Supplementary Online Content


eText. Secondary Analyses of Outcomes Stratified by Medication Class and Baseline Symptom Severity

**eFigure 1.** Group Differences in Overall MH Functioning Stratified by Baseline Symptom Severity

**eFigure 2.** Group Differences in Depressive Symptoms Stratified by Medication Class and Baseline Symptom Severity

**eFigure 3.** Group Differences in Anxiety Symptoms Stratified by Medication Class and Baseline Symptom Severity

This supplementary material has been provided by the authors to give readers additional information about their work.
Secondary Analyses of Outcomes Stratified by Medication Class and Baseline Symptom Severity

Analytic Plan

Secondary analyses included analysis of associations among variables stratified by index medication type (i.e., depression and anxiety symptoms were analyzed among those started on an antidepressant and anxiolytic, respectively). Moreover, in order to examine whether MH functioning and symptom changes over time were more pronounced among those with higher baseline symptoms, we ran separate models for individuals who met clinically significant criteria for moderate-severe symptom severity (i.e., PHQ-9 or GAD-7 score of 10 or more) at baseline. Finally, in order to examine group differences in remission rates among individuals scoring in the moderate-severe symptom range at baseline, we ran a series of adjusted, generalized linear models in which remission (i.e., PHQ-9 or GAD-7 score less than 5 at follow-up) was specified as a binary outcome. Models of continuous outcomes and remission rates were run using the PROC MIXED and GENMOD procedures, respectively (SAS v9.2).

Results

Overall MH functioning: While the main effects for time were retained among subsets of individuals prescribed antidepressants (F(2, 800)=42.99, p<0.001) and anxiolytics (F(2, 545)=8.52, p≤0.001), the significant time*treatment group interaction effect was observed for those prescribed an antidepressant (b=2.61 (SE=0.89), t(800)=2.94, p=0.003), but not for those prescribed an anxiolytic.

The pattern of findings outlined above was largely retained when selecting those cases who reported moderate-severe symptoms at baseline. Among individuals who reported baseline PHQ-9 scores of 10 or greater, there was a significant main effect for time (F(2, 492)=48.40, p<0.001). The same was true of those with moderate-severe depressive symptoms prescribed an antidepressant (F (2, 300)=35.25, p≤0.001). Further analyses revealed significant time*treatment group effects: there was a greater increase in MH functioning at 6 months relative to baseline for those in the Care Management arm both in the full sample (b=3.39 (SE=1.31), t(492)=2.58, p=0.01) (eFigure 1, top panel) and among those prescribed an antidepressant (b=4.97 (SE=1.65), t(300)=3.02, p=0.003).

Analysis of individuals with moderate-severe anxiety symptoms at baseline yielded a significant, positive main effect for time both in the full sample (F (2, 167)=20.73, p≤0.001) and among those prescribed an anxiolytic (F (2, 66)=5.85, p=0.01). However, there were no group differences in change over time among those with moderate-high anxiety, regardless of index medication type (eFigure 2, bottom panel).

Depressive symptoms: The main effect for time (F(2, 813)=154.89, p≤0.001) and time*treatment group interaction effect (F(2, 813)=7.03, p≤0.001) were retained when examining the subset of individuals prescribed an antidepressant (b=−1.52 (SE=0.40), t(813)=−3.75, p≤0.001) (eFigure 2, top panel). When selecting individuals who had PHQ-9 scores greater than or equal to 10 (i.e., moderate-severe depressive symptoms), a similar pattern of findings emerged. There was a significant main effect for time in both the full sample of individuals with PHQ-9 ≥ 10 (F (2, 495)=245.34, p≤0.001) as well as those prescribed an antidepressant (F (2, 302)=161.64, p≤0.001) (eFigure 2, bottom panel). Additionally, there were significant time*treatment group interaction effects for the full sample of individuals with PHQ-9 ≥ 10 (F (2, 495)=7.56, p≤0.001) and antidepressant subgroup (F (2, 302)=5.97, p=0.003). Among the full sample of individuals with PHQ-9 ≥ 10, compared to individuals assigned to Monitoring Alone, those assigned to the Care Management arm who had significantly greater reductions in depressive symptoms at both 3 (b=−1.43 (SE=0.56), t(495)=−2.54, p=0.01) and 6 month (b=−2.13 (SE=0.57), t(495)=−3.74, p≤0.001) follow-up relative to baseline. Among the subset of individuals prescribed an antidepressant, those in Care Management showed greater reductions in depressive symptoms at 6 month follow-up relative to those in Monitoring Alone (b=−2.48 (SE=0.72), t(302)=−3.44, p≤0.001).

Examination of depressive symptom remission rates among individuals scoring greater than or equal to 10 at baseline revealed both a significant main effect for time (b=−0.73 (SE=0.29), 95% CI (-1.30, -0.16), z=−2.49, p=0.01) and time*treatment group interaction effect (b=0.90 (SE=0.38), 95% CI (0.17, 1.64), z=2.40, p=0.02) at 6 relative to 3 month follow-up for those prescribed an antidepressant. Specifically, those in the Care Management arm prescribed an antidepressant were significantly more likely to show remission (PHQ-9 score <5) in depressive symptoms at 6 months when compared to those in Monitoring Alone. There were no significant differences when examining the overall group as a whole.

