ORIGINAL RESEARCH

Value-Based Benefit Design to Improve Medication Adherence for Employees with Anxiety or Depression

Kimberly J. Reid, MS; Kathleen M. Aguilar, MPH; Eric Thompson, MBA; Ross M. Miller, MD, MPH

BACKGROUND: Through reduced out-of-pocket costs and wellness offerings, value-based benefit design (VBBD) is a promising strategy to improve medication adherence and other health-related outcomes across populations. There is limited evidence, however, of the effectiveness of these policy-level changes among individuals with anxiety or depression.

OBJECTIVES: To assess the impact of a multifaceted VBBD policy that incorporates waived copayments, wellness offerings, and on-site services on medication adherence among plan members with anxiety or depression, and to explore how this intervention and its resulting improved adherence affects other health-related outcomes.

METHODS: A retrospective longitudinal pre/post design was utilized to measure outcomes before and after the VBBD policy change. Repeated measures statistical regression models with correlated error terms were utilized to evaluate outcomes among employees of a self-insured global health company and their spouses (N = 529) who had anxiety or depression after the VBBD policy change. A multivariable linear regression model was chosen as the best fit to evaluate a change in medication possession ratio (MPR) after comparing parameters for several distributions. The repeated measures multivariable regression models were adjusted for baseline MPR and potential confounders, including continuous age, sex, continuous modified Charlson Comorbidity Index, and the continuous number of prescriptions filled that year. The outcomes were assessed for the 1 year before the policy change (January 1, 2011, through December 31, 2011) and for 2 years after the change (January 1, 2012, through December 31, 2013). The primary outcome was a change in MPR. The secondary outcomes included healthcare utilization, medical or pharmacy costs, the initiation of medication, generic medication use, and employee absenteeism (the total number of sick days).

RESULTS: The implementation of the VBBD strategy was associated with a significant increase in average MPR (0.65 vs 0.61 in the pre-VBBD period; \(P = .004\)), the initiation of new medications for anxiety or depression (31.4% vs 29.5%, respectively; \(P = .033\)), and the filling of generic medications for anxiety or depression (85.1% vs 80.5%, respectively; \(P < .001\)). A multivariable adjusted analysis revealed a 0.05 increase in MPR after the benefit enhancement (\(P = .002\)). Healthcare utilization, costs, and absenteeism were not statistically different before and after the VBBD policy change.

CONCLUSION: The VBBD strategy was associated with improved medication adherence and cost-conscious medication use. Future analyses should explore whether these trends persist over time, and if they can further impact healthcare utilization, cost, and absenteeism.

KEY WORDS: depression, anxiety, medication adherence, medication possession ratio, value-based benefit design

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Improving medication adherence among individuals with anxiety or depression requires special considerations. Because of a variety of factors that are not definitively understood, low rates of medication adherence have been observed in individuals with anxiety or depression, especially among those diagnosed with depression. Adherence to antidepressant medications is particularly low, with approximately 50% of patients...
KEY POINTS

➤ Overall, value-based benefit design (VBBD) can improve medication adherence through waived copayments, wellness offerings, and on-site services.
➤ Whether VBBD can improve outcomes among patients with anxiety or depression is not known.
➤ This retrospective, 3-year pre/post VBBD study included 529 employees and their spouses with anxiety or depression to assess the impact of this approach on medication adherence.
➤ A multivariable linear regression model was used to investigate changes in medication possession ratio (MPR) after the implementation of a VBBD.
➤ The use of a VBBD approach resulted in a significant increase in MPR, and improved medication adherence, as well as the cost-conscious use of medications for anxiety or depression.
➤ This study suggests that employer-sponsored VBBD policies that reduce copayments is a meaningful tool to increase medication adherence for patients with anxiety or depression.
➤ Further analysis is needed to determine whether these trends persist over time, and if they impact healthcare utilization, cost, and absenteeism.

