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Research Paper

Early interventions to prevent disability for workers with mental health conditions: Impacts from the DMIE

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Abstract

Background: As of 2011, over 9 million working-age adults were receiving federal disability benefits and this number is expected to rise steadily. Early intervention programs that seek to maintain employment and forestall the receipt of federal disability benefits offer a promising strategy to reduce the growing number of working-age adults on the disability rolls.

Objectives: Using random assignment, this study examined whether an early intervention program of personal navigators, enhanced medical care, and employment supports can reduce dependence on federal disability benefits for adult workers with mental health conditions.

Methods: The study reports multivariate and descriptive findings based on 2279 participants in the Demonstration to Maintain Independence and Employment (DMIE). Logistic regression analysis was used to estimate program impacts in the treatment group relative to the control group. Data were integrated from state participant surveys and the SSA Ticket Research File.

Results: The DMIE intervention significantly reduced the percent of participants who received disability benefits after 12 months of enrollment. Across both states, the difference between the treatment group and control group was 1.1 percentage points (2.5% versus 3.6%, $p < 0.01$). In Texas, the difference was 1.2 percentage points (3.2% versus 4.4%, $p < 0.01$).

Conclusions: Early intervention programs with a personal navigator can reduce dependence on federal disability benefits for adult workers with mental health conditions. Future studies on the cost-effectiveness of such programs are needed.

Keywords: Disability; Employment; Mental health; Early intervention; Random assignment

Legislators and policymakers have expressed strong interest in early intervention programs to reduce dependence on federal disability benefits. Between 2000 and 2010, the number of disability benefit applications among working-age adults increased from 1.4 million to 2.8 million. As of 2011, over 9 million working-age adults were receiving federal disability benefits and this number is expected to grow steadily.[1] The continuing rise in the number of individuals enrolled in the Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI) programs and growing expenditures paid out to beneficiaries has prompted the need to identify strategies that limit the growth of future outlays. Whereas SSDI is a social insurance program for adults with a prior work history, SSI is a means-tested program that provides cash benefits to those deemed medically eligible regardless of prior work history.[2]

One strategy to reduce dependence on disability benefits includes return-to-work initiatives for beneficiaries who currently receive disability benefit payments. However, only a small fraction (less than 1%) of SSDI beneficiaries leaves the disability rolls in a given year.[3] This finding is not surprising because SSDI beneficiaries have carefully documented their inability to work due to a medical condition. Encouraging a person to return to work after demonstrating a limited capacity for work is counterintuitive. Also, SSA beneficiaries may be reluctant to return to work due to fear of losing Medicare coverage, which SSDI beneficiaries are eligible to receive after a 24-month waiting period. As a result, early intervention programs that try to keep people working and forestall the need for SSA benefits offer a promising alternative strategy to reduce the number of disability beneficiaries.[4]

As part of a broad federal effort to promote employment for adults with disabilities, Congress established and authorized the Demonstration to Maintain Independence and

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Employment (DMIE) under the Ticket to Work and Work Incentives Improvement Act (''Ticket Act'') of 1999.[5] The DMIE was implemented in four states: Kansas, Minnesota, Texas, and Hawaii. The demonstration sought to test whether a program of enhanced medical services and employment supports for working adults with potentially disabling conditions could prevent or forestall employment loss and subsequent enrollment into federal disability benefit programs. The DMIE was not an insurance program by itself, but represented a set of wrap around services that supplemented a person's existing set of covered services under public or private insurance. All DMIE participants had some form of existing health care coverage prior to joining the study.

To be eligible for the DMIE, working adults with potentially disabling conditions were required to be between 18 and 64 years old, working at least part-time (40 hours or more per month), and not receiving or applying for federal disability benefits. Therefore, the DMIE represents an early intervention program for adults *before* they apply for SSA disability benefits, which requires proving one's inability to work due to a health condition that is expected to last at least 12 months or result in death.[6] The DMIE program was intended to reduce dependence on federal disability benefits by providing timely access to the specific mix of services that participants need to maintain employment.

