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Social inequalities in depression and suicidal ideation among older primary care patients

Stephen E. Gilman[1], **Martha L. Bruce**[2], **Thomas Ten Have**[3,*], **George S. Alexopoulos**[2], **Benoit H. Mulsant**[4], **Charles F. Reynolds III**[5], and **Alex Cohen**[6]

[1]Department of Society, Human Development and Health, and Department of Epidemiology, Harvard School of Public Health, 677 Huntington Avenue, Boston, MA 02115 USA; Department of Psychiatry, Massachusetts General Hospital, 185 Cambridge Street, Boston, MA 02114 USA

[2]Department of Psychiatry, Weill-Cornell Medical College, 21 Bloomingdale Road, White Plains, NY 10605 USA

[3]Department of Biostatistics and Epidemiology, University of Pennsylvania School of Medicine, 423 Guardian Drive, Philadelphia, PA 19104-6021 USA

[4]Center for Addiction and Mental Health, and Department of Psychiatry, University of Toronto, 1001 Queen Street West, Toronto, Ontario M6J 1H4 Canada

[5]Department of Psychiatry, University of Pittsburgh, 3811 O'Hara Street, Pittsburgh, PA 15213 USA

[6]Faculty of Epidemiology and Population Health, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT United Kingdom

Abstract

Purpose—Depression and suicide are major public health concerns, and are often unrecognized among the elderly. This study investigated social inequalities in depressive symptoms and suicidal ideation among older adults.

Methods—Data come from 1,226 participants in PROSPECT (Prevention of Suicide in Primary Care Elderly: Collaborative Trial), a large primary care-based intervention trial for late-life depression. Linear and logistic regressions were used to analyze depressive symptoms and suicidal ideation over the two-year follow-up period.

Results—Mean Hamilton Depression Rating Scale (HDRS) scores were significantly higher among participants in financial strain (regression coefficient (b)=1.78, 95% confidence interval (CI)=0.67–2.89) and with annual incomes below $20,000 (b=1.67, CI=0.34–3.00). Financial strain was also associated with a higher risk of suicidal ideation (odds ratio=2.35, CI=1.38–3.98).

Conclusions—There exist marked social inequalities in depressive symptoms and suicidal ideation among older adults attending primary care practices, the setting in which depression is most commonly treated. Our results justify continued efforts to understand the mechanisms generating such inequalities, and to recognize and provide effective treatments for depression among high-risk populations.

Correspondence to: Stephen E. Gilman, Harvard School of Public Health, 677 Huntington Avenue, Boston, MA, 02115 USA; phone 617-432-6383; fax 617-432-3755; sgilman@hsph.harvard.edu.
*Deceased

Keywords

Depression; suicide; older adulthood; inequalities; primary care

INTRODUCTION

Social inequalities in major depression originate early in the life course and persist into adulthood [1–3]. In late-life, aspects of inequality that predict a markedly elevated risk of depression include low socioeconomic status and financial strain [4–9]. Defined as insufficient financial resources for meeting one's basic needs, financial strain among older adults has been associated with higher levels of psychological distress, depressive symptoms [10–14], as well as diagnoses of major depression [15].

The inequalities observed primarily in epidemiologic samples have also been linked with worse depression outcomes in treated samples. For example, Cohen et al. have shown that older adults living in low-income neighborhoods: 1) have elevated levels of depressive symptoms and suicidal ideation; and 2) display, relative to older adults living in higher income neighborhoods, decreased response to antidepressant treatment [16–18]. Similarly, Friedman et al. reported that lower educational level predicted worse outcomes during antidepressant treatment [19].

The current study investigates social inequalities in late-life depression and suicidal ideation among primary care patients. This issue is of considerable public health importance given the likelihood that depression will be addressed in the first instance by a primary care provider, and the fact that the majority of depression treatment occurs in the context of primary care. The point prevalence of clinical depression among primary care patients approaches 10%, and has risen to become one of the ten leading conditions diagnosed and treated by primary care clinicians [20]. Sub-threshold depression is even more common in primary care settings, with a point prevalence approaching 20% in some samples [21]. The problem of depression in primary care is particularly relevant for older adults because of its impact on medical burden and disability, its relation with suicide and mortality, and because it is often untreated or inadequately treated [22–25]. Given generally universal access to health care among older adults in the United States, the primary care setting could be one avenue, albeit late in the life course, for reducing social inequalities in the burden of depression, and by implication the physical and mental health consequences of depression [26].