Medication adherence among patients with anxiety has been less frequently reported in the medical literature than among patients with depression. Inconsistent associations between medical treatment adherence and anxiety were observed in a meta-analysis of 13 studies that focused on anxiety. DiMatteo and colleagues suggest that this finding may be attributable to the complex nature of anxiety and anxiety-related research. In particular, anxiety and depression have been shown to be comorbid conditions in approximately 50% of patients. Moreover, medications typically classified as antidepressants (eg, selective serotonin reuptake inhibitors) are frequently used for the treatment of anxiety.

Poor medication adherence can have serious consequences for patients and their caregivers, as well as for the healthcare system. Patients with low adherence to antidepressant medications are less likely to respond to treatment. In addition, patients who are nonadherent to antidepressants are less likely to be adherent to other treatments for comorbid diseases. The failure to maintain medication adherence can result in increased utilization of healthcare resources, intensification of medical therapy, and higher healthcare costs.

Indirect medical costs, such as absenteeism, may also be reduced with higher rates of adherence.

As employers become more involved in efforts to improve healthcare quality and to control medical expenditures, there is an increasing focus on developing health benefit programs that provide cost-effective comprehensive insurance coverage and promote optimal outcomes. Value-based benefit design (VBBD) strategies use an evidence-based, data-driven approach to structure health insurance policies, and can encompass employer-sponsored wellness programs and incentives. Often, the goal of VBBD policies is to promote the appropriate use of healthcare services by lowering the access barriers to preventive care and by supporting healthy lifestyles.

One VBBD strategy to improve medication adherence involves reducing cost barriers by lowering copayments. This approach assumes that members are nonadherent primarily because they are unable or are unwilling to pay for certain medications, which is a theory partially supported by evidence. A literature review of 132 studies found that increased cost-sharing for medications is associated with lower rates of prescription initiation, poorer adherence to treatment, and more frequent discontinuation of therapy. Similarly, a large US employer was able to increase adherence to statins among its employee population by eliminating the copayments for these medications. There is limited evidence on how cost-sharing affects adherence to antidepressants, although similar trends have been reported in the literature.

Therefore, employer-sponsored VBBD policies that reduce copayments may be a meaningful tool to increase adherence, but the benefits have not been extensively explored or universally accepted. In particular, the impact of reducing copayments may vary by medication type and by population. For example, Chernew and colleagues found that lowering copayments improved adherence to angiotensin-converting enzyme inhibitors or angiotensin receptor blockers, beta-blockers, antidiabetes drugs, and statins, but not in patients receiving inhaled corticosteroids.

Choudhary and colleagues found that across a post–myocardial infarction population, lowering copayments for drugs such as beta-blockers increased adherence, but clinical outcomes (eg, major vascular events) were only improved among minority (nonwhite) patients. Such findings suggest an interplay among multiple factors, including cost-sharing, which can influence medication adherence and health outcomes.

Several variables have been associated with poor adherence to antidepressant medications, and some of these factors are shared with other medication types, such as perceived treatment efficacy or adverse events. Other barriers, however, may be more common among
patients with anxiety or depression. For example, patients may feel stigmatized for taking a so-called behavioral health medication, or they may not perceive their condition to be as threatening as other physiologic illnesses. Further confounding adherence to medications for anxiety or depression is that a diagnosis of depression is in itself a risk factor for poor adherence.

Given the complexity of medication adherence among patients with anxiety or depression, it could be expected that the most effective interventions would be those that target multiple barriers to adherence. Two recent systematic reviews investigated approaches to improving adherence to antidepressant medications and confirmed that multifaceted strategies were most likely to be successful. Although there is substantial heterogeneity in the components of these interventions, few studies have investigated the effect of reducing out-of-pocket costs specifically to improve adherence to antidepressants.

Recognizing the potential benefits of improving adherence to medications for anxiety and depression for its employees and their families, Cerner Corporation developed a VBBD strategy to waive copayments for prescriptions that are associated with the treatment of anxiety and/or depression, while providing specialized on-site healthcare services and wellness offerings for its member population. The primary objective of this analysis was to assess the impact of a multifaceted VBBD strategy on medication adherence in this population. The secondary objective was to explore how this intervention, and the resulting possible improved medication adherence, affected other health-related outcomes.