This study focuses on DMIE program impacts in Minnesota and Texas, the two states which enrolled the largest number of participants (each state had more than 1000 participants). A detailed description of the early interventions in Minnesota and Texas may be found elsewhere.[7,8] Minnesota began to enroll DMIE participants in January 2007 and targeted working adults with mental health conditions who resided in the Minneapolis − St. Paul area and the northeastern region of the state. In Texas, the state began enrolling DMIE participants in April 2007 and focused on workers with serious mental illness (bipolar disorder, schizophrenia, or major depression) or a combination of chronic physical conditions and behavioral health conditions that placed them at greater risk of disability. Workers with a chronic physical condition in the absence of a behavioral health condition were ineligible. All Texas DMIE participants resided in the Houston area and received public health insurance coverage through the Harris County Hospital District (HCHD), a large safety-net provider.

The goal of the national DMIE evaluation was to determine if workers who were offered an early intervention of enhanced health and employment services were less likely than a group of individuals with similar baseline characteristics to enroll in federal disability programs. A prior study reported initial findings of the DMIE program's effects on employment and SSA applications after 12 months.[9] Because of the time frame of the study combined with lags in data availability, the authors were unable to comment on the effectiveness of the program in preventing or forestalling federal disability benefit receipt. The receipt of benefits is important because not all individuals who apply for disability benefits are granted them and because Congress was specifically interested in the program's effect on the actual receipt of such benefits.

This study extends initial findings on the DMIE by examining the impact of the program on the *receipt* of federal disability benefits. These findings have direct implications for the design of early interventions and, more generally, for assessing the extent to which the DMIE program achieved its objectives. The present study focuses on Minnesota and Texas because of the overlap in their target populations, both of which included adults with mental health conditions. The other two states with DMIE programs, Kansas and Hawaii, recruited participants with a wide array of health conditions and diabetes, respectively.

Methods

Data sources

Each of the DMIE states collected survey data on their participants and developed a uniform data set (UDS). The UDS provided a standard set of variables that were commonly defined across DMIE states, including information on the demographic characteristics (age, gender, race, education, marital status), health status (SF-12 mental and physical health scores, activities of daily living, and instrumental activities of daily living), and the employment characteristics (industry, job type) of treatment and control group participants. The UDS also included DMIE enrollment dates and group assignment codes.

SSA administrative data were used to identify SSDI and SSI benefits received by DMIE participants. Under a data-sharing agreement between CMS and SSA, we obtained information on SSDI and SSI disability payments from the SSA Ticket Research File (TRF). The TRF is an annually updated file that contains longitudinal data from January 1994 through December 2009 on SSDI and SSI participation on all individuals 18–64 years of age who received benefits during this time frame. We integrated these data sources after conducting validation checks and a review of data quality. At the end of this process, the four-state sample included a total of 4054 participants representing about 99% of the 4099 participants across the DMIE states, including Minnesota and Texas.

Description of early intervention

The early intervention had several elements that were similar across DMIE states. First, DMIE-funded enhanced health benefits went beyond existing medical coverage and in some states included dental and vision care, expedited mental health visits, and home visits for assistance with activities of daily living. These wrap around health services effectively supplemented existing public insurance

benefits. Second, reduced monthly premiums, co-payments, and deductibles for health care services were also included as DMIE benefits to encourage access to services. Third, each state offered employment supports, including employment counseling and development of an individualized employment plan. Fourth, each of the DMIE programs offered personal navigators who met one-on-one with participants to identify needs, establish goals, and facilitate access to both health and employment services. In summary, each state provided enhanced health services, employment supports, and service coordination assistance through person-centered case management.

Recruitment and random assignment

In Texas, study candidates were identified using administrative data files to flag specific conditions. Recruitment was conducted by mail and through in-person encounters by HCHD members waiting to obtain health care services at safety-net clinics. The same eligibility screening criteria were applied to both recruitment cohorts. Participants were then randomly assigned to either the treatment or control group.