Determining the extent of depression inequalities among primary care patients would extend our knowledge of groups at heightened risk for psychiatric problems, and do so in a clinical settings where there is presumably ready access to psychiatric treatments. Accordingly, the objective of the current study is to expand our understanding of social inequalities in depression and suicidal ideation in the context of primary care. We hypothesize that the socioeconomic factors previously linked with risk for late-life depression in epidemiologic samples will also predict a heightened level of depression and suicidal ideation among older adult primary care patients—in particular, low educational attainment, low income, and financial strain. We also evaluate the roles of medical comorbidity and social support as potential explanatory factors in inequalities. Medical burden has been shown to exacerbate the course of depression [27–29], whereas social support may mitigate it [30–33]; and both of these are patterned by the socioeconomic factors which we examine.

We investigate the presence of social inequalities in the prevalence and course of depressive symptoms and suicidal ideation in the context of PROSPECT (Prevention of Suicide in Primary Care Elderly: Collaborative Trial), a large primary care-based intervention trial for

late-life depression [34]. The PROSPECT trial presents a unique resource for investigating social inequalities because of a diverse study population ascertained from 20 primary care practices in three geographic locations, random selection of primary care patients for participation, systematic detection and assessment of depressive symptoms and suicidal ideation, longitudinal follow-up of participants over a two-year period, and the ability to exclude differential access to treatment as a potential confounding factor.

METHODS

Study cohort

The design of the PROSPECT trial, and the effectiveness of the PROSPECT intervention through the 24-month follow-up period, have been reported previously [35,36,34,37]. In practices randomized to the intervention arm, a depression care manager interfaced with patients and providers to ensure guideline-based provision of depression treatment (e.g., treatment with citalopram or interpersonal psychotherapy) and follow-up care throughout the study period. In practices randomized to the usual care arm, participants' physicians received educational materials regarding geriatric depression, written notices of depression diagnoses, and contacts made by the investigators when the study personnel detected a significant suicide risk. All participants gave written informed consent prior to their enrollment in the study. The PROSPECT study was approved by the Institutional Review Boards of Cornell University, University of Pennsylvania, and University of Pittsburgh. Data analysis for the current study was approved by the Institutional Review Board of Harvard School of Public Health.

Whereas prior reports from PROSPECT have focused on participants who, at baseline, had clinically significant depressive symptoms, the current study includes all participants enrolled and followed over the course of the study, and investigates the naturalistic course of depression and suicidal ideation in relation to social factors. We therefore analyze the PROSPECT data as an observational study, and take advantage of the diverse sampling frame and the systematic detection and repeated assessments by mental health professionals of depression and suicidal ideation.

As described previously, the PROSPECT study was conducted in 20 primary care practices in the metropolitan areas of New York City, Philadelphia, and Pittsburgh [34]. Primary care patients ≥60 years old and with a Mini-Mental State Examination score ≥18 were eligible for enrollment into the study. Patients with scores >20 on the Center for Epidemiologic Studies Depression scale, or with a history of depression or depression treatment, were oversampled. Bruce et al. have described the recruitment procedures in detail [34]. The participation rate was 65.6% of all eligible patients, resulting in a sample size of 1,226. Individual participants were enrolled for a period of 2 years, with post-baseline assessments made at 4, 8, 12, 18, and 24 months. The current analyses assessed depressive symptoms and the presence of suicidal ideation at each follow-up assessment in relation to participants' socioeconomic status (educational attainment, income, and financial strain), demographic characteristics (age, race, and marital status), overall medical burden, and availability of social supports.

Measures

Depressive symptoms were assessed at each study visit using the Hamilton Depression Rating Scale (HDRS) [38]. Suicidal ideation at each visit was assessed using both the HDRS and the Scale for Suicidal Ideation (SSI) [39]. Suicidal ideation was coded as present based on a score ≥1 on either the SSI or the suicide item of the HDRS (item #11).

Participant demographic factors were assessed at baseline and again at months 12 and 24. In the longitudinal analyses described below, demographic factors were updated to reflect any changes that were reported at these 2 time points. Age at baseline was categorized as ≥75 vs. 60–74. Race was categorized as White, Black, or Other. Educational attainment was categorized as <12 years, 12 years, 13–15 years, or ≥16 years. Annual income was coded in tertiles as follows: <$20,000, $20,001–$74,999, and ≥$75,000. In addition to income, our analyses included a measure of financial strain, which was coded positive if participants responded, "Can't make ends meet" to a question asking about their current money situation. Financial strain reflects an individual's income relative to his or her needs, and has been shown to predict depression independently from income among older adults [10]

Social support and medical comorbidity, assessed at baseline and reassessed at months 12 and 24, were included in the analyses due to their strong associations with depression [30,36]. Social support was based on the Duke Social Support Index (DSSI), which yielded scores on the following dimensions of support: social interaction, subjective social support, and instrumental support [40]. Overall medical burden was based on the Charlson Comorbidity Index [41].