**Methods**

**Study Setting and Design**

We used a retrospective longitudinal pre/post design to measure the impact of a VBBD policy change on medication adherence, prescription fills, healthcare utilization, cost, and absenteeism. Employees were followed longitudinally, and data before the policy change were compared with the same employee’s data after the policy change. The study design did not allow for a control group, because all members were eligible for the VBBD coverage for anxiety and depression, and a suitable comparison population was not available. Moreover, the unique characteristics of these behavioral health conditions preempted comparisons with other conditions.

On January 1, 2012 (index date), the benefit enhancement was enacted for employees and their dependents of Cerner Corporation, a global healthcare company with technology and service offerings that contribute to the systemic improvement of healthcare delivery and the health of communities. As part of this mission, Cerner is committed to supporting the health and wellness of its employees and their families through a variety of benefit offerings. These benefits include integrated wellness programs and on-site health centers that are available to employees and their families in the Kansas City, MO, area. In addition, more than 20,000 employees and their dependents are covered by Cerner’s self-insured health policy.

The VBBD strategy incorporated 3 elements, including (1) waived copayments for medications for the treatment of anxiety and depression, (2) mental health counseling services offered at an on-site health center, and (3) the promotion of an existing condition management program for depression. Copayments were waived for generic and branded medications, regardless of whether they were filled at the on-site pharmacy or in the community. Before and after the VBBD policy change was instituted, health plan members had access to other wellness offerings, including management programs for certain conditions. Members in the Kansas City, MO, area could also use the on-site health center for clinic visits and pharmacy services.

In fall 2011, members were notified that copayments for anxiety and depression medications would be waived and that new therapy services would be offered on-site starting in January 2012. Through this notification and during visits to the on-site health center, members were encouraged to participate in the depression condition management program. During the study period, no other substantial benefit policy changes were instituted.

To evaluate the impact of the benefit enhancement, the primary and secondary outcomes were compared among a member cohort that was followed over time before and after the policy change, which occurred on January 1, 2012. The study cohort included health plan members, employees, and their spouses with anxiety or depression who were selected by prescription or by diagnosis between January 1, 2011, and December 31, 2011. Those same members were then followed for 2 years postintervention (ie, January 1, 2012, through December 31, 2013).

The Western Institutional Review Board determined that the protocol for this study qualified for an exception, because the analysis was performed on a secondary data set consisting of medical and prescription claims data that had been deidentified by the removal of all personal health information. The Western Institutional Review Board is registered with the Office for Human Research Protections and the US Food and Drug Administration (FDA), has been fully accredited by the Association for the Accreditation of Human Research Protection Programs, and has electronic signatures’ compliance with 21 CFR §11.

**Study Sample**

Health plan members were selected for inclusion in
the study by filling a prescription for an anxiety or depression medication or by having a diagnosis code for anxiety or depression during the study period. (The International Classification of Diseases, Ninth Revision diagnostic codes for depression or anxiety that were used included 296.2, 296.3, 300.4, 309.10, 293.84, 300.0, 300.02, 300.09, 309.21, 309.24, and 309.28.) To be included in the study, members had to have a diagnosis or a medication fill in the pre-VBBD and post-VBBD periods. Depression and anxiety medications were defined using the current FDA-approved National Drug Codes indicated for depression and/or anxiety. Given the high prevalence of comorbid anxiety and depression in the general US population, and that many of these medications are used to treat anxiety and depression (eg, selective serotonin reuptake inhibitors), it was not possible to stratify the sample into depression and anxiety subgroups.

Patients aged <18 years or >65 years and those without data in every year of the 3-year study period were excluded from the analysis. From a starting population of 16,614 health plan members, 12,394 members were excluded, because they were not flagged as having anxiety or depression by the diagnostic codes and the prescription criteria listed above; 51 members were not aged between 19 and 64 years; another 1264 members did not meet the pre-VBBD and post-VBBD requirements; and 2376 members lacked continuous eligibility throughout the study period, leaving a total study population of 529 patients. The pre-VBBD and post-VBBD periods were used to determine the initiation of new medications for anxiety or depression and for comorbidities.