In Minnesota, study candidates were identified by using the state's MMIS claims database to flag specific conditions. A stratified random sampling strategy was used to identify participants and assign them to either the treatment or control group based on four variables: age, functional status, geographic location, and income. The state followed a 3:1 assignment ratio to develop their program intervention, which accounts for Minnesota's higher proportion of treatment group members in the study sample.

Statistical analyses

Random assignment is the strongest evaluation design possible and produces unbiased estimates of program impacts when randomization yields treatment and control groups with similar characteristics. To account for differences that may occur by chance, we conducted our analysis using multivariate regression models. This allows us to examine the statistical association between the intervention and key outcome measures while controlling for baseline participant characteristics, such as age at enrollment, mental health and physical health scores, disability application history prior to enrollment, year of enrollment, and withdrawals from the program before September 2009, the official end date for the demonstration. We used logistic regression models in our analyses to estimate the likelihood of federal disability benefit receipt within 12 months.

The analyses are based on an intent-to-treat approach, which includes all available data for participants in the treatment group, regardless of the extent to which they used DMIE services. This approach produces conservative estimates of the impact of a specific intervention, but captures the likely effects that an early intervention might have. In practice, all participants may not necessarily use the enhanced services. We examined information for Minnesota and Texas separately and analyzed a pooled sample of the two states, participants from which had overlapping characteristics. For example, both states included persons with severe mental illness, had less than a third of participants working full-time, and had low-income populations (average earnings in 2008 were below $20,000).

Our final analytic sample included 926 participants from Minnesota and 1353 participants from Texas. To account for a change in procedures for random assignment, 630 participants who had enrolled in Minnesota's DMIE program after May 1, 2008 were excluded from our sample. Participants in both Minnesota and Texas were also excluded if they were receiving SSDI or SSI benefits at the time of DMIE enrollment (44 and 62 participants, respectively).

Study variables

Our primary outcome variable was a binary indicator of disability benefits received within 12 months of DMIE enrollment. In Texas, 17 of 757 participants in the DMIE treatment group and 26 of 596 control group members received disability benefits. However, in Minnesota, the number of people with disability benefits was lower with 8 of 715 DMIE treatment group participants and 3 of 211 control group members, respectively. Sample sizes for each group are provided in Table 1. Four measures of health were used as control variables in the regression analyses. Two of these measures, mental SF-12 scores and physical SF-12 scores, provide information on overall health status.[10] SF-12 scores are norm-based, with a score of 50 representing the national average with each increment of 10 points representing a standard deviation. Lower SF-12 scores indicate worse functioning or health status.

We used two other measures, Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs) to assess functional status.[11] Both measures are binary variables, with a value of one indicating that the respondent has difficulty with one or more ADLs or IADLs. ADLs include difficulty with the following basic activities: (1) bathing or showering, (2) dressing, (3) eating, (4) getting in and out of bed or chairs, (5) walking, (6) getting outside, and (7) using the toilet. IADLs include difficulty with the following household activities: (1) preparing meals, (2) shopping for groceries or personal items, (3) managing finances, (4) using the telephone, (5) doing heavy housework, (6) doing light housework, (7) getting to places outside of walking distance, and (8) managing medications.

Employment measures included average hours worked in the past 28 days and variables representing the type of industry and occupation. The mutually exclusive industry categories are defined as follows: (1) education/health care, (2) trade, transportation and utilities, (3) leisure/hospitality, and (4) all other industries. Job type categories included the