Statistical analyses

We used random effects models to relate mean levels of depressive symptoms (using linear regression) and the likelihood of suicidal ideation (using logistic regression) at each study visit to participant demographic factors, socioeconomic status, social support, and medical comorbidity. The random effect that was included in the models was a subject-specific intercept, which accounted for within-subject variability in depressive symptoms or suicidal ideation over the course of the study. Random effects for primary care practices were not necessary given that the within-practice correlations of depression and suicidal ideation were negligible [34]. The linear random effects models were fitted using PROC MIXED, and the logistic random effects models were fitted using PROC GLIMMIX (using maximum likelihood estimation with adaptive quadrature), in SAS v9.2. For each dependent variable, we fitted a sequence of 5 models, adding successive blocks of covariates beginning with a demographics only model (age, race, sex, marital status, and educational attainment), and subsequently adding income (model 2), financial strain (model 3), medical comorbidity (model 4), and social support (model 5). With this sequence we assessed whether income, financial strain, medical comorbidity, and social support accounted for some of the association between the demographic factors and outcomes. All models included controls for site (New York, Philadelphia, or Pittsburgh) and intervention status.

We used multiple imputation to handle missing data that occurred either through item non-response or because of missed visits or attrition. This approach retains all observed data in the analyses, and to the extent that observed data are informative about the likelihood of missingness, yields results that are less biased than would be obtained from a complete-case analysis. The decision rule that we adopted for the PROSPECT trial was to impute all missing data up until a reported death [42]. The maximum number of theoretically observable person-visits was 7,356 (1,226 participants observed 6 times). However, 64 deaths were recorded over the study period, which reduced the total number of person-visits by 181, and yielded a final sample size of 7,175 person-visits in the longitudinal analyses. Of these, 5,658 person-visits were observed (78.9%), and the remainder was imputed. Imputations were done using the method of chained equations as implemented in IVEWare [43]. All analyses were conducted separately within each of 20 multiply imputed datasets, and the results were combined using the MIANALYZE procedure in SAS in order to account for sampling variability across the imputed datasets.

RESULTS

Participants in the PROSPECT study were predominantly female (69.9%) and <75 years of age (63.9%). The sample was diverse with respect to race/ethnicity (27.6% Black or African American) and educational attainment (24.7% with ≥16 years of education). The distribution of demographic factors and socioeconomic status in the sample is shown in the first column of Table 1. Mean HDRS scores, and the proportion of participants with suicidal ideation, across all study variables are shown in the second and third columns of Table 1, respectively. The general pattern that emerges at baseline is lower HDRS scores, and a lower risk of suicidal ideation, among PROSPECT participants in the highest educational category, highest income category, and not reporting financial strain.

Trends in the relationship of socioeconomic indicators with HDRS scores and suicidal ideation over the course of the PROSPECT study are illustrated in Figure 1. The overall trends in depressive symptoms and suicidal ideation reflect higher levels at baseline and subsequent decreases in symptoms over the course of the follow-up period. This is expected given that participants with higher levels of depressive symptoms were preferentially selected for participation in the PROSPECT trial [35,36,34,37]. However, when stratified by socioeconomic status, both mean HDRS scores and the prevalence of suicidal ideation were significantly higher at baseline and throughout the follow-up period among individuals who reported financial strain (graphs A ($t=6.0$, $p<0.001$) and C ($t=4.9$, $p<0.001$)), or lower levels of education (graphs B ($F=12.2$, $p<0.001$) and D ($F=4.1$, $p=0.006$)). The magnitude of differences in depressive symptoms and in suicidal ideation was more pronounced when plotted by financial strain than education.

