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Latent subtypes of depression in a community sample of older adults: Can depression clusters predict future depression trajectories?

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ABSTRACT

Identifying sources of heterogeneity in late life depression remains an important focus of psychiatric investigation. Community samples are particularly informative since many older adults have clinically significant depressive symptoms but fail to meet criteria for major depression and older adults generally do not seek treatment for their depressive symptoms. The primary data used for these analyses were those collected in a community-based survey of over 3000 adults age 65 or older followed for up to ten years. Depressive symptoms were measured by the Center for Epidemiologic Studies-Depression scale (CES-D). Latent class analysis was used to identify clusters of participants based on their symptom profiles at baseline. Mixed models were used to examine trajectories of CES-D scores based on cluster assignment.

A model with three unique clusters best fit the data. Cluster 1 (59%) had a low probability of any symptom endorsement. Cluster 2 (31%) endorsed as a group some negative affect and somatic symptoms but their endorsement of low positive affect did not differ from Cluster 1. Participants in Cluster 3 (10%) had a higher probability of endorsement of all symptoms compared to Clusters 1 and 2. The results did not appreciably differ when symptom severity was included. Cluster assignment was a significant predictor of change in CES-D score over the ten-year follow-up period, and the effects over time differed by sex. Depressive symptom profiles predict the longitudinal course of depression in a community sample of older adults, findings that are important especially in primary care settings.

1. Introduction

As the field of psychiatry moves toward a revised nomenclature there has been considerable discussion surrounding the inherent heterogeneity within diagnoses and the move to include dimensional as well as categorical descriptors in a revised approach (Caine, 2007; Helzer et al., 2006; Kraemer, 2007; Krishnan, 2007; Parker et al., 2012). Depression in particular offers challenges due to its potential social, behavioral, genetic and biological etiologies (Blazer, 2003; Blazer and Hybels, 2005) as well as the documented importance of subsyndromal depression (Judd et al., 1997). Identifying sources of heterogeneity in depressive symptom profiles among adults in community samples remains an important focus of psychiatric investigation. Community samples are particularly informative because a significant number of persons with depressive symptoms do not receive treatment.

Latent class analysis has been a useful tool in grouping individuals who share similar symptom profiles into homogeneous classes that may differ from other classes in their associations with demographic, health and social variables. Many of these investigations have been based on lifetime depressive symptom experiences or only included adults who were currently experiencing clinically significant depressive symptoms. Few studies have examined the longitudinal outcome of these subtypes. For example, investigators using data from the National Epidemiologic Survey of Alcohol and Related Conditions (NESARC) identified four latent classes among adults with a lifetime history of depressive symptoms: 1) a severely depressed class who endorsed most or all of the depressive symptoms; 2) a psychosomatic class who endorsed primarily symptoms such as reduced appetite and sleep disturbance, 3) a cognitive-emotional class who primarily experienced worthlessness or guilt, impaired concentration and suicidal ideation, and 4) a non-depressed class who had low probabilities of endorsing depressive symptoms (Carragher et al., 2009).

Identifying unique depressive subtypes is not new. Kendler et al. (1996) reported from a sample of female twin pairs that depression

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was not etiologically homogeneous but instead made up of several unique syndromes that were distinct from a clinical, longitudinal and genetic perspective. Their research identified seven classes of depressive syndromes including an atypical subtype of depression similar in severity to mild, typical depression but characterized by increased eating, hypersomnia, frequent, relatively short episodes and a proclivity to obesity. They later replicated these findings using the National Comorbidity Survey data (Sullivan et al., 1998). This investigative team also validated earlier findings of distinct subtypes using data from both male–male and male–female twin pairs. The classes were generally on a gradient, with the most severe corresponding to typical major depression, the least severe similar to minor depression and atypical major depression at an intermediate level (Sullivan et al., 2002). Similar findings of heterogeneity in depressive samples have also been reported from community samples of adults (Blazer et al., 1988; Eaton et al., 1989; Chen et al., 2000; Lamers et al., 2010). Lincoln et al. (2007) examined profiles of current depressive symptoms among African Americans and Caribbean Blacks and identified two unique classes: a high symptom and low symptom class. It is not clear whether these profiles would generalize to a more representative population.

Few studies have explored sources of heterogeneity among samples of older adults that included those without a history of depression and focused on current rather than lifetime symptoms. The prevalence of clinically significant depressive symptoms among older adults sampled from both community and clinical populations, however, can be as high as 14% (Beekman et al., 1995; Blazer, 2003; Lyness et al., 1999; Parmelee et al., 1989; Regier et al., 1988; Steffens et al., 2000; Teresi et al., 2001), and depressive symptoms in late life are a significant public health concern with their associated impairments in physical and cognitive functioning as well as increased mortality. In addition, the number of older adults with a history of major depression, bringing a susceptibility to future depression episodes, is expected to increase over the next several decades (Heo et al., 2008).