Table 1
Baseline participant characteristics

	Full sample	Treatment group	Control group	*p* value
Minnesota				
Age (mean years)	37.9	38.0	37.8	0.898
% Male	37.7	37.9	37.0	0.805
% Currently married	23.7	22.7	27.0	0.206
% White and Non-Hispanic	82.9	83.6	80.6	0.317
% High school education and beyond	68.4	68.4	68.2	0.968
Mental SF-12 score	34.9	35.0	34.6	0.649
Physical SF-12 score	48.2	48.0	49.1	0.154
Total ADLs	1.0	1.0	1.1	0.291
Total IADLs	1.4	1.4	1.5	0.469
Average monthly hours worked	122.3	122.0	123.5	0.665
% Industry: education/health care	20.6	20.4	21.3	0.777
% Industry: trade, transportation, and utilities	21.0	22.0	17.5	0.147
% Industry: leisure and hospitality	20.1	19.3	22.7	0.289
% Job type: professional/technical	19.7	17.5	27.0	0.005
% Job type: clerical/sales	31.0	31.5	29.4	0.562
% Job type: service occupations	34.0	35.2	29.9	0.138
% Any prior SSDI or SSI applications	14.1	14.3	13.7	0.848
Sample size	$n = 926$	$n = 715$	$n = 211$	
Texas				
Age (mean years)	47.0	46.8	47.2	0.362
% Male	23.9	22.7	25.5	0.236
% Currently married	24.9	24.7	25.2	0.845
% White and Non-Hispanic	24.0	23.1	25.2	0.383
% High school education and beyond	39.5	40.4	38.3	0.418
Mental SF-12 score	50.0	50.1	50.0	0.881
Physical SF-12 score	38.1	38.2	37.9	0.499
Total ADLs	0.8	0.8	0.9	0.266
Total IADLs	1.1	1.0	1.2	0.203
Average monthly hours worked	122.0	122.5	121.3	0.694
% Industry: education/health care	28.6	30.1	26.7	0.163
% Industry: trade, transportation, and utilities	10.3	10.0	10.6	0.750
% Industry: leisure and hospitality	11.0	11.0	11.1	0.949
% Job type: professional/technical	16.5	17.7	14.9	0.170
% Job type: clerical/sales	22.0	21.9	22.1	0.923
% Job type: service occupations	39.5	39.2	39.8	0.843
% Any prior SSDI or SSI applications	14.4	14.8	13.9	0.651
Sample size	$n = 1353$	$n = 757$	$n = 596$	

Source: UDS variables submitted by Minnesota and Texas. SSDI and SSI benefit receipt data from SSA Ticket Research File [TRF].

following: (1) professional/technical, (2) clerical/sales, (3) service occupations, and (4) all other job types.

Baseline participant characteristics

Overall, random assignment worked well in each state to produce a similar distribution of baseline characteristics for the treatment and control groups (Table 1). A slightly lower fraction of Minnesota participants had a professional or technical occupation in the treatment group due to chance, but no other differences were evident. Demographic characteristics varied across the Minnesota and Texas DMIE programs, with a few exceptions. On average, participants in Minnesota were younger at the time of enrollment than in Texas (38 versus 47 years). A greater share of participants in Minnesota was male compared with Texas (38% versus 24%). Only a quarter of participants were currently married in both states, so most participants did not have the option of alternative health insurance through a spouse. However, a stark difference is evident in the race and ethnicity of participants. Specifically, non-Hispanic whites represent a much higher proportion in Minnesota than in Texas (83% versus 24%), which reflects a high prevalence of Hispanics residing in the Houston area. In Minnesota, two-thirds of participants had attained at least a high school education; the rate in Texas was 40%.

The health and functional status of participants at baseline revealed differences by state. The average mental SF-12 score in Texas was equal to the national average of 50. In Minnesota, the mean SF-12 mental health score across participants was 35, well below the national average. This finding shows that Minnesota participants had worse than average mental health status, which is expected given the state's focus on persons with severe mental illness. In contrast, Texas had a relatively low SF-12 physical health score of 38, while Minnesota had

Table 2
Logistic regression analysis of disability benefits received within one year of the DMIE for combined sample (N = 2279, pseudo R-squared = 0.2131)

