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The association between depression and eating styles in four European countries: The MooDFOOD prevention study

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ABSTRACT

Objective: Depression, one of the most prevalent and disabling disorders in Europe, is thought to be associated with unhealthy eating styles. As prevalence of depression and eating styles potentially differ across Europe, the current study aimed to investigate in a large, European sample, the associations of history of major depressive disorder and depression severity with unhealthy eating styles.

Methods: Baseline data of the MooDFOOD prevention study was used. The current analysis included 990 participants of four European countries (The Netherlands, United Kingdom, Germany, Spain). Analyses of Covariance and linear regression analyses were performed with depression history or depression severity as determinants, and emotional, uncontrolled, and cognitive restrained eating (Three Factor Eating Questionnaire Revised, 18 item) as outcomes.

Results: Depression history and severity were associated with more emotional and uncontrolled eating and with less cognitive restrained eating. Mood, somatic, and cognitive symptom clusters were also associated with more emotional and uncontrolled eating, and with less cognitive restrained eating. The somatic depressive symptoms "increased appetite" and "increased weight" were more strongly associated to unhealthy eating styles compared to other symptoms. No differences in associations between depression and unhealthy eating were found between European countries.

Conclusion: Our results suggest that depression is related to more unhealthy eating styles. Diminishing unhealthy eating styles in subthreshold depressed persons could potentially reduce adverse health consequences like weight gain, unhealthy dietary patterns and weight-related diseases. It is also possible that interventions that decrease depressive symptoms can lead to a decrease in unhealthy eating styles.

1. Introduction

Depression is one of the most prevalent and disabling disorders in Europe, with lifetime prevalence's between 9.9% and 21.0% [1]. The World Health Organization (WHO) global burden of disease study (2013) indicated that depressive disorders carry the heaviest burden of all mental disorders [2]. Obesity is another major global challenge, with over 50% of the European citizens is classified as being overweight, and over 15% as having obesity in 2014 [3]. These two challenges are not independent, depression and obesity have been consistently associated [4]. Extensive research suggest a bidirectional link between psychological health and a high body mass index, with depression associated with an 58% increased odds of being obese over ≥10 years [4]. The relationship between depression and unhealthy lifestyle factors contributing to obesity, such as poor diet, physical inactivity, smoking, and insufficient sleep, has received considerable attention [5,6]. Recent findings in mainly European samples indicate that depression might also be related to unhealthy eating styles as another unhealthy lifestyle factor [7–15].

Three major unhealthy eating styles (emotional eating, external/

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uncontrolled eating, and restrained eating), with three corresponding theories, have been proposed in the literature. Emotional eating is based on the psychosomatic theory, which assumes that some people are unable to distinguish hunger from other bodily arousal (e.g. emotions) [16]. External/uncontrolled eating is based on the externality theory, which suggests that exposure to attractive food and food-related external stimuli triggers uncontrolled or external eating [17]. Restrained eating is based on the restraint theory, which assumes some individuals to be chronic dieters, who constantly try to cognitively regulate their eating. However, at some point this control might break down due to "emotional turmoil", and they start to overeat again [18]. This process is called restrained eating.

Previous studies have shown associations between high depressive symptoms and more unhealthy eating styles [7–15]. The majority of previous studies have examined the association between depression and eating styles by assessing depressive symptomatology using self-report depression scales, although establishing major depressive disorder with formal psychiatric diagnostic criteria in a clinical interview is the "gold standard" [19,20]. Another important yet little studied aspect in this research area is the role of specific characteristics of depression, such as symptom clusters and profiles, in eating styles. Previous studies treated depression as a homogeneous entity, while depression is now known to be phenotypically and biologically heterogeneous [21–24]. Specifically, the symptom profile of depression with atypical, neuro-vegetative features is characterized by increased appetite [25,26], a heightened risk of obesity [23] and subsequent weight gain [27]. Hence, it could be expected that these specific somatic, neuro-vegetative symptoms of depression (e.g. increased appetite, weight gain, leaden paralysis) would have differential and stronger associations with unfavorable eating styles than other symptoms of depression. This has however so far not properly been investigated.

The existing body of research on associations between depressive symptoms and eating styles has focused on these relationships within single regions or nations, while culture is one of the main factors influencing food and meals [28–30]. While these studies indicate the depression - eating styles associations to be present in multiple countries, differences in inclusion criteria for participants, questionnaires used and covariates added make direct comparisons of these countries difficult. Only one study used two European countries to evaluate depression-eating styles associations [31], finding similar associations between higher depressive symptoms and more emotional eating in Danish and Spanish participants. However, participants in this study showed almost no depressive symptoms, and there were differences between the Danish and Spanish samples ("… evidence of fundamental differences in response tendencies…" p. 501), making comparisons difficult. No other studies investigated depression-eating styles association in multiple European countries simultaneously.