**Outcome Measures**

The primary study outcome was medication possession ratio (MPR), which was defined as the total days of a prescription supply during a fixed period of 365 days. For the post-VBBD follow-up, which was a 2-year period, the MPR was calculated for each year separately and was then averaged. Less than 0.5% of the included members filled more than 1 anxiety or depression medication on the same day; however, in these instances, only the prescription with the highest days supplied was included in the analysis. Otherwise, early prescription refills were counted toward the total MPR, and, consequently, the total days supplied could exceed 365 days, resulting in MPR values of >1.0. To account for this, MPR values of >1.0 and <1.5 were found and were censored to be 1.0, which affected 8% of the study cohort. Early refills may result from a variety of reasons, including dosing adjustments, changes in medication, stocking up for travel or vacations, the sharing of drugs with friends and family, and lost pills. Values of >1.5 were observed for 3% of the study cohort, and, because they may indicate atypical circumstances, were excluded from the analysis.

The secondary outcomes included changes in healthcare utilization and costs, prescriptions, and absenteeism before and after the VBBD policy change. The healthcare utilization metrics included the number of visits for inpatient, outpatient, emergency department, urgent care, and physician office services. The total healthcare spending, medical-only spending, and the prescription costs were also determined. The prescription trends assessed included the percentage of medications for anxiety or depression that were filled and were generic, new, or were obtained through Cerner’s on-site pharmacy. A new medication was defined as a prescription fill for an anxiety or depression drug that was not filled during the preindex period. Cerner’s administrative records of sick leave were used to determine the absenteeism rates.

**Data Analysis**

The descriptive statistics used were unadjusted, with continuous variables represented as means and standard deviation, whereas categorical variables were expressed as actual counts and percentages. Data were viewed graphically using a box plot to see the upward shift in MPR distribution after the implementation of the VBBD program (Figure 1).

The unadjusted effect of the VBBD program on non-primary outcomes was estimated using repeated measures linear regression models for continuous outcomes and re-
peated measures logistic regression models for binary outcomes. The unadjusted regression models included a fixed effect for the VBBD intervention, without covariates, and utilized repeated measures within members to account for multiple measurements that were correlated over time.

A multivariable linear regression model was chosen as the best model to measure change in MPR after comparing model fit statistics and residual plots for several distributions. The repeated measures multivariable regression adjusted for baseline MPR and potential confounders, including continuous age, sex, continuous modified Charlson Comorbidity Index (CCI) score, and the continuous number of prescriptions filled that year.27

The model covariates were chosen based on their correlations with MPR and also for potential predictive abilities that could explain any variations in MPR. Specifically, medication adherence can vary with age and sex, so these were included in the model. In addition, changes in medication adherence are dependent on baseline adherence levels, so baseline MPR was also included as a covariate.

The CCI score and the number of prescriptions filled were included to account for prescription burden resulting from concomitant medical conditions. Interactions of covariates were tested, but none were found, and therefore were not included in the MPR model. The analyses were performed using SAS version 9.3 (SAS Institute; Cary, NC), and the significance level was defined as a 2-sided $P$ value of <.05.

Results

A total of 529 members were eligible for inclusion in the analysis. The baseline characteristics of the depression and/or anxiety cohort are presented in Table 1 (anxiety parameters not shown). Over the course of the 3-year study period, no significant increases were found in the incidence of diabetes, heart disease, or stroke in the study population. Similarly, there was no change in the average modified CCI score. Participation in the depression condition management program, however, did increase significantly ($P <.05$) from baseline to end-of-study follow-up.

Based on the results of the unadjusted analysis, the VBBD policy change was associated with favorable medication use trends. In particular, the average MPR was significantly higher in the post-VBBD period than in the pre-VBBD period (0.65 vs 0.61, respectively; $P = .004$).

Before and after the VBBD policy change, patients were equally likely to fill prescriptions at the on-site pharmacy (60.7% vs 65.4%, respectively; $P = .399$), and patients in the post-VBBD period were more likely to use generic medications than patients in the pre-VBBD period (80.5% vs 85.1%, respectively; $P <.001$; Figure 2). In addition, members were also significantly more likely to start a new medication for anxiety or depression during the post-VBBD period than in the pre-VBBD period (31.4% vs 29.5%, respectively; $P = .033$).