	Odds ratio	Z statistic	p value
DMIE intervention group	0.558	−1.98	0.047
Age (mean years)	1.021	1.21	0.227
Male	1.691	1.40	0.161
Currently married	0.276	−2.40	0.016
White and Non-Hispanic	0.833	−0.55	0.581
High school education and beyond	0.643	−1.40	0.161
Mental SF-12 score	0.997	−0.21	0.835
Physical SF-12 score	0.939	−3.46	0.001
Total ADLs	0.812	−1.66	0.096
Total IADLs	1.193	1.68	0.093
Average monthly hours worked	0.988	−4.32	<0.001
Education/health care industry	0.823	−0.54	0.590
Trade/transportation/utilities industry	0.435	−1.47	0.142
Leisure/hospitality industry	0.782	−0.50	0.616
Professional/technical occupation	1.212	0.34	0.736
Clerical/sales occupation	1.364	0.59	0.555
Service occupation	1.733	1.17	0.243
Any prior SSA applications	2.684	3.12	0.002

Source: UDS variables submitted by Minnesota and Texas. SSDI and SSI benefit receipt data from SSA Ticket Research File [TRF].

a near average score of 48. Low physical health scores in Texas may reflect the inclusion of persons with behavioral health diagnoses occurring with a serious physical impairment. However, both states enrolled populations with high levels of functioning. On average, participants had no more than 1 ADL limitation and between 1.1 and 1.4 IADL limitations.

The employment characteristics of participants were similar with respect to average monthly hours worked (122 hours in both states). In Texas, the most prevalent industry of employment was health care and education (29%), while participants in Minnesota were equally distributed across the three industry categories. There were also similarities in job types across the two states: service was the most common occupation; however a significantly higher proportion of DMIE participants in Minnesota were employed in service-related jobs compared with those in Texas (40% versus 34%, respectively).

Results

Impact on disability benefits received within 12 months

We examined impacts of the early intervention on the receipt of SSDI or SSI benefits within a year of DMIE enrollment (Table 2). After controlling for participant characteristics, we found the intervention significantly reduced the likelihood of receiving SSA benefits within a year of DMIE enrollment (OR = 0.56, p = 0.047) in the combined sample. We also found that the DMIE had a significant impact for Texas participants (OR = 0.48, p = 0.036), as shown in Table 3.

The multivariate analysis accounted for baseline demographic characteristics, health and functional status, employment measures, and prior SSA applications (Table 2). Results suggest that currently married participants had a significantly lower likelihood of receiving benefits compared with other participants (OR = 0.28, p = 0.016). Working adults with a higher physical SF-12 score had a lower likelihood of disability benefit receipt. Although industry and job type had no bearing on benefit receipt,

Table 3
Logistic regression analysis of disability benefits received within one year of the DMIE, by state (Minnesota: N = 926, pseudo R-squared = 0.1808; Texas: N = 1353, pseudo R-squared = 0.2620)

	Minnesota			Texas		
	Odds ratio	Z statistic	p value	Odds ratio	Z statistic	p value
DMIE intervention group	0.632	−0.63	0.526	0.483	−2.10	0.036
Age (mean years)	1.044	1.32	0.186	1.029	1.25	0.210
Male	0.678	−0.51	0.609	2.266	1.78	0.075
Currently married	0.337	−1.01	0.311	0.240	−2.27	0.023
White and Non-Hispanic	1.181	0.19	0.849	0.634	−1.04	0.297
High school education and beyond	0.821	−0.28	0.776	0.558	−1.54	0.124
Mental SF-12 score	0.993	−0.22	0.827	1.001	0.09	0.930
Physical SF-12 score	1.018	0.43	0.664	0.904	−4.37	<0.001
Total ADLs	0.640	−1.38	0.167	0.851	−1.11	0.267
Total IADLs	1.599	2.25	0.025	1.106	0.79	0.428
Average monthly hours worked	0.980	−3.01	0.003	0.989	−3.46	0.001
Education/health care industry	1.235	0.26	0.798	0.714	−0.80	0.422
Trade/transportation/utilities industry	0.190	−1.44	0.151	0.506	−1.00	0.316
Leisure/hospitality industry	0.726	−0.33	0.738	0.771	−0.43	0.666
Professional/technical occupation	0.439	−0.53	0.598	1.442	0.58	0.559
Clerical/sales occupation	2.190	0.67	0.505	0.980	−0.03	0.975
Service occupation	1.276	0.20	0.844	1.878	1.18	0.240
Any prior SSA applications	1.113	0.12	0.905	3.625	3.54	<0.001

Source: UDS variables submitted by Minnesota and Texas. SSDI and SSI benefit receipt data from SSA Ticket Research File [TRF].