Anxiety symptoms: Significant group differences from baseline to 6 month follow-up were retained when stratifying by index medication type (time*treatment group: F(2, 552)=5.86, p=0.003); individuals in the Care Management arm prescribed an anxiolytic showed greater reductions at 6 month follow-up relative to Monitoring Alone (b=−1.41 (SE=0.41), t(552)=−3.41, p≤0.001) (eFigure 3, top panel).
Analysis of individuals who reported moderate-severe anxiety symptoms (i.e., GAD-7 ≥ 10) at baseline revealed a significant main effect for time both for the full sample (F (2, 168)=162.69, p<0.001) and those specifically prescribed an anxiolytic (F (2, 68)=62.70, p<0.001) (eFigure 3, bottom panel). Nonetheless, there were no significant time*treatment group interactions observed among these groups. Examination of anxiety remission rates among individuals scoring greater than or equal to 10 at baseline revealed both a significant main effect for time and time*treatment group interaction effect (b=1.11 (SE=0.54), 95% CI (0.06, 2.17), z=2.07, p=0.04) at 6 relative to 3 month follow-up for the full sample. Specifically, those in the Care Management arm were significantly more likely to show remission in anxiety symptoms at 6 months when compared to those in Monitoring Alone. Of note, we could not test remission rates among the subset of individuals prescribed an anxiolytic due to insufficient sample size.

Discussion

In support of the primary hypotheses, most of the secondary analyses yielded similar outcomes to those described in the main text. Group differences were observed in improvements in MH functioning. Differences also were observed in depressive symptoms in the full sample and retained when examining those individuals prescribed an antidepressant and those with moderate-severe baseline depressive symptoms. However, while significant group differences in change in anxiety symptoms were observed when examining the full sample, they were not retained among the subsample of individuals with moderate-severe baseline anxiety symptoms prescribed an anxiolytic. Nonetheless, individuals with moderate-severe baseline anxiety (regardless of index medication type) assigned to the Care Management arm were more likely to show remission of symptoms at 6 months.

The differential findings observed in the secondary analyses may be attributed to a number of factors. It is possible that MH symptom monitoring plus intensive care management is particularly effective when managing depressive symptoms regardless of symptom severity and drug type because depressive symptoms are especially responsive to care management strategies, which range from referral to community services and resources, to psychosocial education and support, to algorithm-based suggestions for pharmacologic intervention. On the other hand, anxiety symptoms and overall MH functioning among older adults with more severe baseline anxiety prescribed an anxiolytic may be adequately addressed with monitoring alone. It is important to note, however, that these findings may be better understood had we had knowledge of the indication for the initial anxiolytic prescription and the degree of comorbidity between anxiety and depressive symptoms in the two medication groups. In certain cases the care managers may also recommend discontinuation of the anxiolytic in favor of an antidepressant particularly in individuals with moderate to severe depression. Furthermore, our limited sample size of individuals prescribed an anxiolytic with moderate-severe baseline symptoms may have limited the power to observe otherwise significant effects. Nonetheless, these findings lend support to the primary study aim that the content (e.g., symptom monitoring, psychosocial counseling, pharmacologic intervention, service connection) and intensity (monitoring alone vs. monitoring plus more aggressive care management) of the collaborative MH care intervention might best be tailored according to older adults’ specific needs and symptom profiles. Examining situations in which symptom monitoring alone, which requires less investment of resources, time, and personnel than monitoring plus care management, is associated with favorable individual outcomes is an area worthy of future work.
**Figure 1.** Group Differences in Overall MH Functioning Stratified by Baseline Symptom Severity

Note. Figure presents estimated mean values from intention-to-treat, mixed effects linear regression model of longitudinal change in overall MH functioning (SF12 MCS score) at 3 and 6 months, relative to baseline (Time 0). Higher scores denote better MH functioning. The top panel presents results from analysis of the subset of the full sample with moderate-severe baseline depression symptoms (PHQ-9 > 10). The bottom panel presents results from analysis of the subset of the full sample with moderate-severe baseline anxiety symptoms (GAD-7 > 10). There was a significant time*treatment group effect for those with moderate-severe baseline depression, whereby MH functioning increased more from baseline to 6 months in the Care Management vs. Monitoring Alone arm (b=3.39 (SE=1.31), t(492)=2.58, p=0.01).
eFigure 2. Group Differences in Depressive Symptoms Stratified by Medication Class and Baseline Symptom Severity

Note. Figure presents estimated mean values from intention-to-treat, mixed effects linear regression model of longitudinal change in depressive symptoms (PHQ-9 score) at 3 and 6 months, relative to baseline (Time 0). Higher values denote greater depressive symptoms. The top panel presents results from analysis of the subset of the full sample who were prescribed an antidepressant; there was a significant group difference (i.e., those in Care Management showed greater reductions) in change in PHQ-9 score from baseline (Time 0) to 6 months (b=-1.52 (SE=0.40), t(813)=-3.75, p<.001). The bottom panel presents results from analysis of individuals with moderate-severe baseline symptoms (PHQ-9> 10) prescribed an antidepressant; there was a significant group difference in change in PHQ-9 score from baseline (Time 0) to 6 months (b=-2.48 (SE=0.72), t(302)=-3.44, p<0.001).
eFigure 3. Group Differences in Anxiety Symptoms Stratified by Medication Class and Baseline Symptom Severity

Note. Figure presents estimated mean values from intention-to-treat, mixed effects linear regression model of longitudinal change in anxiety symptoms (GAD-7 score) at 3 and 6 months, relative to baseline (Time 0). Higher values denote greater anxiety symptoms. The top panel presents results from analysis of the subset of the full sample who were prescribed an anxiolytic; there was a significant group difference (i.e., those in Care Management showed greater reductions) in change in GAD-7 score from baseline (Time 0) to 6 months (b=-1.41 (SE=0.41), t(552)=-3.41, p<0.001). The bottom panel presents results from analysis of individuals with moderate-severe baseline symptoms (GAD-7 > 10) prescribed an anxiolytic; there were no group differences in change over time.

CONSORT Checklist (Please refer to .pdf document).