After adjusting for baseline MPR, age, sex, age by sex interaction, CCI score, and number of prescriptions a member filled that year, there was a 0.05 (95% confidence interval [CI], 0.02-0.07; $P = .002$) increase in MPR during the post-VBBD period (Figure 3). The multivariable model showed no association between MPR and age and sex, but did indicate a significant association with the CCI score and the number of prescriptions filled.

Table 1 Baseline Characteristics of the Study Cohort

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Members (N = 529)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, mean, yrs (SD)</td>
<td>41 (±10)</td>
</tr>
<tr>
<td>Sex, N (%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>201 (38)</td>
</tr>
<tr>
<td>Female</td>
<td>328 (62)</td>
</tr>
<tr>
<td>Relationship status, N (%)</td>
<td></td>
</tr>
<tr>
<td>Subscriber</td>
<td>391 (74)</td>
</tr>
<tr>
<td>Spouse</td>
<td>128 (26)</td>
</tr>
<tr>
<td>Comorbid conditions, N (%)</td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>22 (4)</td>
</tr>
<tr>
<td>Heart disease</td>
<td>69 (13)</td>
</tr>
<tr>
<td>Stroke</td>
<td>3 (0.6)</td>
</tr>
<tr>
<td>Modified CCI, mean (SD)</td>
<td>0.2 (±0.6)</td>
</tr>
<tr>
<td>Depression condition management program participation, N (%)</td>
<td>20 (4)</td>
</tr>
</tbody>
</table>

CCI indicates Charlson Comorbidity Index; SD, standard deviation.

Figure 2 Utilization Before and After the VBBD Policy Change

VBBD indicates value-based benefit design.
tional prescriptions filled increased adherence by 0.05 (95% CI, 0.04-0.06). This finding was unexpected, because we were aware of the association between polypharmacy and medication adherence. Although it was not statistically significant, it could have been a spillover effect from the increased use of the on-site clinic and condition management program participation. (In this study we did not look at medication adherence among medications used for other conditions, which would be an interesting association to consider for the next phases of this project.)

Although there was a significant reduction in participants’ prescription spending after the VBBD policy change (P = .001), there were no other meaningful changes in healthcare costs over the study period (Table 2).

Although there was a slight increase in the pharmacy spending and the total healthcare spending for the health plan, this was mitigated by a minor decrease in the medical spending. Had the VBBD policy not been in place, the participants would have spent an average of $324 (± 875) on anxiety or depression medication copays (ie, the avoided costs; Figure 4). This amount results from approximately 10% of the study sample having costs of more than $1100, as a result of several expensive and branded drug regimens.

Other health-related outcomes were similar between the pre-VBBD and post-VBBD periods. The number of all prescriptions filled, not only those for anxiety or depression, remained relatively consistent over time (23.5 ± 20.8 pre-VBBD vs 23.1 ± 20.8 post-VBBD). Likewise, no significant changes were observed in the healthcare utilization trends (P >.05 for all).

Finally, there was no significant association between the VBBD strategy and the absenteeism rates in the 2 years after the policy change (18.8 ± 22.0 hours post-VBBD and 18.4 ± 22.0 hours pre-VBBD; P = .742).

Discussion

To the best of our knowledge, this is the first study to examine the effects of a multifaceted VBBD policy change on medication adherence and on other health-related outcomes among a population with anxiety or depression. Recognizing the need and challenge of improving adherence to medications for anxiety or depression, this VBBD strategy took a 3-pronged approach that incorporated employer-sponsored wellness offerings, on-site services, and waived copayments. It was believed that providing this integrated support to members with anxiety or depression would have the highest likelihood of improving health outcomes and members’ quality of life while reducing healthcare expenditures.

