = 105$ in diet-related subreddits) were then imported into NVivo for further analysis. Of these, $n = 27$ comments could not be analysed as they did not include enough/relevant information for the present study or could not be interpreted without the original post (e.g., "have you heard of orthorexia?",) resulting in a total of 71 doubled-spaced pages (1,904 lines) of comments to be analyzed. Due to the high volume of data, all other comments were not screened for further information. ED-related and diet-related subreddits were uploaded in two different documents and analyzed separately.

An inductive thematic analysis (TA) based on Braun and Clarke's (2006) approach was employed by the first author to categorize characteristics and perceived causes of ON in relevant themes. TA was chosen due to the nature of the data (e.g., heterogenous sample), the research question (e.g., focus on patterns across comments), and as it allows for a social constructionist framework that conceptualizes a psychological phenomenon as more than just pathology, taking into account the social and cultural context in which disorders are identified (Braun & Clarke, 2021; Burr, 2015). As outlined in the introduction, topic-related subreddit communities (ED subreddits versus diet-related subreddits) were considered socioculturally distinct spaces within the wider sociocultural context. The first author acknowledges that this theoretical underpinning is highly influenced by her background in both psychology and social anthropology and was chosen based on the assumption that ON is currently not sufficiently defined to be differentiated from other (maladaptive) behaviors. The analysis approach involved an iterative process, which will briefly be illustrated in the following. All main analyses were carried out by the first author who had undertaken training in qualitative data analysis.

First, the familiarization with the data involved note taking (memo writing) while reading through comments, considering the online context (e.g., anonymity of commenters, lack of contextual information regarding commenters' background) as well as the overall theme of the subreddit (e.g., the discussion of lived ED experiences in ED subreddits versus the justification of commenters' ethical dietary beliefs in diet-related subreddits). Even though not a typical approach in thematic analysis (cf. Braun & Clarke, 2021), line-by-line coding (assigning detailed descriptive codes to each comment line) was applied within the first coding cycle, as chosen comments provided little or no information regarding commenters' background and previous experiences with line-by-line coding facilitating a "discovery" focus (Charmaz, 2014) for an already selective sample (all comments included the term "orthorexia"). Once initial patterns across the data set were identified (cf. Braun & Clarke, 2006), a concept coding approach (focused on the broader meaning of coded data; cf. Saldaña, 2021) was applied to all data units that were considered meaningful to the research question.

Next, codes were used to generate themes based on the creation of a series of evolving thematic maps. These themes were reviewed under consideration of both individual coded data extracts and the data set as a whole. Once a candidate thematic map was identified, theme names were formulated and revised. Theme descriptions were written to further reflect on the meaning of each theme. The final thematic map and written report was presented to the research team, not to check for reliability (cf. Braun & Clarke, 2013) but to share insights and to discuss the coherence of the analytical process and outcomes. These reflections led to further revisions of the thematic map and the final report. The final nine themes will be illustrated within the results section.

Ethical Considerations

Reddit allows commenters full anonymity and all comments of non-private subreddit communities are publicly available. Yet, the British Psychological Society (BPS) remarks that internet-mediated research requires additional ethical considerations concerning the distinction between public/private domains, confidentiality, copyright, and consent (BPS, 2017). In the present study, Reddit data from public, not private, subreddits were downloaded to a local server and anonymized during the extraction process. All identifiable information was excluded from this analysis (e.g., usernames, references to personal information) and all presented quotations were paraphrased to prevent readers from searching original posts (cf. Smedley & Coulson, 2021). The focus of this project was on the cumulative information available in different online discussion forums. Individual commenters were therefore not identified. As a secondary data analysis, there was no opportunity for commenters to provide consent. However, Reddit has clear privacy policy guidelines, which specify that all content posted on public forums is accessible to

third parties and everyone posting and commenting on a public forum should take this into consideration before posting any comments (Reddit, Inc., 2022). Reddit's ownership of the data is acknowledged by citing it as the data source for all comments. Ethical approval was provided by the University of Edinburgh Research Ethics Committee.

Results

In total, *N* = 273 comments included the term "orthorexia" across the seven subreddits and *N* = 246 comments from 170 unique contributors included information that was relevant to this study. Due to the heterogeneous nature of the data set, themes regarding causes and characteristics of ON were developed based on a variety of perspectives. Both subreddit communities provided a different context for discussions, information sharing, and support seeking behaviors.

