



Prevalence of mental disorders and related functioning and treatment engagement among people with diabetes

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ABSTRACT

Aims: To examine prevalence, functioning and treatment associated with all DSM-5 12-month mood, anxiety, eating and substance use disorders among people with diabetes in data obtained from the National Epidemiologic Survey on Alcohol and Related Conditions-III.

Methods: Through multistage stratified randomized sampling a sample representative of the United States civilian population was obtained. Prevalence of diabetes (Type 1 and 2), DSM-5 disorders, physical and mental functioning, and treatment utilization were assessed via telephone interview. Analyses of weighted data (N = 36,138) included calculation of descriptive statistics, and chi-square, logistic and linear regression analyses.

Results: Participants with (vs. without) diabetes (9.3% of weighted sample) had a significantly: (a) higher prevalence of any anxiety disorder and posttraumatic stress disorder (with and without adjustment for socio-demographic characteristics), and any mood disorder, major depressive disorder and specific phobia (with adjustment), (b) lower prevalence of any substance use disorder and alcohol and tobacco use disorders (with and without adjustment), and cannabis use disorder (without adjustment). Among participants with diabetes, mental disorder prevalence was consistently associated with sex and age, and to a lesser frequency, race/ethnicity. Lower levels of physical and mental functioning were found among participants with diabetes and a comorbid mental disorder. A minority of participants with diabetes and a comorbid mental disorder received treatment for mood and anxiety disorders, and few received treatment for eating and substance use disorders.

Conclusions: Multiple types of mood, anxiety, eating and substance use disorders are prevalent, problematic, and often untreated among people with diabetes.

1. Introduction

Type 1 and Type 2 diabetes mellitus are associated with substantial disease burden [1]. Mental disorders, such as mood (e.g., major depressive disorder), anxiety (e.g., generalized anxiety disorder), eating (e.g., anorexia nervosa), and substance use disorders (e.g., alcohol use disorder) are also associated with substantial personal costs [2]. It is thus clinically relevant that people with versus without diabetes have a higher risk of suffering from some mental disorders [3,4], and comorbid mental disorders are associated with increased physical and mental impairment among people with diabetes [5,6]. The current study attempted to replicate and extend research on the prevalence of numerous disorders within the broad categories of mood, anxiety, eating and substance use among people with diabetes. Additionally, we attempted to gain unique information on links between comorbid mental disorders among people with diabetes and physical and mental functioning and treatment utilization.

Lacking among research on the prevalence of mental disorders among people with diabetes are studies conducted with large, representative samples. Two studies have been conducted with global samples [3,4], and one reported prevalence estimates for participants in the United States [4]. In sex and age adjusted analyses, Lin and colleagues [4] found an increased prevalence of multiple 12-month mood, anxiety and alcohol use disorders for participants with diabetes in multiple countries and when pooled across countries (e.g., major depressive disorder, generalized anxiety disorder). Only the prevalence of agoraphobia/panic disorder was increased in the United States sample [4]. de Jonge et al. [3] found an increased prevalence of numerous lifetime mood, anxiety, eating, and substance use disorders (and intermittent explosive disorder) among people who were diagnosed with diabetes after onset of the mental disorder. Only major depressive episode/dysthymia, intermittent explosive disorder, binge eating and bulimia nervosa were significantly elevated after adjusting for all disorders analyzed. Utilizing a smaller, though, representative sample

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from the United Kingdom, Das Munchi et al. [5] found an increased prevalence of any anxiety (obsessive-compulsive disorder, generalized anxiety disorder, specific phobia, panic disorder) or depressive (major depressive episode) disorder, and mixed anxiety and depressive disorder.

Though increased prevalence of mood, anxiety and eating disorders among people with diabetes has been demonstrated in additional research [7–11], such research is often limited by small and/or potentially non-representative samples (e.g., adolescent females, low income patients) or other factors. For example, the majority if not all studies providing information on bipolar disorder/diabetes comorbidity, have done so indirectly by investigating the potential for bipolar medications to increase risk of metabolic syndrome, and thus Type 2 diabetes ([12]; cf. [13]). Meta analyses and systematic reviews finding increased prevalence of depression and anxiety among people with diabetes [7,8,11] are limited by the quality of these individual studies analyzed and reviewed.

