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Short Communication

Financial stress and depressive symptoms: the impact of an intervention of the Chicago Earned Income Tax Periodic Payment

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Introduction

Over 22.7 million adults in the United States have been told by a healthcare provider that they have depression.[1] A particularly important antecedent of depression and other mental health concerns is stressful circumstances and socioeconomic position.[2] In fact, perceived financial strain is considered one of the strongest predictors of psychological distress[3] and numerous scholars find that financial stress is associated with depressive symptoms.[4] Given the robust link between economic strain and mental health, one vital point of intervention may be to target perceived financial stress. Therefore, we describe and evaluate an adapted version of the Earned Income Tax Credit (EITC) Program, which provided advanced periodic payments to low-income families in an attempt to alleviate the uncertainty and distress associated with living 'paycheck-to-paycheck.'

Traditionally, the EITC is delivered in a lump sum once a year as part of the annual tax refund. Between 1978 and 2010, advanced credits delivered via individuals' paycheck was an option, although only 3% of eligible filers took advantage of it. Past evaluations confirm that most families preferred the traditional lump sum and used the funds differently than their regular income.[5] Contributing to these observations was the relatively small size of EITC payments, and that the delivery mechanism was via the recipients' paycheck. Participants also complained that filing for advanced payments was administratively cumbersome for employers, and particularly for small-scale companies.[6] Nevertheless, according to the rational choice theory,[7] advance payments would be justifiable and preferable, given that low-income families could receive the money ahead of time and may choose to either earn interest in a savings account or pay any debt that incurs interest or fees. Current vs delayed rewards, as proposed by the delay discounting theory,[8,9] may also offer incentive for receiving advanced payments. In any case, advanced periodic payments would provide low-income families with better control of current finances, which could have the potential to lower financial stress. In this

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study, we assess if participation in the EITC advanced periodic payment is associated with lower financial stress compared with the typical annual lump sum payment. Consequently, we also test whether lower levels of financial stress were associated with lower levels of psychological distress in the form of depressive symptoms.

Methods

Sample

Data for this study come from a unique field experiment called the Chicago Earned Income Tax Credit Periodic Payment Pilot that was conducted in 2014–2015. Participants in the intervention group ($n = 343$) received periodic payments constituting a total of 50% of their 2015 projected tax credit disbursed over four time periods. Participants in the control ($n = 164$) group received one traditional lump sum payment disbursed with their annual tax refund. Survey data were completed online and/or by phone. Data were collected in four periods. A baseline (T1) data before any payment was made. The T1 data were collected between March and June 2014. The second data collection (T2) occurred in June–July, after the first two periodic payments were made in March–June. After the third periodic payment was made in October, the third data collection (T3) was carried out between November and December 2014. The last periodic payment was received in December 2014. The last data collection (T4) occurred after the fourth and last periodic payment was made and participants filed their 2015 tax returns, which occurred between January and May 2015 (T4). Of the participants in the sample, 293 were followed through T4, 76 (46%) in the control group and 217 (63%) in the intervention group. Out of those, 222 had data on depressive symptoms in T3 and T4—53 in the control group and 169 in the intervention group. An analysis of study retention (not shown) indicates that attrition was more common in the control group. Attrition was negatively associated with Patient Health Questionnaire (PHQ)-8 levels and age, but there were no differences based on financial stress. Individuals in the periodic EITC intervention group were less likely to have available data on PHQ-8 in T3 and T4 than those in the control group. Informed consent was obtained from participants in the study, which was approved by the institutional review board at University of Illinois at Urbana–Champaign.

Measures

PHQ-8: The eight-item Patient Health Questionnaire depression scale (PHQ-8) is considered a valid diagnostic measure of major depression.[10] The final score, which ranges between 0 and 24, is obtained by summing the scores for each item.

Financial stress. Financial stress was estimated using a modified version of the validated 8-item InCharge Financial Distress/Financial Well-Being Scale (IFDFW).[11,12] Scores range from 1, representing the lowest stress, to 5, representing overwhelming financial distress/lowest financial well-being.

Covariates. Covariates included age at baseline (years), sex, educational attainment (less than high school [HS], high school [HS]/General Educational Development [GED], some college or more), relationship status (in a romantic relationship vs not) and number of children in the baseline.

Statistical analysis

Repeated mixed-effects linear regression was used to analyse the influence of the EITC intervention on longitudinal changes in PHQ-8 and financial stress. Repeated mixed-effect regressions handle nested-data inherent to repeated observations within individuals. In addition, repeated mixed-effect regressions are appropriate for handling correlated data on subjects. Our analyses evaluated whether changes in financial stress mediated the relationship between study group and depression symptoms. First, we evaluated how the intervention was associated with depression symptoms. Second, we evaluated whether financial stress was associated with the intervention. The final model included lagged financial stress (1-wave), controlling for baseline age, education, relationship status, and number of children. The model also included an interaction term for the group assignment and wave. Random effects for the intercept were included to allow individuals to vary in the initial level of depression. In analyses (not shown), we further assess the mediation effects for multilevel data using the ml_mediation command in STATA. All data analyses were conducted using statistical software STATA SE 14.