Figure 1. *Thematic Map.*

Eating Disorder-related Subreddits

ON as a Safety Mechanism for Health Anxieties

The Body as the Visual Manifestation of ON

ON Within a Proactive Selfcare Culture

The Manifestation of ON in Shifting ED Expressions

ON and the Perception of Food as a Threat

ON as the Pursuit of Superiority

Diet-related Subreddits

ON as Health Perfectionism

ON's Underlying Mental Health Concerns

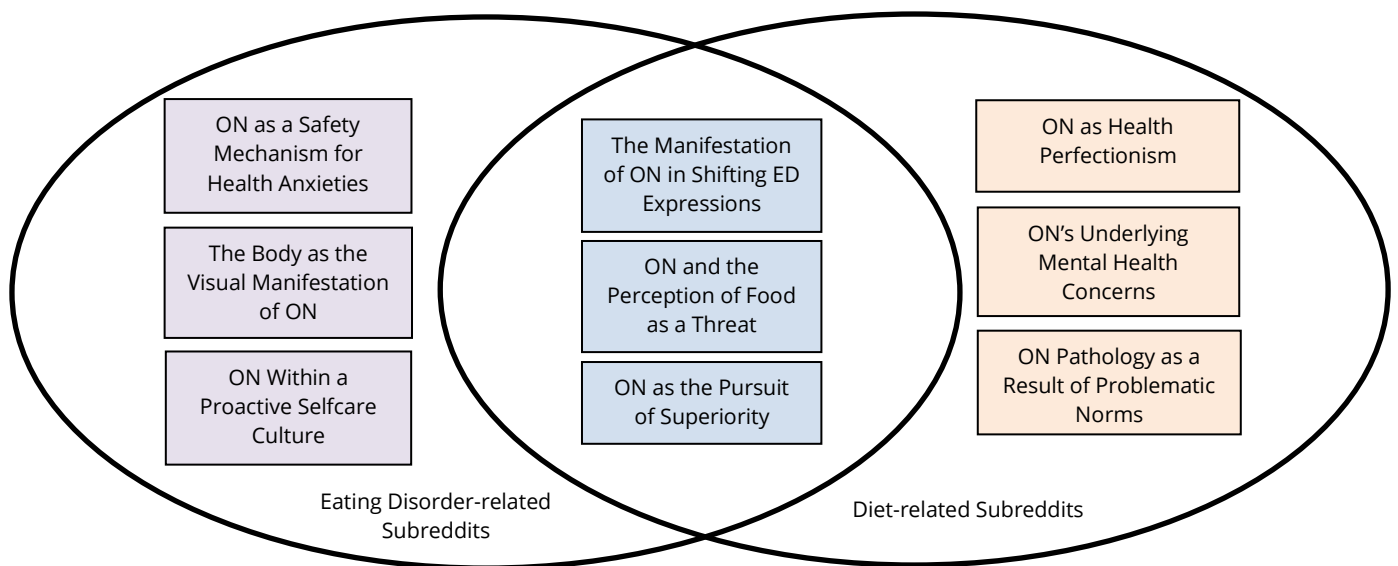ON Pathology as a Result of Problematic Norms

Figure 1 gives an overview of all themes, highlighting the commonalties and differences between themes identified in ED- and diet-related subreddits, with Table 1 providing additional theme descriptions. Overall, the comparison of two subreddit communities allowed for an investigation of a variety of sociocultural as well as individual influences on ON conceptualizations.

Common Themes Identified in Both ED- and Diet-Related Subreddits

The Manifestation of ON in Shifting ED Expressions

In both subreddit communities, ON was often defined in relation to Anorexia Nervosa (AN), Bulimia Nervosa (BN) and Binge Eating Disorder (BED), usually describing ON as less severe or less physically impairing. These perceptions are in line with a medical model approach, which emphasizes the role of physical impairments for the conceptualization of mental health concerns. Most commonly, Reddit commenters described ON as developing in ED recovery. However, the extent to which this was seen as a problematic development varied between commenters: "Based on my experience, recovering but still staying thin is only possible with a tad orthorexia. It is the lesser of two evils. At least this one is accepted by society. The impairment is only mental" (r/EDAnonymous). Similarly: "[...] you might have to diverge from your whole foods diet, while still remaining vegan. We both know that recovering from an eating disorder means you can't be so rigorous. Do not develop orthorexia" (r/PlantBasedDiet).

Whether it was the adherence to a specific diet or weight control measures, a lack of flexibility and no tolerance for transgressions were seen as problematic. Multiple comments mentioned experiencing self-loathing, panic attacks, or the need to purge when not being able to adhere to strict dietary rules, which could reflect feelings of self-blame for not meeting certain self-imposed or internalized dietary standards. Other commenters saw ON as

an opportunity for self-deception, especially during recovery. Even though specific behaviors and reported motivations might appear less disordered, they were perceived as a continuation of other EDs: "People are outstanding at lying and even more so to ourselves. We can only convince ourselves we are doing better before our disorder manifests itself somewhere else: orthorexia, over-exercise… I applaud those who do recover" (r/EDAnonymous).

Table 1. *Illustration of Themes and Theme Descriptions.*

	Identified Themes	Theme Description
Common Themes	The Manifestation of ON in Shifting ED Expressions	ON is conceptualized as entangled with other EDs, both in terms of the stages of EDs, as well as the sociocultural context in which they are expressed
	ON and the Perception of Food as a Threat	ON is presented as the result of food anxieties and perceived dichotomies regarding the safety of foods
	ON as the Pursuit of Superiority	Up until the point restrictions escalate, ON behaviors are discussed as superior, reflecting societal values around discipline, morality, and purity
ED-Subreddit Specific Themes	ON as a Safety Mechanism for Health Anxieties	ON is conceptualized as a response to specific (feared) health conditions, intolerances, or health beliefs
	The Body as the Visual Manifestation of ON	ON is inextricably linked to the body, both in terms of ON motivations and bodily effects
	ON Within a Proactive Selfcare Culture	Societal pressures and expectations around proactive self-care are discussed as generating and validating ON behaviors
Diet-Subreddit Specific Themes	ON as Health Perfectionism	ON is associated with aspirations for perfect health, which is perceived as the ultimate achievement
	ON's Underlying Mental Health Concerns	ON is conceptualized as obsessive practice and a response to anxiety in order to differentiate it from self-chosen dietary ideals
	ON Pathology as a Result of Problematic Norms	ON is discussed as pathologizing individual choices to respond to obesity risk, misinformation, and current food availability