Previous studies have reported positive outcomes associated with employer-sponsored VBBD strategies, including copayment waivers and wellness programs, although limited research on the topic has been conducted among populations with anxiety or depression. For other conditions, such as hyperlipidemia, diabetes, and hypertension, reducing members’ out-of-pocket expenses and/or offering wellness services has improved medication adherence and other health-related outcomes. Fewer studies have reported on employer-sponsored anxiety or depression interventions, and, in the course of

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Table 2  Annual Health Plan Spending Variation per Member of the Study Cohort

<table>
<thead>
<tr>
<th>Type of spending, $</th>
<th>Pre-VBBD period</th>
<th>Post-VBBD period</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total healthcare, mean (SD)</td>
<td>5852 (±7839)</td>
<td>5844 (±8126)</td>
<td>.895</td>
</tr>
<tr>
<td>Medical, mean (SD)</td>
<td>4869 (±6183)</td>
<td>3996 (±6464)</td>
<td>.820</td>
</tr>
<tr>
<td>Pharmacy, mean (SD)</td>
<td>1782 (±4104)</td>
<td>1848 (±4169)</td>
<td>.774</td>
</tr>
<tr>
<td>Depression or anxiety prescription, mean (SD)</td>
<td>343 (±873)</td>
<td>324 (±875)</td>
<td>.168</td>
</tr>
</tbody>
</table>

SD indicates standard deviation; VBBD, value-based benefit design.
this review, no studies were identified that target adherence to medications for these conditions. It is possible that this lack of coverage is a result of the challenges associated with implementing effective benefit policies that are focused on anxiety or depression.

Population-level management of conditions such as anxiety and depression can differ between nonbehavioral health conditions in several key ways. First, the identification of members who would benefit from treatment requires screening methods that are more complex and are more error prone than some laboratory measurements that simply flag out-of-range values. In addition, members may be reluctant to pursue treatment because of stigma regarding their condition or because of a lack of understanding associated with behavioral health conditions. Finally, patients with anxiety or depression may choose to discontinue their treatment early if they do not perceive the benefits of their medication, which can take up to 6 weeks to manifest, and are experiencing only the drug’s side effects.

The results of our study suggest that this integrated and multifaceted VBBD strategy was an effective intervention for members with anxiety or depression. In addition to waived copayments, the condition management programs and the integration of pharmacy services within a medical home could have reduced barriers to medication adherence, including side-effect management. After adjusting for potential confounding factors, there was a 0.05 increase in MPR after the benefit enhancement (P = .002). Over time, there is a tendency for individuals with chronic conditions to discontinue treatment. The participants in our study cohort were followed for 3 years, so it is meaningful that they not only persisted with their treatment but actually increased their medication use.

Although the MPR increase that was observed in our study was not drastic, Fortney and colleagues found that similar improvements in MPRs among patients with depression were associated with positive health outcomes. The researchers compared adherence to antidepressants across clinics that did and did not institute a care management strategy. In addition to adherence, including side-effect management. After adjusting for potential confounding factors, there was a 0.05 increase in MPR after the benefit enhancement (P = .002). Over time, there is a tendency for individuals with chronic conditions to discontinue treatment. The participants in our study cohort were followed for 3 years, so it is meaningful that they not only persisted with their treatment but actually increased their medication use.

The results of our study also suggest that the VBBD strategy was associated with cost-conscious medication use. Specifically, after the benefit enhancement, there was an increase in the use of generic drugs and prescriptions filled at the on-site pharmacy, which has a lower cost to the employer. Because copayments were waived for generic and branded medications, as well as for those filled at on-site or community pharmacies, these findings may be attributed to other features of the benefit plan.

The members might have been encouraged to select generic medications or to fill prescriptions at the on-site pharmacy through the condition management coaching or wellness services, although these were not defined as objectives of the VBBD strategy. Community pharmacies were not required to dispense medications as written, and could substitute the lowest-cost generic prescription.

Although no meaningful differences in healthcare utilization, costs, or absenteeism were observed in this analysis, over time, improved medication adherence and cost-conscious use may result in better health outcomes and in the decreased utilization of expensive healthcare services. The follow-up duration for this study was only 2 years, and the effect of increased adherence may take longer to fully materialize, given the nature of chronic conditions. As preliminary evidence of the benefit, however, there were slight nonsignificant decreases in the total healthcare costs, despite a population that was 3 years older by the end of the study and the coverage of additional anxiety and depression medication costs resulting from improved adherence and cost-shifting.