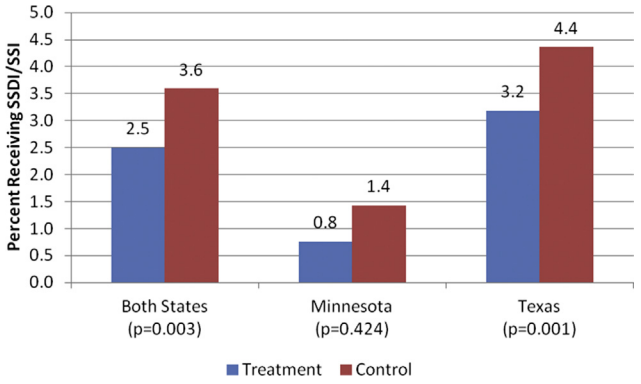

Fig. 1. Adjusted percent of participants with disability benefits received within 12 months of DMIE enrollment in treatment and control groups, by state. (Source: UDS variables submitted by Minnesota and Texas. SSDI and SSI benefit receipt data from SSA Ticket Research File [TRF].)

working more hours per month at baseline was associated with a lower likelihood of benefit receipt. Finally, a person with any prior history of SSA applications before DMIE enrollment was more than twice as likely to receive disability benefits within 12 months compared with participants who had no prior SSA applications.

In addition to the combined sample analysis, we examined DMIE program impacts for Minnesota and Texas separately (Table 3). In Minnesota, the odds ratio point estimate for DMIE participation was 0.63, but this finding was not significant at the 5% level ($p = 0.526$). In Texas, the DMIE intervention reduced the likelihood of SSA benefit receipt within 12 months (OR = 0.48, $p = 0.036$). Currently married participants and those with a higher physical SF-12 score in Texas were less likely to receive disability benefits. Finally, Texas DMIE participants with a prior history of SSA applications were more than three times as likely to receive disability benefits within 12 months of DMIE enrollment.

Marginal effects of the DMIE program are illustrated in Fig. 1. The figure displays the actual proportion of control group members receiving SSA disability benefits. For the treatment group, the adjusted likelihood of federal disability benefit receipt is displayed, which is calculated as the likelihood of receipt for the control group plus the marginal effect of participation in the DMIE. Because the marginal effect differs with each point of evaluation in a nonlinear model, the marginal effect was calculated for each observation and then averaged. Average marginal effects and associated p-values were calculated using the margeff command in STATA.[12]

Consistent with the odds ratios, the marginal effect of DMIE participation is significant in reducing SSA benefit receipt in the combined two-state sample and Texas, but not in Minnesota. In the combined two-state sample, the DMIE is associated with a decline in SSA benefit receipt from 3.6% among control group members to 2.5% among treatment group members. The percentage point difference is even larger in Texas: 4.4% of the treatment group is predicted to receive benefits compared with 3.2% of the control group.

Discussion

Findings from the DMIE evaluation show the early interventions were effective in significantly reducing the likelihood of federal disability benefit receipt after 12 months. Combining data from Minnesota and Texas, we found that the treatment group had a lower likelihood of federal disability benefit receipt (OR = 0.56, $p = 0.047$). In addition, we found significant impacts in Texas (OR = 0.48, $p = 0.036$). However, in Minnesota, the direction of the odds ratio point estimate for DMIE participation was similar to that of Texas, but was not significant at the 5% level. One possible explanation is that having a smaller sample size in Minnesota diminished the power to detect a significant impact at the 5% level.