Multiple commenters described so-called "health food binges" with fruits, raw vegetables, peanut butter, or pulses (e.g., lentils, beans, or chickpeas), illustrating how food choices for ED behaviours were influenced by common conceptualizations on what constitutes "healthy" foods. Categorizing food as exclusively "bad" or "healthy" created unattainable expectations of eating either rigorously "healthy" or, when "cheating" or forced to eat "unhealthy" foods, experiencing intense feelings of failure. Often commenters mentioned an "all or nothing" attitude, which mirrored the dichotomy of food categorizations: "I'm like a swing, I swing back and forth between BED and orthorexia. Usually, my orthorexia appears as soon as I try to control my BED. All or nothing" (r/EDAnonymous).

Calorie restrictions and a problematic body image were seen as decisive characteristics of ON, which exposed certain health behaviors as disordered. Instagram portrayals of supposedly recovered users were called out for supporting this self-deceptive behavior, which could still reinforce unattainable ideals:

> "[...] it seems like on social media recovery is just an euphemism for either orthorexia or BED. I'm not judging anybody who is using their profiles for support and motivation to recover but let's just call it what it is: you're still ruled by food, exercise, and body image, just in a different direction" (r/EDAnonymous).

Especially "healthy eating" advice given to those with a restrictive ED were seen as problematic, facilitating shifting expressions of ED behaviours, even if advice was well-intentioned and referred to socially accepted health behaviors:

> [...] "some of the comments about giving your friend more control by letting her count calories, [...] telling her to eat healthy foods, or exercise, are probably well-intentioned but as someone who had an eating disorder for years, that could just facilitate her transition from anorexia or bulimia to orthorexia. She could just shift the obsession from restricting to eating extremely healthy and exercising excessively" (r/EatingDisorders).

Underlying problems, such as a need for control and an obsession with regulating one's food intake were seen as common features amongst ON and other EDs. However, ON behaviors were described as restrictions specifically targeting "unhealthy" foods (also described as "junk food" or "processed foods") that were associated with specific fears (e.g., heightened blood pressure, diabetes, "unhealthy" weight gain, "unhealthy" calorie intake). These fears reflected conceptions around dietary intake being a health behavior that can easily be controlled. AN and ON were often mentioned together, as co-occurring or alternating, with ON being the result of a "shifting obsession". Fluctuating between different EDs was seen as a cyclical process: "Professional Anorexics like myself tend to cycle between different behaviors. Orthorexia and binge eating are common, which allows the body to recompense before relapsing into starvation again. For me this cycle has been repeating itself for a long time" (r/EDAnonymous).

In general, ON was described as less disordered, being referred to as "healthier" or "not even a real problem" (r/EDAnonymous). Especially when compared to severe starvation or physical side effects from continuous purging behaviors, ON was seen as less destructive. Due to the focus on mental distress, ON was described as a problem that is more difficult to identify (and as a result potentially more difficult to conceptualize), as symptoms were perceived as not fitting the description of a stereotypical ED.

> "It's not about a body type, it is a mental thing. That's why I thought for way too long that there was nothing wrong with me. Because I wasn't underweight. But my mother said I have a problem. When I was googling 'eating disorders', I found orthorexia nervosa, and all the symptoms point to what I do and how I live my everyday life [...]" (r/EDAnonymous).

ON and the Perception of Food as a Threat

Another theme within both subreddit communities referred to the way in which foods were associated with hazards. A fear of certain foods and not being able to adhere to a self-proclaimed "healthy" diet, was described as leading to extreme mental distress and compensatory behaviors, such as purging, extreme fasts or over-exercising:

> "I was terrified of carbs and sugars until I realized that categorizing those as unhealthy was setting myself up for failure. If I have safe foods that means I have an infinite number of unsafe foods that, if consumed in any amount, I would feel like I binged and would want to purge" (r/EDAnonymous).

Categorizing foods as either "safe" or "fear" foods was reported as a common characteristic for all EDs, however food anxieties were emphasized specifically for ON as they were associated with the problem's onset:

> "I was essentially taking supplements, protein powder and what I believed to be safe vegetables. I assured myself that I wasn't developing a disorder, just eating like a healthy person should. I thought I was taking control over my nutrition and improve my life. As it happens, I was only depriving myself of food and creating intense fears surrounding food" (r/fuckeatingdisorders).

Viewing specific foods as unhealthy to the point of being dangerous, was seen as harmful and causing unnecessary mental distress in both subreddit communities:

> "[...] I think moderation is crucial and don't really agree with considering things bad to the point that consuming say meat, eggs, refined sugar/oil once in a while will do harm. They aren't poisons after all.

There's a certain point where healthy eating becomes so stressful and restrictive that it's incompatible with living life. That's orthorexia" (r/PlantBasedDiet).