It is surprising that diabetes and substance use disorders have received so little attention given (a) the growing literature that suggests that moderate alcohol consumption may protect against the development of Type 2 diabetes [14], and (b) people with diabetes may be prescribed medications with a high potential for abuse to treat complications and consequences of their disease (e.g., opiate medications for painful diabetic neuropathy). Many specific substance use disorders have not been investigated in relation to diabetes. For those that have, the existing research is mixed with studies finding that people with diabetes have a similar [4,15], or increased [16] prevalence of drug (broadly), tobacco and alcohol use disorders.¹

Few studies have examined associations between mental disorder comorbidity and functioning among people with diabetes, even though both diabetes and mental disorders are independently associated with reduced functioning and increased disability [20–23]. Thus, there is reason to believe that the combination of diabetes and a comorbid mental disorder would be associated with greater physical and mental disability than either diabetes or mental disorders would alone. Indeed, studies that have focused on depressive and, to a lesser extent, anxiety disorders, have found that the combination of diabetes and a comorbid mental disorder and/or symptoms thereof is associated with reduced functioning [5,6]. Additionally, among people with diabetes, mental disorders are associated with poor diabetes treatment adherence [24], poor glycemic control [25], and increased complications [26], all of which may negatively impact functioning.

Even fewer studies have examined the utilization of treatment for mental disorders among people with diabetes. Utilization of mental disorder treatment may represent a clear and attainable target for improving both physical and mental functioning among people with diabetes. Indeed, studies have demonstrated that medication or psychotherapy can reduce depression among people with diabetes, in addition to improving diabetes-related health (e.g., HBA1C) and diabetes treatment adherence [27–29]. What is not known is the overall rates of utilization of treatment for any class of mental disorder (e.g., mood disorders). Such information could potentially identify important gaps in diabetes care.

Prevalence, functioning, and treatment utilization are generally studied in isolation, and rarely among a sample representative of the general United States population. The current study examined diabetes and mental disorders among a large representative sample obtained from the third wave of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC-III) [30]. NESARC-III included an assessment of diabetes, thus allowing for an examination of prevalence, functioning and treatment associated with numerous DSM-5 [31] 12-month mood, anxiety, eating and substance use disorders. We sought to

investigate (a) whether diabetes was associated with increased prevalence of mental disorders, (b) whether diabetes and the presence of a mental disorders were associated with decreased physical and mental functioning, and (c) differences in rates of mental disorder treatment utilization among participants with and without diabetes and a mental disorder. We further examined associations between prevalence of DSM-5 disorders and sex, race/ethnicity and age among people with diabetes [6,8,9].

2. Methods

2.1. Participants

The United States civilian, noninstitutionalized adult population (over 18 years) was targeted for interviewing by NESARC-III from April 2012 through June 2013 [32]. Data was obtained from a total of 36,309 respondents via telephone interviews. 36,138 (99.5%) of respondents provided data regarding the presence of diabetes and were thus included in the present study. Sociodemographic characteristics separately for participants with and without diabetes are included in Table 1.

2.2. Procedure

Prior publications describe in detail the sampling procedures [30,32]. In summary, multistage stratified random sampling was established through probability sampling at primary, secondary and tertiary units: (1) individual counties or groups of contiguous counties, (2) groups of US Census-defined blocks, and (3) households within the secondary sampling units. Within the tertiary unit, eligible adults were randomly selected. Oversampling of Hispanic, black, and Asian respondents was achieved, in part by selecting two respondents in household with at least four eligible ethnic or racial minority individuals. The total NESARC-III response rate (60.1%) along with screener- (72.0%) and person-level response rates (84.0%) were comparable to recent surveys [32]. Data were adjusted (for nonresponse at the screener and person level and oversampling) and weighted (through post-stratification analysis) to represent the US civilian population [33]. Grant and colleagues [32] reported minimal differences in weighted distribution of participant characteristics between participants and the total eligible sample. Participant interviewers received multifaceted training and ongoing supervision. Oral consent was obtained from all participants. Participants completed structured interviews via telephone, and compensated with \$90.00. Data was verified through random callbacks. The institutional review boards of the National Institute of Health and contractor Westat approved all protocols. The sample was treated in compliance with all pertinent ethical standards.

2.3. Measures

2.3.1. Diabetes diagnosis

A single question was used to assess whether a person had a diagnosis of “diabetes or sugar diabetes in the last 12 months”, confirmed by a doctor or other health professional. This method has been validated across major epidemiological studies for estimating population prevalence of diabetes in the U.S [34,35].

2.3.2. DSM-5 diagnoses

DSM-5 mood, anxiety, eating and substance use disorders occurring in the prior 12-months were assessed by the Alcohol Use Disorder and Associated Disabilities Interview Schedule 5 (AUDADIS-5). The AUDADIS-5 is published by the National Institute on Alcohol Abuse and Alcoholism [36], and was designed to assess DSM-5 criteria for the mood, anxiety, eating and substance use disorders listed in Table 2. Diagnoses of mood, anxiety and eating disorders excluded substance

¹ Numerous studies have examined a related topic, the prevalence of diabetes among people diagnosed with mental disorders [17–19].

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