Targeting early interventions for vulnerable, low-income populations can be effective in preventing or forestalling dependence on federal disability benefits within one year. Minnesota and Texas built their recruitment efforts around existing public insurance and safety net programs that provided health insurance coverage for low-income residents who were at risk of applying for disability benefits. However, Texas had a higher rate of disability benefit receipt than in Minnesota, which could be due to differences in each state's target population. For example, Texas recruited an older population compared with Minnesota and the likelihood of SSA program application tends to increase with age. Also, Minnesota focused its efforts exclusively on younger participants with severe mental illness. Texas focused not only on participants with severe mental illness, but also workers with chronic physical conditions occurring with a behavioral health condition.

The presence of multiple conditions may be a proxy for severity of illness, which would suggest a higher likelihood of seeking SSA disability benefits compared with workers at an early stage of a chronic physical condition. Working adults in the middle of their disability trajectory may be more responsive to an early intervention. The concept of a disability trajectory suggests that people have physical, sensory, emotional, or mental impairments that are relatively mild at first.[13] However, due to underlying biologic processes or lack of access to services, these impairments can lead to functional limitations that diminish the capacity to work.

The inclusion of navigators or person-centered case managers was a vital component in the design of early interventions for both states.[14] Although we cannot attribute the impacts of the DMIE to the navigator component by itself, both states emphasized that person-centered case managers greatly helped participants by establishing a personal connection with the DMIE program and addressed barriers to needed services. Furthermore, by conducting

an initial assessment of needs and goals with participants one-on-one and following up with each participant on a monthly or bi-weekly basis, the navigators provided a service coordination function that enabled some participants to access existing services and possibly avoid submitting a federal disability application as a "last resort" option.

Early interventions that build upon or wrap around existing programs can help address the problem of underinsurance. As noted previously, the DMIE program is not an insurance program in itself. Thus, elements such as the personal navigators may be relevant to states that choose to implement Medicaid expansions. Although it is difficult to calculate the magnitude of future benefits, our findings suggest that in low-income populations, early intervention efforts similar to the DMIE may reduce federal outlays of disability cash payments. In turn, this may help to offset some portion of the cost for DMIE services. With a large and growing population of adults with potentially disabling conditions, even a modest effect size for a well-targeted early intervention can produce substantial cost savings from a societal perspective.

Study limitations

This study had several limitations. First, we examined the impacts of the state programs 12 months after participants enrolled—a limited time period in which to observe changes in health status and the receipt of disability benefits. Second, we cannot measure the effects of individual components of the DMIE program because the study was not designed to test the comparative effectiveness of individual services. Accordingly, our impact estimates account for the entire package of services provided by the DMIE. Finally, the DMIE study populations were uniquely recruited to meet each state's eligibility criteria and do not represent the entire population of working-age adults with potentially disabling conditions within each state. These results may therefore not be generalizable to other working-age adult populations.

Conclusion

Workers with mental health conditions are at risk of leaving the work force and receiving disability benefits if their condition deteriorates to the point of becoming a work limitation. Workers with mental health conditions are candidates for early interventions that combine enhanced medical services, job supports, and service coordination assistance. By maintaining health and employment, such early interventions can forestall enrollment in federal disability programs. A critical component of this intervention is to help workers navigate a complex array of health and employment services, and obtain those services which best meet each individual's needs.

Policymaker interest in early interventions to forestall dependence on federal disability benefits has grown in recent years due to the need to identify strategies that can reduce the backlog of disability applications and improve the future solvency of the SSDI trust fund.[15] This study has shown that a well-designed early intervention targeted to a low-income population with mental health conditions can be effective in reducing dependence on federal disability benefits.

Lessons from the DMIE may provide insights for services needed by working adults who become newly eligible for Medicaid in 2014. Some adults may become dual eligible after qualifying for SSA benefits and Medicare after a two-year waiting period. Therefore, early interventions that forestall the receipt of SSA disability benefits may influence the growth of dual eligibles and demand for health care. Although the evaluation did not include a cost-benefit analysis, our findings suggest that reductions in federal cash payments for disability could help to offset expenses related to DMIE program services. Future studies that include a cost-effectiveness analysis of early interventions and personal navigators are needed. Maintaining employment can provide many social and personal benefits, including greater independence, community participation, and tax revenues.

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