ON as the Pursuit of Superiority

Beyond ingredients and nutritional values, food choices in ON were associated with the way the food was grown, harvested, and traded. "Healthiness" was therefore not only defined in terms of nutrition, but also in terms of naturalness, morality, and care. Some commenters described how their diet, and thereby they themselves, felt superior and more disciplined if they never ate any of the foods they categorized as 'bad'. In this context, superiority referred to other people, a previous version of themselves, or to other dietary approaches: "I like choosing the healthiest options just to prove to myself over and over again that I have a lot of self-control. My orthorexia won't permit junk food [...]" (r/EDAnonymous).

The onset of ON was frequently linked to radical changes in dietary behaviors in both subreddit communities, especially if one had experiences of disordered eating in the past. Even though adopting a vegan diet in recovery was seen by many as a risk factor for developing ON, being vegan per se was only described as harmful if adopted "for the wrong reasons" (e.g., not environmental, or ethical motivations):

"I have definitely been very conscious of how some use veganism as a pretext to maintain their eating disorder. I believe people who start this diet for ED-reasons would mostly be considered as belonging to the orthorexia category though, as they're usually the most extreme in terms of food purity. You don't really see this amongst vegans who will eat vegan junk that can be easily mistaken for the animal product equivalent" (r/fuckeatingdisorders).

Especially diets advertised for their health benefits, such as intermittent fasting and "clean eating", were associated with "healthier" restrictions.

"When I realized that my thinking was disordered, I nearly believed I was better off that I had an obsession with clean eating. I just didn't notice how much weight I was losing [...] and how socially isolated I was making myself" (r/PlantBasedDiet).

Commonly, problematic behaviors were identified if restrictions increased over time. Restricting fat, sugar, oil and "processed" foods was typically mentioned in connection with the onset of ON and endeavors to eat "better".

ED-Subreddit Specific Themes

ON as a Safety Mechanism for Health Anxieties

In line with current public health guidelines, many commenters in ED-related subreddits assumed a direct relationship between their diet and their health status, which often caused distress if they experienced any physical symptoms or if they could not comply with their dietary restrictions:

"I broke down crying in my doctor's office when I had an elevated blood pressure reading. Since my heart health is at risk, I'm still sort of trying to lose weight, but as soon as I started describing my restricting and all my fear foods to her, she referred to it as what it is: orthorexia" (r/EDAnonymous).

Public health messages around the effects of certain foods were often internalized to an extreme extent. Existing health conditions and a family history of health issues were reasons to use food as a means to prevent illness. Even if food intolerances made it necessary to cut out some foods from one's diet, eliminating progressively more foods was seen as considerably affecting one's quality of life:

"[...] I was recovered [from an ED], then I got diagnosed with coeliac disease. I have to avoid a lot of items because of this diagnosis, and I can't eat at most restaurants. Once I got used to eating gluten free, I was inspired to try cutting other unhealthy things out of my life. I have a considerable family history of diabetes, so I cut out added sugar, [...] carbs, then fruit, dairy, [...], and meat out of fear of developing diabetes myself, and eventually found myself on a very restricted vegan-keto diet and calorie counting once more. The food I eat [...] pretty much all tastes awful but it's healthy" (r/fuckeatingdisorder).

Health-related fears of certain foods were either related to their perceived "unhealthiness" or contamination potential (e.g., a fear of certain packaging materials or chemicals), especially if concerns were based on health topics frequently discussed in the media, such as carcinogenic risks:

"I have orthorexia. I just can't get rid of the paranoia around cancer, it scares me whenever I come into contact with clingfilm. I can't even touch it without feeling contaminated. I avoid anything pre-packaged, so I buy all my fruit and veg without it [...]" (r/EDAnonymous).

"I cried last week when I unintentionally ate an apple that wasn't organic because, oh yeah, orthorexia isn't real... similarly, that time I had crackers, and the hydrogenated oils and trans-fat caused me to experience health anxiety for a week...." (r/EDAnonymous).

The Body as the Visual Manifestation of ON

In the same way that health is commonly tied to a certain body weight and shape, so was ON in ED-subreddits. "Clean" foods were associated with "better" calories and calorie restrictions were associated with trying to be healthy. However, over-exercise and excessive restrictions often led to extensive weight-loss, mental distress, or constraints in social situations: "I developed orthorexia after using my fitness pal for a year. [...] I most certainly did not eat the correct number of calories I should've been eating" (r/EatingDisorders).

The pathology of ON was tied to the extreme restrictions accompanying supposedly "healthy" diets. Consequences of these restrictions were described as either intended or unintended weight loss as well as malnutrition. Weight was thereby cause for and weight loss consequence of ON for some commenters:

"Perhaps something set it off, but one day I woke up and found that I was unable to push myself to eat some of the things I used to. I was disgusted by myself and disgusted by the foods that had caused me to gain the weight I did. From there, things spiralled quite quickly, possibly one or two months" (r/fuckeatingdisorders).

The "healthiness" of certain diets was furthermore questioned due to their extremism and associated with nutritional deficiencies. Especially opaque reasons for avoiding certain foods were considered as causing unnecessary dietary restrictions:

"They [extreme vegan subreddit communities] are absolutely ridiculous, claiming that orthorexia isn't real. But avoiding all processed foods at all costs is about being healthy? [...] Also, to me, processed strikes me as an arbitrary distinction. Like what even constitutes a process? [...] They intentionally make food taste bland, so you won't want to eat it and simultaneously give yourself low sodium and possibly an iodine deficiency in the process. That sounds healthy..." (r/EDAnonymous).