The mean (SE) HDRS at baseline in the sample is 11.4 (0.2). Results of longitudinal models for mean HDRS scores over the course of the PROSPECT study are presented in Table 2. Linear regression coefficients and corresponding 95% confidence intervals are presented from each of 5 models. Coefficients with a positive sign indicate factors associated with higher average HDRS scores over the course of the study. In the demographics only model (model 1), participants who were divorced or separated had significantly higher mean levels of depressive symptoms over the course of the trial, as did participants with less than high school or high school educations. However, when accounting for income, the magnitude of the regression coefficients for divorced or separated marital status were substantially reduced (model 2), suggesting that marital status differences in depressive symptoms are partly explained by differences in income. Financial strain, added in model 3, was also significantly associated with depressive symptoms. It is notable in model 3 that both financial strain and low income (<$20,000 annually) were independently associated with depressive symptoms, with regression coefficients of a similar magnitude. In model 4, higher levels of physical illness according to the Charlson Comorbidity Index were associated with higher mean HDRS scores. The final model (model 5) added the Duke Social Support Scales, two of which were significantly associated with depressive symptoms. Higher scores on the scales of social interaction and subjective social support were associated with lower mean HDRS scores over the course of the PROSPECT trial. Less than high school or high school education remained significant predictors of elevated HDRS scores in the final model, although the magnitude of the differences in HDRS between individuals in these two education categories relative to individuals with a college degree was substantially smaller in the final model (1.24 and 1.25, respectively) than in model 1 (2.88 and 2.13, respectively). In the final model, financial strain and annual incomes below $20,000 were associated with significantly higher mean HDRS scores over the course of the trial (coefficient for financial strain=1.78, CI=0.67, 2.89; for low income, coefficient=1.67, CI=0.34, 3.00).

We then fitted a similar sequence of regression models for suicidal ideation during the PROSPECT trial. The odds ratios from these mixed-effects logistic regression models are presented in Table 3. The pattern of results of the analyses of suicidal ideation was similar to the results obtained in the models of mean HDRS scores. In the model for demographic factors, lower levels of education, and divorced, widowed, and never married marital statuses, were associated with a higher odds of suicidal symptoms; yet these associations were attenuated in subsequent models that added measures of economic resources (primarily income). In the final model (model 5), financial strain was associated with a significantly higher odds of suicidal symptoms (odds ratio=2.35, CI=1.38, 3.98); physical illness at baseline was associated with a higher odds of suicidal symptoms; and higher scores on the scales of social interaction and subjective support were associated with a lower odds of suicidal symptoms.

DISCUSSION

In a longitudinal sample of older primary care patients, there were significant social inequalities in the prevalence and course of depression and suicidal ideation over a two-year period. The most important finding of our study is that lower income and financial strain were associated with higher levels of depressive symptoms, as well as an increased risk of suicidal ideation. The impact of financial strain on depression was independent of other demographic factors, including participants' actual income level. Among older adults, current income may not reflect economic resources that derive from an individual or family's accumulated wealth and assets [44]. Financial strain reflects the balance between income and needs, and therefore is more indicative of current economic hardship. It has been shown to predict older adulthood depression in prior community and clinical samples [45,10], and is one likely explanatory factor for the associations of unemployment and widowhood with depression [14,46]. In this regard, marital status differences in depressive symptoms and suicidal ideation in PROSPECT were substantially attenuated when accounting for financial strain.

The measurement of financial strain in PROSPECT, and in most prior studies, incorporates an individual's subjective valuation of their economic situation that may be partly driven by anxiety over finances. In PROSPECT, financial strain was assessed at baseline, and was predictive of depressive symptoms and suicidal ideation over a 2-year period. This design confirms and extends the results of prior cross-sectional studies that reported associations between financial strain and depression. However, self-reports of financial strain could be distorted by current symptomatology [47]. More objective assessments of financial strain are rare; one exception is a study by Zimmerman and Katon, in which the definition of financial strain used was the ratio of debt to assets; they also found financial strain to be associated with depression independently from income [12].

Overall medical burden was also associated with a higher level of depressive symptoms as well as an increased risk of suicidal ideation, as reported previously among a subset of participants in the current sample as well as in other studies [36,48]. The psychiatric consequences of medical conditions are well documented [49], and it has been suggested that treating medical conditions may lead to reductions in the risk of depression (e.g., treatment for cardiovascular risk factors); however, this remains to be shown in experimental studies. The relevance of this finding for the current investigation is that social inequalities in depressive symptoms and suicidal ideation were not accounted for by inequalities in general medical burden.

There is considerable evidence of the importance of social support for mental health, and on the association between low social support and both depression and suicidality [50,30]. The

evidence is somewhat mixed as to whether differences in social support explain economic inequalities in depression [51,52]. In our study, they did not. Associations of financial strain, income, and education with depressive symptoms and suicidal ideation were largely unchanged after adding social support to the regression models. It is notable that the dimensions of social support that were significantly related to depression were the more cognitively oriented dimensions of support—social interaction and subjective support—rather than instrumental support, defined as receiving help in a wide range of areas from family or friends. Social support-based interventions might be beneficial for reducing depressive symptoms [53], though it is unlikely that improving social support will significantly mitigate the adverse mental health consequences of socioeconomic deprivation or other stressful life events.

