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No evidence of seasonal variation in mild forms of depression

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ABSTRACT

Background and objectives: Seasonal Affective Disorder (SAD) is ubiquitous in popular culture and has influenced psychiatric diagnosis with the inclusion of the seasonal pattern modifier for the Major Depressive Episode in DSM. However, recent research has not supported the association of Major Depressive Episode with seasonal changes. The present study was conducted to determine if a seasonally-related pattern of occurrence of mild variants of depression could be demonstrated in a population-based study.

Methods: This is a cross-sectional U.S. survey of adults who completed the PHQ-8 Depression Scale with mild depression defined using a PHQ-8 cut score and a second model based on the DSM-5 diagnosis, Depression with insufficient symptoms. Regression models were used to determine if either variant of mild depression was related to season, latitude, or measures of daylight hours.

Results: Neither measure of mild depression was related to daylight hours or its proxy measures.

Limitations: Screening instruments for depression, even if consistent with DSM-5 diagnostic criteria, do not allow a formal diagnosis of depression or the exclusion of similar-appearing disorders. Current depression symptoms but not duration of depressive episode is measured.

Conclusions: Mild depression is not related to seasonal changes or proxy measures of light exposure. The findings cast doubt on light deficiency as a causal factor of depressive disorders, which underpins the inclusion of the seasonal pattern modifier in DSM-5 and light supplementation as a treatment modality.

1. Introduction

In 1984, the construct of Seasonal Affective Disorder (SAD) was introduced as a type of depression that regularly occurs in the fall and winter seasons among some individuals with relapsing forms of the disorder (Rosenthal et al., 1984). It is hypothesized that among people with SAD, regular and complete remission of symptoms typically follows in spring and summer months. A standalone diagnosis of SAD has never been formally introduced into any version of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1987, 2000, 2013). Rather, DSM-III-R (American Psychiatric Association, 1987) introduced a seasonal pattern modifier that could be added to some affective disorder diagnoses. The decision to include this seasonal pattern modifier was based on the limited number of SAD studies available at the time. The seasonal pattern modifier has been continued in subsequent versions of the DSM with some diagnostic criteria changes (Bauer & Dunner, 1993; Spitzer & Williams, 1989). However, the SAD construct, particularly as measured by the Seasonal Pattern Assessment Questionnaire (SPAQ, Rosenthal, Bradt, & Wehr, 1987), doesn't correspond to the DSM diagnostic criteria for depression. For example, the SPAQ asks respondents to recall if mood or appetite "change with the seasons," whereas the DSM-5 criteria require symptoms such as depressed mood or difficulty with thinking/concentration (American Psychiatric Association, 2013). The SAD construct has also been more commonly characterized by atypical depression symptoms such as carbohydrate craving and hypersomnia, rather than appetite loss and insomnia (Rosenthal, Genhart, Jacobsen, Skwerer, and Wehr, 1987).

A worldwide research literature on SAD has developed over the past three decades on epidemiology (Blazer, Kessler, & Swartz, 1998; Booker & Hellekson, 1992; Kasper, Wehr, Bartko, Gaist, & Rosenthal, 1989; Levitt, Boyle, Joffe, & Baumal, 2000; Rosen et al., 1990), etiology (Lewy & Sack, 1988; Rosenthal et al., 1988); diagnosis (Eagles, 2004; Reeves, Rohan, Langenberg, Snitker, & Postolache, 2012), and treatment (Mårtensson, Pettersson, Berglund, & Ekselius, 2015; Rohan et al., 2015; Terman et al., 1989). SAD is reported to develop in vulnerable individuals when availability of and exposure to natural sunlight during winter months is diminished (Magnusson & Boivin, 2003; Partonen & Lönnqvist, 1998).

Because of the differences between SAD and DSM depression with seasonal pattern, some studies, particularly those using instruments based on the symptoms of depression, have produced unexpected

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results. Studies using DSM symptoms of depression usually produce lower prevalence estimates of seasonal depression than studies that use the SPAQ (Blazer et al., 1998; Levitt & Boyle, 2000; Murray, 2004; Steinhausen, Gundelfinger, & Winkler-Metzke, 2009) or fail to find any seasonal variation at all (Levitt et al., 2000; Magnusson, Axelsson, Karlsson, & Oskarsson, 2000; Mersch, Middendorp, Bouhuys, Beersma, & van den Hoofdakker, 1999a; Nillni, Rohan, Rettew, & Achenbach, 2009; Traffanstedt, Mehta, & LoBello, 2016). Looking generally at these studies, it is reasonable to suppose that the seasonal relationship to depression weakens or disappears when investigated with instruments other than the SPAQ and when expectations about seasonal depression are not communicated to respondents. These findings raise questions about the original decision to create a seasonally recurrent form of depression in DSM based on research of the SAD construct.

There have been efforts to develop instruments for measuring seasonally recurrent depression that improve upon the SPAQ by asking respondents to report on actual symptoms of depression, rather than simply asserting that mood changes with seasons. However, instruments such as the Seasonal Assessment Form (SAF, Young, Hutman, Enggasser, & Meesters, 2015) ask about depression symptoms experienced specifically in winter. The Seasonal Health Question (SHQ, Thompson & Cowan, 2001) asks respondents to report the season during which episodes of depression were most common. Such instruments rely on recall of past seasonal occurrences of depression to establish a diagnosis. This practice is sensible and realistic in a clinical setting, but it is less than sound in attempting to establish the existence of a seasonally recurrent subtype of depression.