Malnutrition was therefore seen as the result of favouring discipline and rules over the enjoyment of food.

ON Within a Proactive Selfcare Culture

Societal ideals regarding "perfect health" and how this is reflected in "healthy bodies" was central to many comments in ED subreddits, while ON was often conceptualized within the context of our current health and wellness culture: "I think orthorexia is only spoken about because of our current obsession with wellness" (r/fuckeatingdisorders). Commenters described ON as "cool" and "acceptable" ED, which was reinforced by positive feedback from others: "People often complement my diet, which makes it very challenging. It looks very healthy and the health concerns that are driving this behavior are justified, but the behavior itself is not. Orthorexia sucks" (r/fuckeatingdisorders).

In this sense, ON was associated with changing pressures for an ideal body reflecting changing societal ideals: "Wanting to be stronger simply replaces wanting to be skinny, since our current society dictates that being more muscular is the new desirable body type" (r/EatingDisorders). Body image concerns were thereby part of ON's conceptualization, even though less obviously so, as they were associated with more than just appearance. Being "strong" can refer to a body as well as an attitude, which makes it harder to identify as related to bodily ideals. However, the pressure to change one's body to comply with societal ideals was perceived as equally prevalent in ON. Eating "better" food (e.g., organic, fresh, "clean") and improving one's fitness (e.g., exercising more, using fitness trackers) were mentioned when describing the onset of ON. Two commenters described ON as an improvement compared to previous mental health conditions (BN and addiction), which allowed them to be more energetic and to look better and younger:

"I try to follow CRON [Calorie Restriction with Optimal Nutrition] as best as I can, given my dietary restrictions/food intolerances, in the hopes of preventing aging. Since I've been abusing substances for so long, I truly see my orthorexia as selfcare. My skin looks so much better, and people frequently

assume that I'm younger than I am, even though it is difficult to say how much of it is connected to quitting using vs. my improved diet […]" (r/EDAnonymous).

Describing ON as "selfcare" shows that restrictions and discipline were seen as necessary to look after oneself. ON was thereby associated with "optimal nutrition", which required proactive research and vigilance. Yet, being confronted with various theories of how to eat "better" caused anxiety and self-doubt for some:

> "I struggle with orthorexia and hearing that people are avoiding dairy kind of scares me because I eat so much of it, especially as it's not low in calories. It's helpful to remind myself that just because my brain thinks of it as unhealthy, doesn't mean it is" (r/EDAnonymous).

Diet-Subreddit Specific Themes

ON as Health Perfectionism.

Certain diet communities in diet-related subreddits were accused of encouraging exaggerated "healing claims" of specific dietary behaviors: "Like any other restrictive diet, zero-carb predisposes people to orthorexia. That, coupled with the amount of unreasonable healing claims on this subreddit, will make people use this diet to fix all their health issues" (r/zerocarb).

Concerns about healthy eating were thereby directed at expectations of perfect health in connection with a perfect diet, even if there was no indication of any health problems: "I worry about orthorexia being prevalent in the Wheat-Free-Plant-Based community since there is such a focus on eating absolutely as healthy as possible, even for those with little known heart risk, good blood work, healthy weight, etc." (r/PlantBasedDiet). Health perfectionism was thereby more than just avoiding ill health, it was seen as a goal in itself. Due to a lack of balance and moderation, these attitudes were considered just as problematic as other disordered eating behaviors by few commenters:

> "It's ultimately just comes down to preserving diversity […]. People who believe a healthy diet means you only ever eat whole foods and never have anything processed have just as unhealthy an attitude about food as people with recognized eating disorders" (r/vegan).

Other comments, however, saw perfectionism and discipline as a way to stand out, with society being perceived as impeding personal choices, holding back individuals from outstanding achievements:

> "People who succeed are the most dedicated in all aspects of training, for whatever it is they enjoy doing. Orthorexia might just stem from not being socially accepted for being driven. People shouldn't eat what they don't want to eat" (r/PlantBasedDiet).

ON's Underlying Mental Health Concerns

Despite ON being identified as a mental health concern by some commenters in diet-related subreddits, many questioned the focus on healthy eating in its definition:

> "[…] It appears like the term orthorexia is just something that people with unhealthy behaviors use to justify their poor eating habits rather than address the actual problem (i.e., anxiety). In other words: it's not an eating disorder because it's not the eating that's the problem, it's the anxiety […]" (r/PlantBasedDiet).

The reference to "healthy eating" was confusing to many commenters who saw obsessiveness and irrational fears as the central problem:

> "Orthorexia is more of an OCD-like manifestation focused on eating than anything else. Like many are terrified of normal things like gluten and MSG, which aren't inherently unhealthy. They are just immensely and unreasonably selective about their foods, obsessed with clean eating etc." (r/vegan).

Commenters, therefore, stressed the irrationality and harmfulness of behaviors and thoughts underlying ON, rather than associating it with healthy eating: "Both healthy and unhealthy eaters can develop orthorexia. But there's a difference between being informed/concerned about what you eat and being obsessed to the point that you can't focus on any aspect of your life other than food" (r/PlantBasedDiet).