This study illustrates a pattern of associations that is consistent with the accumulation of socioeconomic disparities in depression over the life course. Lower educational attainment, a marker of socioeconomic status established in young adulthood, was strongly associated with depression—yet this association was reduced when controlling for current income and financial strain. This finding is consistent with theory and empirical evidence in the area of life course epidemiology arguing that the social determinants of health observed in older adulthood reflect not only the consequences of current social circumstances, but also the consequences of socioeconomic disadvantage experienced over many years [54,55]. This evidence would also argue that the mechanisms that generate inequalities in depression in older adulthood, as well as points of intervention for reducing such inequalities, may be identifiable early in the life course.

Strengths of the PROSPECT trial for investigating social inequalities in depression among older adult primary care patients include the diversity of participants enrolled, validated measures used to assess depression and suicidal symptoms, and the random selection of primary care patients for participation rather than selection by physician or self-referral. With few exceptions [56], prior studies of depression in primary care settings that were based on larger samples focused on diagnosed depression or depression based on screening instruments rather than clinician-administered measures of depression such as the HDRS, as was used in the current study.

While PROSPECT was an experimental study [37,34], our analysis of the social determinants of depression was observational, and therefore is subject to the usual limitations of observational research. Our results cannot be interpreted as estimates of causal associations, which means that we cannot establish solely from these results whether reducing financial strain will have the effect of ameliorating depressive symptoms. Another limitations is the potential confounding effects of unmeasured variables, including the effect of prior depression on lifetime earnings.

Conclusions

Social inequalities in the prevalence and course of depressive symptoms and suicidal ideation demonstrated in community samples exist among patients attending primary care practices, the clinical setting in which most depression is treated. These inequalities persisted over the two-year duration of the PROSPECT study (as illustrated in Figure 1). Depression among older adults is often chronic [57,58], and the results of the current study would suggest that this chronicity is exacerbated by economic disadvantage.

The results of this study could not be attributed to differential health care access, given that all study participants had access to primary care. However, future work is needed to determine the extent to which socioeconomic inequalities exist in antidepressant treatment outcomes [18]. Based on our findings, self-report of financial strain identifies such a

population: in our study, those reporting strain continued to have, on average, clinically significant depressive symptoms as indicated by HDRS scores >10. Additional work is needed to determine whether targeting populations shown to be at elevated risk for depression on the basis of social and economic factors can mitigate disease onset or recurrence [59,60], as well as maximize the effectiveness of depression treatments [61].

