Journal of Affective Disorders 207 (2017) 38–46

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Reconsidering the definition of Major Depression based on Collaborative Psychiatric Epidemiology Surveys

Tom Rosenström *, Markus Jokela

Institute of Behavioural Sciences, University of Helsinki, Finland

ARTICLE INFO

Article history:
Received 27 May 2016
Received in revised form
12 September 2016
Accepted 18 September 2016
Available online 20 September 2016

Keywords:
Diagnostic definitions
Data mining
Disability
Nosology
Validity
Clinical relevance

ABSTRACT

Background: Diagnostic definitions for depressive disorders remain a debated topic, despite their central role in clinical practice and research. We use both recent evidence and nationally representative data to derive an empirically-based modification of DSM-IV/-5 Major Depressive Disorder (MDD).
Method: A modified MDD diagnosis was derived by analyzing data from Collaborative Psychiatric Epidemiology Surveys, a multistage probability sample of adults ($n=20\,013$; age $\geq$ 18 years) in coterminous USA, Alaska and Hawaii. The old and the newly suggested MDD definitions were compared for their associated disability (WHO Disability Assessment Schedule and number of disability days in past month), suicide attempt, and other covariates.
Results: Our data-driven definition for major depression was "lack of interest to all or most things" plus four other symptoms from the set {weight gain, weight loss, insomnia, psychomotor retardation, fatigue, feelings of worthlessness, diminished ability to think/concentrate, suicidal ideation/attempt}. The new definition captured all the disability implied by MDD and excluded cases that showed no greater disability than the general population nor increased risk of suicide attempts. The lifetime prevalence of the new diagnosis was 14.7% (95% CI = 14–15.4%) of the population, slightly less than for the old definition (16.4%; CI = 15.4–17.3%).
Limitations: Only conservative modifications of MDD could be studied, because of restrictions in the symptom data.
Conclusions: With only small adjusting, the new definition for major depression may be more clinically relevant than the old one, and could serve as a conservative replacement for the old definition.

1. Introduction

Clinical definitions for depressive disorders remain a debated topic, despite the high prevalence and burden of disability of these disorders. Recent studies have investigated the depressive disorders at the level of individual symptoms instead of composite clinical definition of Major Depressive Disorder (MDD) (Bringmann et al., 2015; Cramer et al., 2012; Fried and Nesse, 2015; Keller et al., 2007; Keller and Nesse, 2005; Lux and Kendler, 2010; Oquendo et al., 2004). The symptom-level analysis is attractive for basic research because the definition of the MDD "syndrome" is not well established empirically (Haslam et al., 2012; Keller et al., 2007; van Loo et al., 2012; Lux and Kendler, 2010; Solomon et al., 2001). At the same time, clinical practice requires criteria by which to assign individuals to treatment groups, and there is some evidence to support a temporal clustering of symptoms which is consistent with sudden phase transitions characteristic to syndromatic states (Hosenfeld et al., 2015; van de Leemput et al., 2014). Accordingly, there is a challenge to provide empirically based answers to the question "when does depression become a mental disorder" (Maj, 2011a, 2011b). Treatment assignment based on single symptoms may be infeasible and reliable biomarkers identifying depression are lacking, implying that symptom combinations need to be considered in both research and treatment. This paper draws from the new symptom-level findings and uses United States national-level estimates to derive an empirically-based recommendation for a more clinically salient definition for the Major Depression (MD; we drop the "Disorder" to distinguish between the suggested new ideas and the old definition, and to encompass both episodes and disorder).

Abbreviations: MDD, DSM-IV Major Depressive Disorder; MD, an alternative definition for Major Depression to be derived; CPES, Collaborative Psychiatric Epidemiology Surveys; WHODAS, World Health Organization's Disability Assessment Schedule; WMH-CIDI, World Mental Health Survey Initiative's version of the Composite International Diagnostic Interview

* Correspondence to: Institute of Behavioural Sciences, University of Helsinki, Siltavuorenpenger 1 A (PO Box 9), 00014 Helsinki, Finland.
E-mail address: tom.rosenstrom@helsinki.fi (T. Rosenström).

http://dx.doi.org/10.1016/j.jad.2016.09.014
0165-0327/

The current Major Depressive Disorder (MDD) diagnosis requires the presence of at least one of the two core symptoms: (1) depressed mood and/or (2) markedly diminished interest or pleasure in all, or almost all, activities (American Psychiatric Association, 2013). However, it can be difficult to define depressed mood or sadness without referring to some other symptoms. For example, according to DSM-5 depressed mood is indicated "by either subjective report (e.g., feels sad, empty, hopeless) or observation made by others (e.g., appears tearful)" (American Psychiatric Association, 2013). But, how does one know when one is feeling sad? In April 18th, 2016, Wikipedia defined sadness as "emotional pain associated with, or characterized by feelings of disadvantage, loss, despair, helplessness, disappointment and sorrow", which seems many things rather than one. In more quantitative terms, we have previously found that, after taking a sadness item into account, other self-report items provided little predictive value for the WHO-CIDI diagnosis of MDD (Rosenström et al., 2015); this is an expected finding when the "sadness" item implicitly implies multiple other symptoms. In a prospective network analysis of depressive symptoms, Bringmann et al. (2015) showed that sadness has a high "indegree" but a low "outdegree" and "betweenness" in relation to other symptoms, suggesting that (statistically) it mostly summarizes other prevailing symptoms instead of predicting them. Those with a lot of problems (symptoms) are likely to become sad (endorse the symptom in future), but the sad who currently lack the other problems are relatively unlikely to get lot of problems in the future.