ON Pathology as a Result of Problematic Norms

In contrast to ED subreddits, commenters within the diet-related subreddits saw a problem in the way society normalized "unhealthy" eating. Therefore, including a focus on a healthy diet in the definition of a disorder was seen as wrongfully pathologizing a non-compliance with detrimental norms: "In a society where the majority of people engage in bad eating habits, orthorexia as a pathology might wrongfully classify those who attempt to eat healthfully as disordered since psychological classification systems reinforce societal standards" (r/PlantBasedDiet).

Especially, the "standard" US American diet was criticized for being too unhealthy, sparking discussions on how health concerns can seem too extreme if they differ from what is assumed to be the norm:

> "One of the proposed criteria is an abnormal concern about one's own health. What does that mean? Do you have a mental illness if you choose to eat less fast food? That could be seen as an abnormal level of concern in a standard American diet" (r/PlantBasedDiet).

The lack of education on what a healthy diet looks like and a lack of opportunities to eat healthy foods were seen as reasons for why some people engage in extreme health behaviors: "Orthorexia wouldn't be an issue if society promoted healthy eating more and if there wasn't so much false information regarding nutrition in circulation" (r/PlantBasedDiet).

Furthermore, multiple commenters highlighted that not healthy eating, but obesity and related health conditions, were reasons for concern:

> "Too frequently, those who are seeking to have healthy lifestyles are accused of orthorexia. Although I'm sure there are those that go overboard, they are really uncommon. In the meantime, last time I checked the obesity rate in the USA was increasing. [...] Society was constructed around unhealthy lifestyles. If someone decides to reject this lifestyle, it somehow makes this person the unhealthy one. Perhaps society requires better restaurants and improved regulations on food" (r/PlantBasedDiet).

> "Associating healthy eating with negative outcomes could have wide-ranging detrimental consequences and lead to a significant rise in mortality from heart disease, diabetes and other illnesses which could be caused or worsened by unhealthy eating" (r/PlantBasedDiet).

As seen in this comment, dietary behaviors were perceived as directly related to certain health problems. At the same time, pathologizing "healthy" eating was considered to be detrimental for recognizing "unhealthy" eating behaviors:

> "In the United States, what we consume is a common cause for mortality, which claims many more lives annually than cigarettes. Additionally, it is the cause of disability. But if you're upset that your children are having sweets for breakfast, you could be suffering from a mental disorder" (r/PlantBasedDiet).

Commenters compared "unhealthy" eating to other health risk behaviors (such as smoking, not using a seat belt in a car or drug abuse) to illustrate how dangerous "unhealthy" behaviors can be. Often, these arguments were used to defend why commenters were trying to educate others about "healthier" diets and lifestyles. Social isolation and interpersonal conflicts were directly associated with not being able to access or share healthy food options. Healthy eating was often conceptualized as an "individual choice", which offended others if it meant that they did not participate in social events that involved sharing food:

> "[...] Even though I couldn't eat the food, I used to go out to restaurants with other people. I would eat my food in advance and then just hang out and chat with people. However, when people want to be nice, they frequently give you food, and they feel rejected if the food is declined. Sharing food has just so much emotional power for individuals" (r/PlantBasedDiet).

The argument that ON might be causing interpersonal conflicts was dismissed by many commenters who felt their rejection of "unhealthy" foods was justified. Usually, the problem was seen in other people not accepting these choices, which was called "narcissistic projection" by one commenter (r/PlantBasedDiet). Conflict was seen as necessary when individual choices differed from each other, and definitions of ON were seen as targeting specific diets (such as veganism and whole food plant-based) as well as people adhering to these "healthy" restrictions:

> "Not wanting to upset others or not doing what they do does not mean that one should give in to social pressures so that one feels better. [...] Foods are not substitutes for or embodiments of an

actual human relationship and people who get upset when other people are not eating with them are fetishizing food" (r/PlantBasedDiet).

Discussion

The present qualitative analysis explored the different ways in which the term "orthorexia" is currently being described on one of the largest online discussion forums worldwide. Social media platforms, such as Reddit, allow users to not only be consumers *and* producers of information, but also to interact with each other during the process of production (Lievrouw, 2010). This interaction between different users created a rich data base for this study, which revealed not only differences between subreddit topic groups in conceptualizations of ON, but also potential barriers for the formulation of universal ON characteristics (e.g., a lack of (cultural) specificity when defining excessive health concerns). Previous research has shown that Reddit is an important medium for the distribution and evaluation of health-related information (Record et al., 2018) and controversial topics (those associated with mixed opinions) have been linked to the highest rates of online activity (Jasser et al., 2021).

With ON still being a controversial construct in clinical practice and research (Galfano et al., 2022), the present study helped to elucidate some of the social trends in how information regarding ON is being discussed within different Reddit communities. This included differences in how normative eating behaviours were defined within these subreddit communities (e.g., excessive health concerns as pathological versus healthy eating as irrefutably virtuous). It is not surprising that without a universally recognized definition of ON, conceptualizations and characteristics varied not only between the two subreddit communities, but also within these.