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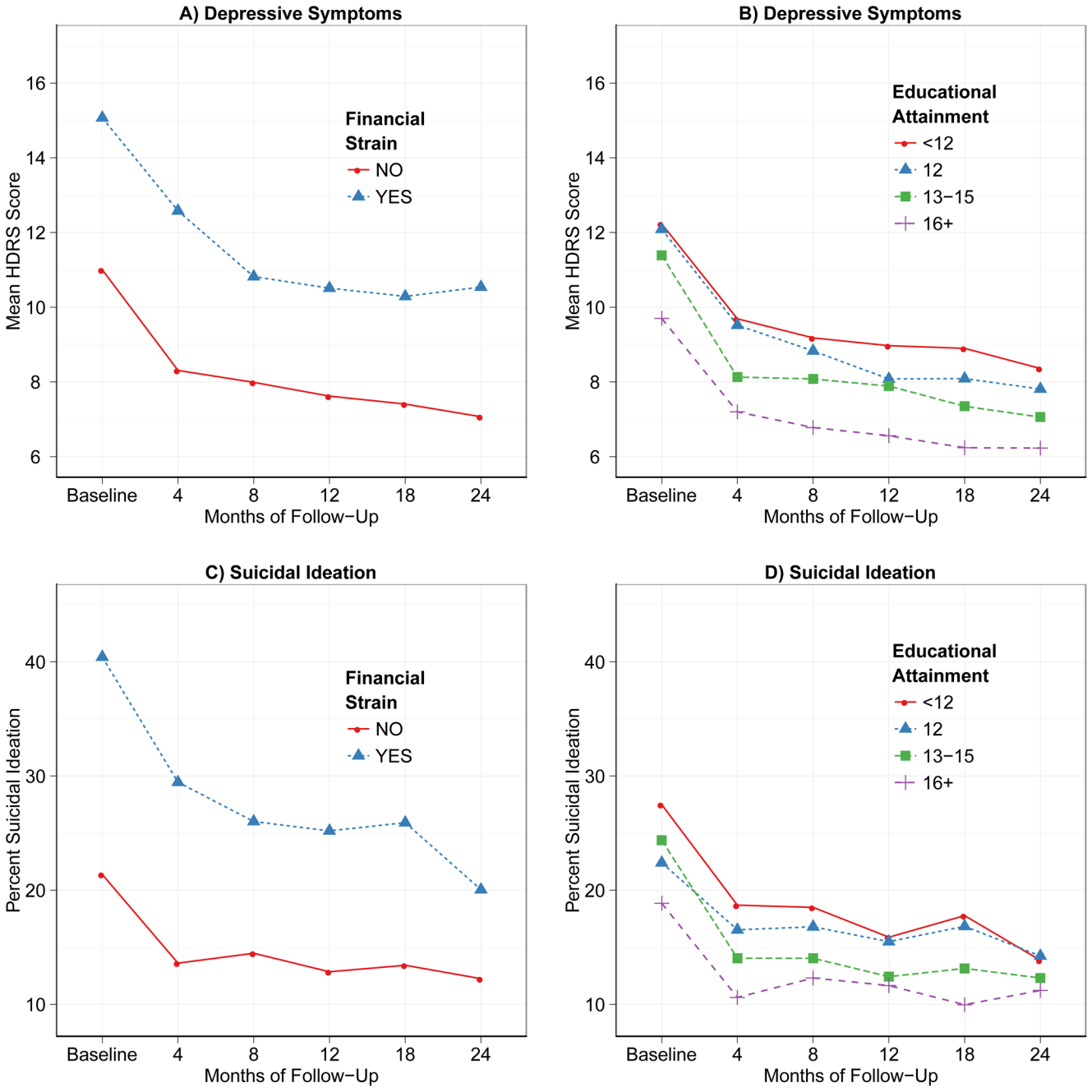

Figure 1.

Mean Hamilton Depression Rating Scale (HDRS) scores (panels A and B), and proportion of participants with suicidal ideation (panels C and D) over the two-year follow-up period in the PROSPECT trial (n=1,226). Means and proportions are presented separately according to financial strain (panels A and C) and educational attainment (panels B and D).

Table 1

Social and demographic characteristics of participants in the PROSPECT sample (n=1,226)

	Number of participants	Sample distribution, Percent (SE)	HDRS Score at Baseline, Mean (SE)	Suicidal Ideation at Baseline, Percent (SE)
Total	1226	100%	11.4 (0.2)	23.3 (1.2)
Age				
≥75	443	36.1 (1.4)	12.2 (0.3)	24.3 (1.5)
60–74	783	63.9 (1.4)	9.9 (0.4)	21.4 (2.0)
Race/ethnicity				
Non-Hispanic White	852	69.5 (1.3)	11.4 (0.3)	24.2 (1.5)
Black or African American	339	27.6 (1.3)	11.5 (0.4)	21.3 (2.2)
Other	35	2.9 (0.5)	11.3 (1.4)	19.9 (6.7)
Sex				
Male	368	30.1 (1.3)	11.0 (0.5)	23.3 (2.2)
Female	858	70.0 (1.3)	11.6 (0.3)	23.2 (1.4)
Education				
<12	322	26.2 (1.3)	12.2 (0.5)	27.5 (2.5)
12	367	29.9 (1.3)	12.1 (0.4)	22.4 (2.2)
13–15	235	19.2 (1.1)	11.4 (0.5)	24.4 (2.8)
16+	302	24.7 (1.2)	9.7 (0.4)	18.9 (2.3)
Marital status				
Married	472	38.5 (1.4)	11.1 (0.4)	21.5 (1.9)
Widowed	400	32.7 (1.3)	10.9 (0.4)	22.0 (2.1)
Separated	63	5.2 (0.6)	13.9 (1.1)	31.8 (5.9)
Divorced	173	14.1 (1.0)	12.7 (0.7)	25.0 (3.3)
Never married	117	9.6 (0.8)	11.2 (0.7)	27.4 (4.1)
Financial strain (can’t make ends meat)				
Yes	120	9.8 (1.2)	15.1 (0.8)	40.4 (4.6)
No	1106	90.2 (1.2)	11.0 (0.3)	21.4 (1.3)
Income				
<20,000	569	46.4 (2.3)	12.4 (0.4)	27.4 (2.0)
20,001–75,000	451	36.8 (2.3)	10.9 (0.4)	21.1 (2.1)
>75,000	206	16.8 (2.0)	9.8 (0.8)	16.2 (3.3)
Site				
New York	467	38.1 (1.4)	9.8 (0.4)	18.4 (1.8)
Philadelphia	426	34.8 (1.4)	11.6 (0.4)	23.7 (2.1)
Pittsburgh	333	27.2 (1.3)	13.4 (0.5)	29.4 (2.5)
Intervention Status				
Intervention	609	49.7 (1.4)	12.0 (0.3)	25.1 (1.8)
Control	617	50.3 (1.4)	10.8 (0.3)	21.4 (1.7)