Among the depressive symptoms, anhedonia (low positive affect) has been found to be relatively specific to depression e.g. when comparing depression, anxiety, and schizophrenia, whereas "depressed mood" represents "a mixture of relatively high NA [negative affect] and moderately low PA [positive affect]", therefore being less specific to depression and more related to general distress (Clark and Watson, 1991; Joiner et al., 2003). Ideally, constructing a data-driven definition should start from the most elementary (specific) components available rather than use variables that already are *a priori* given compositions of many elements. Furthermore, sadness is frequently seen as a normal, adaptive response to loss (Kleinman, 2012; Wakefield and First, 2012; Wakefield and Schmitz, 2013). In contrast, lack of interest in "all, or almost all, activities" should reliably intervene with goal-directed behaviors. Therefore, anhedonia may also be intrinsically more disabling than sadness.

Based on the findings cited above, we take only "diminished interest in all, or almost all, activities" as the core feature of depression in our analysis, as learning models of depression have done (Griffiths et al., 2014; Trimmer et al., 2015). For ease of reference, we call this "lack of interest" also as "anhedonia", although strictly speaking, it refers to lack of pleasure. We then study the following empirical questions: How do the other depressive symptoms distribute in the anhedonic population and what would be a sensible definition of depressive disorder based on that distribution? How much this new definition of depression overlaps with the old one? Which one of the definitions, the old or the new, is more clinically relevant? A diagnostic definition that implies higher level of disability, longer episodes, and greater probability of suicide attempts than an alternative definition is an example of comparatively "clinically relevant" diagnosis. These questions are analyzed here using a representative population sample of psychiatric symptoms in the United States, the World Health Organization's (WHO's) Collaborative Psychiatric Epidemiology Surveys (CPES) (Alegria et al., 2015).

2. Methods

2.1. Sample and procedures

CPES data joins together three multi-stage area probability samples, the National Comorbidity Survey Replication (NCS-R), the National Study of American Life (NSAL), and the National Latino and Asian American Study of Mental Health (NLAAS). Collection of the samples were funded by the National Institute of Mental Health and they were selected using the sampling frames and sample selection procedures that are common to the University of Michigan Survey Research Center's National Sample design, and they shared essential scientific objectives and survey instrumentation for mental health diagnostics. The joint sample design and sampling methods for the CPES data have been previously described (Heeringa et al., 2004) and the data was available to us via the Inter-university Consortium for Political and Social Research (ICPSR) service (Alegria et al., 2015). The joint sample represents all adults (i.e., age 18 years or more) residing in households in coterminous United States, Alaska and Hawaii, excluding institutionalized persons and those living on military bases (NCS-R and NSAL also excluded non-English speakers).

CPES is a "complex sample design" that allows for unbiased estimation of population statistics for the United States of America, but this requires survey-weighted estimation (Heeringa et al., 2004; Lumley, 2010). The CPES weights are products of a weight for unequal probability of selection, a weight for nonresponse, and a weight for post-stratification. The unequal probability of selection per selected individual results from a four-stage sampling process: a primary stage sampling of U.S. Metropolitan Statistical Areas and counties, followed by second-stage sampling of area segments, a third-stage sampling of housing units, and a fourth-stage of random selection of eligible respondents from the housing units. The sample is post-stratified to a 11 × 12 grid of population totals for geographic domain by race/ancestry (Vietnamese, Filipino, Chinese, All other Asian, Cuban, Puerto Rican, Mexican, All other Hispanic, Afro-Caribbean, African-American, White, All Other). The final CPES sample includes 20 013 individuals (8550 men and 11 463 women).

2.2. Assessment instruments

The selected respondents were interviewed according to the World Mental Health Survey Initiative's version of the Composite International Diagnostic Interview (WMH-CIDI), which is a modified version of the original WHO-CIDI (Kessler and Üstün, 2004). Both WMH-CIDI and the other CPES questions were administered using a computer-assisted interview (Alegria et al., 2015). Although the WMH-CIDI allows for both 12-month and lifetime diagnoses, for simplicity, we concentrate on the data on lifetime diagnoses and on the presence versus absence of the depressive symptoms. A sensitivity analysis is conducted for a central disability outcome using 12-month diagnoses obtained by additionally requiring positive endorsement on the CPES variable "V00928" (an episode of being sad/or/discouraged/or/uninterested and having other problems during the past 12 months).

The presence of a symptom was determined exactly as in the "DSM-IV Major Depressive Episode" part of the ICPSR documentation for diagnostic algorithms (Alegria et al., 2015). For example, presence of anhedonia was inferred when the participant had answered positively to either one of the two diagnostic questions. The first question was "Think about the period of [(several days/two weeks)] or longer during that episode when your [(sadness/or/discouragement/or/lack of interest)] and other problems were most severe and frequent. During that period of [(several days/two weeks)], did you lose interest in almost all