The wide scope of ON conceptualizations identified within the Reddit communities demonstrates that the term is associated with a variety of personal experiences, encompassing more than one distinct construct. Based on the current study, ON is clearly a term that is being widely used in a number of different ways in the general population. These findings illustrate the need to broaden perceptions of what is considered "disordered" and provide further evidence for people's growing anxieties around food, as well as their increasingly complicated relationship with health (Ross Arguedas, 2020). To the best of the authors' knowledge, the present study is the first study to compare online discussions from two distinct community contexts to highlight consistent as well as *conflicting* conceptualizations of ON.

In line with DeBois and Chatfield's (2021) findings, the current study revealed a perceived cross-over between ED behaviours and behaviours that were primarily associated with ON. Even though research has previously linked ON to an obsessive-compulsive symptomatology (Arusoğlu et al., 2008; Brytek-Matera, 2012), recent research has found ON symptoms (as assessed by current ON measurement scales) to be primarily associated with ED symptoms (Bartel et al., 2020; Strahler et al., 2018). One challenge of conceptualizing ON as an ED, however, is that the association between ON and body image concerns (i.e., a core symptom of some EDs) remains disputed (e.g., Barthels et al., 2015; Depa et al., 2019; Opitz et al., 2020; Yakın et al., 2021). In the present study, characteristics and causes of ON were often discussed by individuals who reported an ED history. In this context, ON was frequently associated with intended weight loss, calorie restrictions and body image concerns, as has equally been shown by previous qualitative research (DeBois & Chatfield, 2021; Cheshire et al., 2020; White et al., 2021).

Other commenters, however, conceptualized ON in the context of their experiences with health anxieties or obesity fears and did not mention (or specifically denied) any body image concerns. Even though the distinction between different motivations for weight control (e.g., to avoid "unhealthy" weight gain or to address body dissatisfaction) are at times difficult to establish, disparities in perceived causes and characteristics of ON highlight how public conceptualizations are context-dependent and highly influenced by what ON means to each person individually, with no official criteria providing guidance. This variation in the use and understanding of the term "orthorexia" in the general population may go some way to explaining the seemingly contradictory findings from research about whether ON is typically associated with body image concerns (McComb & Mills, 2019) and underlines the need for good quality assessment of ON in future research. As illustrated in this study, there is an overlap in people's understandings of weight and perceived healthiness, especially for those with an ED history, which will need to be addressed in future conceptualizations.

Furthermore, the present study highlighted that some people experience a cyclical pattern of AN and ON. This cyclical pattern could be explained through ambivalent attitudes toward ED recovery (e.g., not wanting to let go of rules and ideals; DeBois & Chatfield, 2021) and how ED recovery is defined by the individual (e.g., absence of

serious physical impairments; Fixsen et al., 2020). The relative benefits of conceptualizing ON as a distinct disorder versus a form/stage of AN in this context needs consideration, in order to allow for clear treatment recommendations to be formulated. When descriptions of ON considerably resemble descriptions of existing EDs this raises a question of why individuals prefer to identify with ON. One reason could be the higher social acceptability of ON (e.g., Greville-Harris et al., 2020), but other reasons are possible, such as ON providing a broader definition of EDs. Similar to other atypical ED presentations (e.g., Harrop et al., 2021), ON behaviours might simply reflect the diversity of ED expressions. Even though further research is needed to establish ON's conceptualization in rela tion to other EDs, the current findings highlight the need to improve education on what an ED can look like, both in health settings as well as within the general population.

Within ED-subreddits, most information that was shared about ON could be categorized as personal information (cf. Osatuyi, 2013; e.g., experiences of ON). However, the exchange of political information (e.g., the relevance of public health concerns) emphasized how conceptualizations of ON are socially constructed based on the perceptions of specific individuals within a specific public sphere. Interestingly, in diet-related subreddits, it was seen as counterproductive and confusing to label "healthy eating" as a disorder. High obesity rates (especially in the US) and a lack of food regulations were emphasized in this context, with ON being perceived as less problematic than "unhealthy" norms.

These views reflect the public narrative around the conceptualization of obesity as an "epidemic" (i.e., a spreading *disease*) that needs to be urgently addressed. The portrayal of a higher weight as a medical concern in and of itself demonstrates the pervasiveness of fatphobia, with a higher weight being perceived as unhealthy, immoral, and something to "fix" (Gailey, 2022). Some of the comments in diet-related subreddits further illustrate prevailing misconceptions around the relation between EDs and weight status, which neglect the increasing rates of "obesity" and comorbid ED behaviours (da Luz et al., 2017) as well as the existence of shared risk factors for both EDs and overweight status (e.g., Neumark-Sztainer et al., 2007). Even though previous studies have discussed the link between ON and fears of obesity (e.g., Håman et al., 2015), the present study findings highlight how the internalization of disjointed public health messages (e.g., obesity versus EDs) can interfere with the conceptualization of complex mental health experiences. Furthermore, these findings suggest that the recognition of ON will not be considered a priority as long as its unique contribution to pathology is still unclear (cf. Strahler & Stark, 2020).