We recently investigated the structure of late life depression among samples of older patients initially diagnosed with major depression. We reported considerable heterogeneity among patients with this one clinical diagnosis and the existence of three to four distinct latent subtypes, depending on the depression scale used to measure depressive symptoms (Hybels et al., 2011, 2009a). We reported clinical indicators such as depression history may play less of a role differentiating unique clusters of patients than variables such as stress, social support, and functional limitations. We also identified unique depressive symptom clusters in a mixed age sample of patients diagnosed with major depression and found while there were age differences in symptom endorsement, there was not a unique symptom profile specific to late-life depression (Hybels et al., 2012). While the study of latent subtypes of depression in patient samples is clinically informative, most older adults do not seek treatment for their symptoms, and if treatment is sought, it is usually outside of the health care setting, supporting the importance of studying depression symptom profiles in non-clinical populations.

The purpose of the analyses described here was to extend earlier findings from clinical samples by 1) identifying unique clusters of community-dwelling older adults based on their depressive symptom profiles, 2) determining if these clusters could be differentiated by risk factors and correlates of late life depression, 3) determining if symptom severity further distinguished the clusters, and 4) determining whether cluster membership longitudinally predicted trajectories of depressive symptoms. Risk factors included demographic variables, health and functioning variables, and social variables known to be associated with depressive symptoms in older adults (Blazer, 2003; Blazer and Hybels, 2005).

2. Material and methods

2.1. Sample design

The primary data used were those collected for the Duke site of the Established Populations for Epidemiologic Studies of the Elderly (EPESE), a multi-site longitudinal study of community-dwelling older adults age 65 or older followed for up to ten years. The study design has been documented elsewhere (Blazer et al., 1991; Cornoni-Huntley et al., 1990). Briefly, the sample was a multistage area probability sample representative of a five-county area in central North Carolina. Blacks were oversampled and comprised 54% of the baseline sample. A total of 4000 in-person interviews were completed with participants at baseline. An additional 162 interviews were completed by proxy respondents, resulting in an overall baseline response rate of 80%. Follow-up interviews were conducted at three, six, and ten years post baseline. Approximately 50% of the sample was deceased at ten years, but attrition for reasons other than death was minimal. Depression scores were not available for persons who participated by proxy, approximately 8% at three years, 11% at six years, and 15% at ten years. Persons with missing data on any of the depression items or covariates at baseline were excluded. Complete data were available for 3345 participants at baseline (3401 had complete symptom data), 2526 participants at three years, 1847 participants at six years and 1206 participants at ten years. All participants provided written consent, and the study protocol was reviewed and approved annually by the Duke University Institutional Review Board.

2.2. Measures

Depressive symptoms were measured using the Center for Epidemiologic Studies-Depression scale (CES-D) (Radloff, 1977). The Duke EPESE used a modified version containing all 20 items but with participants indicating ($N = 0/Y = 1$) whether they had experienced each symptom the previous week rather than 0–3 as done in the original version. Positive affect items were reverse coded so higher scores indicated symptom presence (Blazer et al., 1991; Hybels et al., 2009b).

Sociodemographic variables included age as a continuous variable, sex, race (Black vs. White/Other with less than 1% Other), <12 years of education vs. 12+, and married vs. not married.

Health and functioning variables included a dichotomous variable indicating mild to moderate cognitive impairment vs. no impairment based on the Short Portable Mental Status Questionnaire (SPMSQ) (Pfeiffer, 1975). Chronic conditions were measured using a summary measure of the presence and impact of heart problems, hypertension, diabetes, stroke, and cancer) (Fillenbaum et al., 1998), with those in the upper third classified as having more conditions. Self-rated health was measured as excellent/good vs. fair/poor. Limitations in basic activities of daily living (ADLs) was measured as needing help with five activities defined by Katz et al. (1970): bathing, dressing, eating, getting from bed to a chair and toileting. Instrumental limitations (IADLs) were measured using five items from the Older Americans Resources and Services (OARS) survey (Fillenbaum, 1988), and included driving/traveling alone, shopping alone, preparing meals, doing housework, and handling money. Mobility was measured using three items from Rosow and Breslau (1966) – doing heavy work, ability to walk up and down stairs and ability to walk half a mile.

Social variables included subjective social support measured by asking participants how much they could count on or talk about