Limitations
Given the observational study design, certain confounding factors may have influenced the results, which could not be fully accounted for in the multivariate model. For example, participating members had access to a number of other wellness services provided by the employer before and after the VBBD policy change, and it is unclear how these offerings might have affected the member cohort over time. Similarly, the study was conducted at a single organization among employees and their spouses; it is possible that there are unique charac-
teristics of this cohort that hinder the ability to generalize the results to other populations, such as those eligible for Medicaid or Medicare coverage. Finally, it was not possible to differentiate the members’ actual out-of-pocket costs from the total healthcare spending, which included insurance payments.

The results of this analysis considered medication adherence among members with anxiety or depression. The members were included in the analysis if they had a diagnosis of anxiety or depression or if they had a prescription for a drug for either condition. It was not possible to stratify these conditions, because (1) many of these medications are used to treat depression and anxiety, (2) information on diagnosis in claims data is frequently incomplete, and (3) anxiety and depression are often comorbid conditions. As conditions with unique manifestations, grouping these 2 conditions together might have influenced the results. For example, although depression has been associated with significantly decreased treatment adherence, the association of anxiety with treatment adherence is inconclusive. Thus, the results of our analysis might have been stronger if members with anxiety were excluded from this analysis.

Other factors could have diminished the true effect size of the VBBD policy change. In particular, members were only followed for 2 years after the policy change, and it is possible that the benefits of improved medication adherence, such as decreased healthcare costs, take longer to manifest. The VBBD strategy targeted members with depression and anxiety, which are associated with poor medication adherence and resistance to treatment interventions. Benefit enhancements aimed at other chronic conditions might have had a greater impact on the health outcomes.

Conclusion

Despite the potential limitations, the results of this analysis suggest that employers have an opportunity to improve health outcomes for employees with anxiety or depression through an integrated and cost-effective VBBD strategy. Similar policies may substantially ameliorate the burden that these conditions place on individuals and their families, as well as on employers and payers. Future research should explore the impact of anxiety and depression VBBD policy changes on health-care utilization and costs over a longer time horizon, which VBBD features are associated with the greatest benefit, as well as patient-reported outcomes and quality-of-life measurements.

Author Disclosure Statement

Ms Reid, Ms Aguilar, and Dr Miller are employees of Cerner Corporation and own stock in Cerner Corporation.

References

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A well-known saying from the economist John Maynard Keynes is “in the long run, we are all dead.” The full quote, however, clarifies what Keynes had in mind: “The long run is a misleading guide to current affairs. In the long run we are all dead. Economists set themselves too easy, too useless a task if in tempestuous seasons they can only tell us that when the storm is past the ocean is flat again.” Keynes was making the point that his contemporaries, who were fixated on the present and felt that the economy would always return to a set equilibrium point with no government interference, were wrong. The point here is that short-run results do not always lend themselves to a complete assessment of the situation at hand. And this is a key finding in the article by Reid and colleagues.

It has long been known and is documented in the literature, as Reid and colleagues point out, that value-based benefit design (VBBD) can impact the utilization of medications, and, ultimately, of medical spending. But, a key differentiator of this particular study is that, as Reid and colleagues point out, that value-based insurance design. The long run is the time period in which anything can be changed, or in which individual and firms are fully able to respond to economic incentives and take advantage of economic opportunities. The long run has no specific time frame; it is simply the time period that is long enough to allow full response to changing incentives.

This is the point of looking at the short run versus the long run. “The short run is the time period in which one or more important conditions cannot be changed….The long run is the time period in which anything can be changed, or in which individual and firms are fully able to respond to economic incentives and take advantage of economic opportunities. The long run has no specific time frame; it is simply the time period that is long enough to allow full response to changing incentives.”

If we can all look beyond the short run and make an investment in VBBD, our entire healthcare system wins. If we cannot, then it will not really matter, because “in the long run, we are all dead.”