Table 2

Results of linear regression models of mean HDRS scores across the 2-year duration of the PROSPECT trial[a]

	Model 1 Coefficient (CI)[b]	Model 2 Coefficient (CI)[b]	Model 3 Coefficient (CI)[b]	Model 4 Coefficient (CI)[b]	Model 5 Coefficient (CI)[b]
Age	−0.15 (−0.19, −0.11)	−0.16 (−0.20, −0.11)	−0.15 (−0.19, −0.10)	−0.14 (−0.19, −0.10)	−0.13 (−0.17, −0.09)
Race/ethnicity					
Non-Hispanic White	Reference	Reference	Reference	Reference	Reference
Black or African American	−0.52 (−1.34, 0.30)	−0.72 (−1.54, 0.10)	−0.80 (−1.61, 0.01)	−0.94 (−1.74, −0.15)	−0.89 (−1.66, −0.13)
Other	−0.57 (−2.54, 1.40)	−0.66 (−2.63, 1.31)	−0.68 (−2.63, 1.28)	−0.82 (−2.73, 1.09)	−0.78 (−2.63, 1.06)
Sex					
Male	Reference	Reference	Reference	Reference	Reference
Female	0.35 (−0.37, 1.08)	0.25 (−0.48, 0.99)	0.30 (−0.42, 1.02)	0.38 (−0.33, 1.08)	0.49 (−0.19, 1.17)
Marital status					
Married	Reference	Reference	Reference	Reference	Reference
Divorced	1.53 (0.56, 2.50)	0.85 (−0.19, 1.88)	0.72 (−0.31, 1.75)	0.78 (−0.23, 1.79)	0.66 (−0.30, 1.62)
Separated	1.76 (0.25, 3.28)	1.11 (−0.42, 2.65)	0.94 (−0.59, 2.48)	0.79 (−0.73, 2.30)	0.66 (−0.79, 2.12)
Widowed	0.61 (−0.20, 1.43)	0.09 (−0.78, 0.96)	0.11 (−0.76, 0.99)	0.16 (−0.69, 1.01)	0.25 (−0.58, 1.08)
Never married	1.08 (−0.06, 2.23)	0.51 (−0.66, 1.69)	0.40 (−0.77, 1.57)	0.39 (−0.75, 1.53)	0.17 (−0.94, 1.28)
Educational attainment					
Less than high school	2.88 (1.95, 3.81)	1.86 (0.75, 2.98)	1.82 (0.71, 2.92)	1.59 (0.52, 2.65)	1.24 (0.23, 2.25)
High school	2.13 (1.26, 3.00)	1.48 (0.50, 2.47)	1.52 (0.54, 2.50)	1.42 (0.47, 2.36)	1.25 (0.34, 2.15)
Some college	1.10 (0.14, 2.06)	0.77 (−0.21, 1.75)	0.83 (−0.15, 1.81)	0.79 (−0.16, 1.75)	0.63 (−0.29, 1.54)
College degree	Reference	Reference	Reference	Reference	Reference
Income					
<20,000		2.33 (0.94, 3.72)	2.05 (0.61, 3.50)	1.88 (0.48, 3.27)	1.67 (0.34, 3.00)
20,001–75,000		0.47 (−0.68, 1.62)	0.42 (−0.74, 1.57)	0.36 (−0.74, 1.45)	0.28 (−0.77, 1.32)
>75,000		Reference	Reference	Reference	Reference
Financial strain (can't make ends meet)					
Yes			2.16 (0.99, 3.33)	1.96 (0.82, 3.10)	1.78 (0.67, 2.89)
No			Reference	Reference	Reference
Charlson Comorbidity Index				0.36 (0.25, 0.47)	0.34 (0.23, 0.45)
Duke Social Interaction Score					−0.24 (−0.32, −0.16)

	Model 1 Coefficient (CI)[b]	Model 2 Coefficient (CI)[b]	Model 3 Coefficient (CI)[b]	Model 4 Coefficient (CI)[b]	Model 5 Coefficient (CI)[b]
Duke Subjective Support Score					−0.24 (−0.30, −0.18)
Duke Instrumental Support Score					0.03 (−0.05, 0.11)

[a] Regression models include data from 1,226 individuals observed across 6 waves of the PROSPECT trial. Site and intervention status also included in each model, along with random intercepts for each subject.