In a previous large scale study in Dutch patients with depressive disorder and healthy controls, we were the first to thoroughly examine associations between depression in its full clinical heterogeneity and unhealthy eating styles [32]. Associations were found between higher depression severity and higher levels of unhealthy eating styles. In addition, we found specific somatic depressive symptoms, associated with depression with atypical features, to be more strongly related to unhealthy eating styles as compared to mood symptoms associated with depression with melancholic features. Given potential differences in depression rates across Europe, for the current study our first research question was whether in a large four-country, European sample with subclinical depressive symptoms, history of major depressive disorder (MDD) and depression severity were associated with unhealthy eating styles. Our second research question was whether in four different European countries: The Netherlands, United Kingdom, Germany and Spain, associations between depression and eating styles were generalizable, or whether any cultural differences existed. Our third research question was whether specific symptom patterns associated to the different depressive subtypes were associated with unhealthy eating styles. For this, associations of depression symptom clusters and individual symptoms with eating styles were examined.

2. Method

2.1. Study sample

Baseline data of the MooDFOOD (Multi-country cOllaborative project on the role of Diet, Food-related behavior, and Obesity in the prevention of Depression) prevention study were used. The MooDFOOD prevention study is a randomized controlled trial (RCT), and its primary objective is to examine the feasibility and effectiveness of two different nutritional strategies to prevent a new episode of MDD in high-risk overweight persons with subsyndromal symptoms of depression. A detailed description of the MooDFOOD study design can be found elsewhere [33]. This prevention trial recruited a total of 1025 subjects in four different European countries (Germany, Spain, The Netherlands and United Kingdom). Participants were recruited via diverse strategies, including websites; local advertisements in social media and newspapers; mailings to registered subjects in the general practice setting or in other registers (e.g. city registers); and MooDFOOD brochures and posters in public areas. Participants were recruited in both urban and rural municipalities. Inclusion criteria were being aged 18 to 75 years old, being overweight or obese (body mass index (BMI) between 25 and 40 kg/m^2) and reporting subsyndromal symptoms of depression as operationalized by the Patient Health Questionnaire (PHQ-9) score of at least 5 [34]. Exclusion criteria were an episode of major depressive disorder in the past 6 months (according to psychiatric DSM-IV criteria), as determined in the structured MINI International Neuropsychiatric Interview 5.0 (MINI 5.0 [35]); use of antidepressant drugs or psychological interventions in the past 6 months; current eating disorder; history of psychosis, bipolar disorder, substance dependence or other severe, psychiatric disorder that requires specialized clinical attention; history of or planned bariatric surgery; currently pregnant or breastfeeding; current severe, life-threatening physical disease; severe cognitive impairment sufficient to limit the conduct of the study as assessed through research staff evaluation of participant's ability to complete the screening instruments in an adequate manner; current adherence to supervised behavioral interventions or using specific dietary supplements that are competing with the MooDFOOD prevention trial multi-nutrient intervention. The research protocol was approved by the Ethical Committees of the contributing countries and all participants provided written informed consent. Between September 2015 and October 2016, all participants underwent a baseline assessment containing an extended face-to-face interview conducted by a trained research assistant, which included a standardized diagnostic psychiatric interview (MINI 5.0 [35]), blood sampling and self-report questionnaires. After excluding those with missing data on the eating styles questionnaire (n = 35) the final sample consisted of 990 subjects.

2.2. Depression measurements

At baseline, presence of a lifetime history of major depressive disorder was established using the MINI 5.0 [35]. All participants were classified as either not having or having a lifetime diagnosis of major depressive disorder, thereby composing the variable "depression history yes/no".

Severity of depressive symptoms in the past week was assessed with the 30-item Inventory of Depressive Symptomatology - Self Report (IDS-SR, range 0–84; [36]). Items were scored from 0 ("no problems") to 3 ("severe problems"), and a sum score was computed. In order to further improve clinical interpretability, individual symptoms were categorized into symptom clusters, as done in earlier studies [37–39]. Three symptom clusters were made: mood symptoms (10 items, range 0–30), somatic symptoms (16 items, range 0–48) and cognitive symptoms (4 items, range 0–12; see Supplementary Table 1 for an overview). For