There has been substantial research effort to determine if recurrent forms of depression less severe than major depression may also show patterns of seasonal variation. The DSM-5 restricts use of the seasonal pattern modifier to the diagnoses of major depression and bipolar disorder (American Psychiatric Association, 2013). DSM-IV-TR included a proposed diagnostic category of minor depression (American Psychiatric Association, 2000) and, with some modification, minor depression is included in DSM-5 as Depression with insufficient symptoms (American Psychiatric Association, 2013, pp. 183–184). The 10th revision of the International Classification of Diseases does permit diagnosis of a mild form of depression (2 or 3 depression symptoms) using the Recurrent depressive disorder, current episode mild category (F-33, ICD-10; World Health Organization, 1992). Recurrent depressive disorders of any level of severity may be seasonal depressive disorders.

It has been reported that 14% of the U.S. adult population experiences a milder SAD variant called “winter blues” (Rosenthal, 2006; Targum & Rosenthal, 2008).When tied specifically to the SPAQ, this SAD variant is often referred to as subsyndromal SAD (S-SAD; Kasper, Rogers, et al., 1989; Magnusson, 1996; Steinhausen et al., 2009). There is considerable research interest in mild or subsyndromal depression (Pietrzak et al., 2013) as well as interest in determining if mild depression recurs seasonally (Levitt, Lam, & Levitan, 2002).

The purpose of this study was to investigate the possibility of a seasonal pattern in mild variants of depression. There is an endemic level of depressive symptomatology in the population owing to a variety of clinical entities (e.g., Major Depression, Dysthymia). Entering the fall and winter months, the population level of depressive symptomatology should increase above this endemic level as symptoms emerge from the seasonally related cases of depression. As in Traffanstedt et al. (2016), we analyzed Behavioral Risk Factor Surveillance System data, which provided a measure of depression that is consistent with DSM-5 criteria and is administered in a double-blind manner to a large, population representative sample. We considered two definitions of mild depression in our analyses: one based on a Patient Health Questionnaire-8 (PHQ-8, Kroenke & Spitzer, 2002) cut-score and another based on the DSM-5 diagnostic criteria for Depression with insufficient symptoms.

2. Method

2.1. Materials and procedure

The current study was exempt from review by the Institutional Review Board at Auburn University at Montgomery.

The BRFSS is an annual health survey that collects information regarding health risk behaviors, healthcare access, and disease prevention measures (Centers for Disease Control and Prevention, 2013). The BRFSS uses random-digit dialing telephone survey in the United States at the state level (including territories) to gather data about current risk behaviors and health practices (CDC, 2013). We used the 2006 BRFSS data set for this study because a large number of states (i.e., 36) administered the Anxiety and Depression Module as part of the standard survey (Centers for Disease Control and Prevention, 2007). This module includes the Patient Health Questionnaire-8 (PHQ-8) depression scale (Kroenke et al., 2009; Kroenke & Spitzer, 2002).

The Selected Metropolitan/Micropolitan Area Risk Trends (SMART), a subset of the 2006 BRFSS data set, was created to provide county-level estimates of health behaviors and risks within metropolitan (50,000 + population) or micropolitan (at least 10,000 but less than 50,000 population) statistical areas (Centers for Disease Control and Prevention, 2011). The SMART data set utilized in this study included data from 21 states (63 counties) that had administered the PHQ-8. The analyses were conducted using two different definitions of mild depression as described below.

2.2. Participants: PHQ-8 minor depression cut-score model

To identify cases of minor depression based on PHQ-8 scores, we followed the scoring algorithm presented in Fan et al. (2009). Responses to PHQ-8 items are given as number of days during the past two weeks that a symptom of depression was experienced. The scoring model classifies responses as follows: 0–1 day = “not at all”; 2–6 days = “some days”; 7–11 days = “more than half of the days”; and 12–14 days = “nearly every day.” The “not at all” response category was assigned 0 points, with 1, 2, and 3 points assigned to responses moving up the severity dimension. These scores are then summed to provide a PHQ-8 total score that ranges from 0 to 24. The authors of this algorithm specify that individuals scoring between 5 and 9 (inclusive) on this scale are classified as experiencing mild depression (Fan et al., 2009).

Of the 34,876 survey respondents, 34,294 had complete data (Traffanstedt et al., 2016). A subsample of 5488 met the PHQ-8 cut-score criterion for minor depression. Table 1 summarizes demographic information about the subsample of respondents whose PHQ-8 scores were within the minor depression range based on the cut-score model.

2.3. Participants: DSM-5 depressive episode with insufficient symptoms model

The DSM-5 indicates that Depressive episode with insufficient symptoms may be diagnosed in individuals who present with depressed mood and at least one of the other symptoms for depression, accompanied by subjective distress or functional impairment and lasting at least two weeks (American Psychiatric Association, 2013). Individuals who met the criteria under the cut-score model were screened to determine if they endorsed the depressed mood item at least two days out of the previous 14. Table 1 presents sample characteristics for the respondents whose data were used in this analysis.

2.4. PHQ-8 depression scale

The PHQ-8 is an instrument that assesses Major Depressive Episode in accordance with DSM-5 diagnostic criteria except that it does not include an item about suicidal ideation (Kroenke & Spitzer, 2002). The