[b] 95% confidence interval.

Table 3

Results of logistic regression models of suicidal ideation across the 2-year duration of the PROSPECT trial[a]

	Model 1 OR (CI)[b]	Model 2 OR (CI)[b]	Model 3 OR (CI)[b]	Model 4 OR (CI)[b]	Model 5 OR (CI)[b]
Age	0.99 (0.97, 1.01)	0.98 (0.96, 1.01)	0.99 (0.97, 1.01)	0.99 (0.97, 1.01)	0.99 (0.97, 1.01)
Race/ethnicity					
Non-Hispanic White	Reference	Reference	Reference	Reference	Reference
Black or African American	0.71 (0.45, 1.12)	0.67 (0.42, 1.04)	0.64 (0.41, 0.99)	0.60 (0.38, 0.93)	0.61 (0.40, 0.94)
Other	0.51 (0.18, 1.44)	0.50 (0.18, 1.40)	0.51 (0.18, 1.39)	0.47 (0.17, 1.29)	0.51 (0.19, 1.32)
Sex					
Male[c]	Reference	Reference	Reference	Reference	Reference
Female	0.96 (0.65, 1.42)	0.90 (0.60, 1.35)	0.92 (0.62, 1.38)	0.95 (0.64, 1.42)	1.03 (0.70, 1.52)
Marital status					
Married[c]	Reference	Reference	Reference	Reference	Reference
Divorced	1.67 (1.00, 2.81)	1.18 (0.68, 2.06)	1.11 (0.64, 1.93)	1.14 (0.66, 1.98)	1.01 (0.60, 1.70)
Separated	1.98 (0.90, 4.34)	1.47 (0.67, 3.26)	1.33 (0.61, 2.91)	1.25 (0.58, 2.71)	1.12 (0.53, 2.35)
Widowed	1.52 (1.01, 2.28)	1.20 (0.77, 1.87)	1.23 (0.79, 1.92)	1.24 (0.80, 1.92)	1.26 (0.83, 1.92)
Never married	2.78 (1.47, 5.26)	2.15 (1.14, 4.06)	2.00 (1.07, 3.74)	1.99 (1.07, 3.71)	1.71 (0.93, 3.14)
Education					
Less than high school	2.25 (1.37, 3.69)	1.46 (0.81, 2.65)	1.41 (0.78, 2.53)	1.30 (0.73, 2.32)	1.13 (0.65, 1.95)
High school	1.66 (1.05, 2.63)	1.25 (0.76, 2.06)	1.25 (0.76, 2.05)	1.21 (0.74, 1.97)	1.12 (0.70, 1.79)
Some college	1.31 (0.79, 2.19)	1.15 (0.68, 1.95)	1.18 (0.70, 1.97)	1.16 (0.69, 1.94)	1.06 (0.65, 1.73)
College degree[c]	Reference	Reference	Reference	Reference	Reference
Income					
<20,000		2.82 (1.27, 6.27)	2.41 (1.06, 5.44)	2.28 (1.02, 5.12)	2.07 (0.94, 4.56)
20,001–75,000		1.28 (0.69, 2.38)	1.26 (0.70, 2.28)	1.22 (0.68, 2.18)	1.17 (0.66, 2.06)
>75,000[c]		Reference	Reference	Reference	Reference
Financial strain (can't make ends meet)					
Yes			2.90 (1.68, 5.00)	2.65 (1.55, 4.54)	2.35 (1.38, 3.98)
No[c]			Reference	Reference	Reference
Charlson Comorbidity Index				1.13 (1.07, 1.21)	1.12 (1.05, 1.19)
Duke Social Interaction Score					0.90 (0.86, 0.95)

	Model 1 OR (CI)[b]	Model 2 OR (CI)[b]	Model 3 OR (CI)[b]	Model 4 OR (CI)[b]	Model 5 OR (CI)[b]
Duke Subjective Support Score					0.90 (0.86, 0.95)
Duke Instrumental Support Score					0.99 (0.94, 1.05)

[a] Logistic regression models include data from 1,226 individuals observed across 6 waves of the PROSPECT trial. Site and intervention status also included in each model, along with random intercepts for each subject.

[b] Odds ratio, 95% confidence interval.