In contrast to diet-related subreddits, commenters within ED subreddits commonly conceptualized ON in the context of a detrimental wellness and optimization culture (as presented on social media or prevalent in certain social circles). This finding supports previous hypotheses regarding the interconnectedness of ON and "healthism" (Hanganu-Bresch, 2020), a socio-political movement associated with a heightened health awareness, which conceptualizes health "holistically" (including body, mind, *and* spirit) and encourages self-responsibility in health-related matters (Crawford, 1980). The concept of healthism provides a coherent theoretical framework in which appearance ideals (the need to look "healthy", e.g., the avoidance of overweight) and health anxieties (the need to proactively stay physically healthy) could both be explained through the pursued avoidance of blame (from oneself as well as others) for not being able to achieve perfect health (cf. Hanganu-Bresch, 2020).

Overall, the present study shows that Reddit users who commented on ON in relevant subreddits associated health with specific values (e.g., morality, responsibility, self-respect) but also confusion and fear. For some commenters, these fears were seen as justifiable, requiring more proactivity in preventing negative health outcomes, while other commenters illustrated the risks for both mental and physical health if health behaviors were taken too far. Contrasting the perspectives of ED- and diet-related subreddits demonstrated that a coherent conceptualization of ON is presently complicated by a perceived interdependence of obesity as a public health issue, and healthism as a way to practice self-care and personal responsibility (cf. Cinquegrani & Brown, 2018). Future ON conceptualization approaches will therefore benefit from considering sociocultural factors (e.g., the perceived interconnectedness of health and weight, the effects of dietary fear mongering) in the definition of ON.

Study Limitations and Directions for Future Research

Several limitations must be considered for the present study. First, this study only focused on comments explicitly mentioning "orthorexia." This decision was made due to the high volume of available data. However, focusing only on the term itself led to the exclusion of comments that described ON without explicitly referring to the term. Even though this study was able to include a large amount of Reddit data, only comments made in response to original posts were publicly accessible on the Reddit data archive and available for analysis in this study. Due to practical

considerations and ethical concerns, the original posts were not retrospectively identified. However, including original posts in this analysis could have added depth and context to the themes that were generated from the present data set. Furthermore, the present study did not analyze any information related to comment authors, as the study focus was on cumulative information, rather than individual conceptualizations. In consideration of ethical guidelines, future research could gain further insights into ON conversations by analysing author interactions, posts, and thread-specific discussions within relevant subreddit communities to gain a better understanding of ON-related communication patterns.

Surprisingly, the subreddit r/Orthorexia did not contain any comments within the specified timeframe (not just a lack of comments specifically mentioning "orthorexia"). Even though the subreddit name explicitly refers to ON and the subreddit was founded in 2015, it has not been frequently used for discussions until recently, as a quick retrospective search on Reddit revealed. As Reddit is a dynamic space, some subreddits are used more frequently than others, with commenters potentially feeling uncomfortable to post questions or comments in a subreddit with few posts. Especially when people follow multiple subreddits, it is likely that they primarily engage in those subreddits that show the highest online activity. Established ED- and diet-related subreddits might have provided a sufficient and adequate space for ON discussions at that time.

As the present study demonstrated that ON is conceptualized differently within different virtual communities, future research could analyze how ON conceptualizations are related to a community-specific shared language, knowledge base, and identity (cf. Hine, 2000). To gain a more in-depth understanding of online narratives in the context of ON, future studies could further explore the community patterns, norms, and interactions of certain subreddit communities (cf. Høiland, 2019; McCaig et al., 2019).

In contrast to interviews or focus groups, this study's data were not elicited by the researcher conducting this project. Yet, conversations within the subreddit communities were highly influenced by the context they were posted in. For example, many comments within the subreddit r/PlantBasedDiet referred to a controversial video portraying ON as negligible. Even though valuable information was gained from these comments, specific responses might not have been posted without this stimulus. Considering these interactions and other time-specific factors (e.g., the publication of new health guidelines), future online research could explore the ways in which online discussions around ON are evolving within the context they are posted in.

Overall, longitudinal qualitative research is needed to investigate the development and maintenance of excessive health concerns in changing sociocultural environments. For example, the role of health anxieties in the development of ON is still unclear (see also Bartel et al., 2020; Tóth-Király et al., 2021). Many comments in the present study referred to a relationship between health conditions and dietary behaviors. Future research will have to determine to what extent ON involves both preventative behaviors as well as attempts to treat existing health conditions.

Conclusion

The analysis of two different categories of subreddits showed that online conceptualizations of ON are complex and context specific. The present study showed that many people identify with ON, even if it has not been recognized as a disorder by any official diagnostic classification system. Analysing online communities' discussions around ON provided unique insights into a variety of experiences associated with the onset and progression of maladaptive health concerns and highlighted potential barriers for a universal definition of ON. The wide-ranging conceptualizations of ON evidenced in online communities indicate a core challenge for research and clinical practice in this area as the term is being used as an umbrella concept which covers a range of distinct experiences and behaviors. Conceptual clarity is an important prerequisite for future developments in this field.

Conflict of Interest

The authors do not have any conflicts of interest to report.

Authors' Contributions

Marie-Christine Opitz: conceptualization, data curation, formal analysis, investigation, methodology, project administration, software, writing—original draft preparation. **Emily Newman:** conceptualization, methodology,

supervision, writing—review & editing. **Helen Sharpe:** conceptualization, methodology, supervision, writing—review & editing.

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