Results

A majority of the sample was composed by African Americans (89%) and 96% of participants were female; 37% had less than HS education, and the average age was 42 years (standard deviation [*SD*] = 16.4) with no differences across intervention and control groups. The control group had a higher mean depression score (PHQ-8) of 6.7 ($SD = 5.8$) than the intervention group at T3 (5.0, $SD = 5.6$; $P < 0.10$). Mean depression score at T4 decreased for both groups but remained higher among the control group compared with the intervention group (4.9 vs 3.4, respectively, $P < 0.05$). Financial stress in T1 was higher among the intervention group than among the control group (3.7 vs 3.4, respectively, $P < 0.05$). However, we found that financial stress did not differ between intervention and control groups in T2 and T3. Mean financial stress scores among the control group increased from 3.4 at T1 to 3.9 in T3 but reduced to 3.5 at T4. Mean financial stress scores among the intervention group remained relatively constant in T1, T2, and T3 (mean = −3.7), but also reduced to 3.5 at T4. A higher proportion of participants in the control group were in a romantic relationship than those in the intervention group (43% vs 23%, respectively, $P < 0.01$). Those in the intervention group had a higher number of children than those in the control group (3.2 vs 2.8, respectively, $P < 0.10$).

Results (not shown) indicated that the intervention was associated with depression symptoms. According to the results, the intervention group showed lower levels of depressive symptoms than those in the control group ($\beta = -1.64$, $P < 0.05$). Second, we evaluated whether financial stress was associated with the intervention. Results indicated that, financial stress was higher among the intervention group at

baseline. Nonetheless, over time, financial stress increased in the control group until T3, declining afterwards (as participants approached the 2015 tax returns). In the intervention group, financial stress declined from T2 to T4. Finally, we tested whether the effect of intervention decreased on including financial stress in the regression. Results based on repeated mixed-effects linear regression (Table 1) indicate that participants in the intervention and control groups did not differ on PHQ-8 levels once differences in financial stress are taken into account. Financial stress was positively associated with higher PHQ-8 levels in this sample ($\beta = 2.22$, 95% confidence interval 1.58–2.87, $P < 0.01$). Results indicate that the intervention influenced the financial stress, which in turn, influenced depression. This is confirmed by further mediation analyses (not shown) that indicate that 14% of the association between the intervention and depressive symptoms is mediated by financial stress. Levels of financial stress similar to the sample (3.4–3.9) were associated with PHQ-8 levels between 4 and 5, which are in the range of mild depression.[10]

Discussion

The primary goal of this article was to assess whether advanced periodic payments of EITC were associated with fewer depressive symptoms. Results indicate that at T3 and T4, those receiving periodic payments had, on average, lower PHQ-8 scores than those receiving the standard lump sum EITC. Even though levels of financial stress were high for both groups, indicating poor financial well-being, the financial stress among the control group increased between T1 and T3, only reducing at T4 as they approached the 2015 tax returns. Mediation analyses indicated that intervention was associated with depressive symptoms and with financial stress. When accounting for financial stress, the relationship between the intervention and depressive symptoms was no longer significant. Therefore, it seems that periodic payments are associated with lower levels of financial stress in between lump sum payments, which in turn accounted for the variability in depressive symptoms in this sample.

Ultimately, our findings highlight the importance of financial stress as a point of intervention for programs and public policies targeting socioeconomic disparities in health. Financial stress for many takes a debilitating toll on the well-being of individuals and families. Moreover, stress as a mechanism between socioeconomic position and mental health is consistent with commonly discussed stress theories.[13] Our results suggest that policies that were designed with a goal of reducing inequality may also be used to address disparities in mental health and other wellbeing outcomes. A possible path for reducing inequality in its broader sense (not just economic inequality) is by adjusting social policies in a manner that provides disadvantaged individuals continuous support or resources throughout the year. Future studies should further investigate if providing continual support also facilitates higher probability of long-term social mobility as a result of increased financial stability and improved mental health. For example, greater predictability of financial resources and more stable mental health may be related to stronger labour force attachment and lower absenteeism from work, which are both associated with social mobility.[14]

As with any study, our results must be evaluated in the context of some limitations. The study did not randomize participants into intervention and control groups. Further studies should implement a randomized design to avoid selection bias. The sample size is small, particularly at T4 due to some attrition. Results based on multiple imputations (not shown) indicate a consistent detrimental effect of financial stress on depressive symptoms. However, the benefits of the intervention become less clear as those in the control group experience changes in perceived stress and depressive symptoms as they approach the time to receive the EITC lump sum. The results largely represent the experience of African American women, many of whom were not married. There is evidence that women not only report higher levels of financial stress but also depressive symptoms.[15] It should also be noted that the financial stress measure was a modified version of the 8-item InCharge Financial Distress/Financial Well-Being Scale.[11] Finally, we did not have information on PHQ-8 levels in T1 and T2, which limits the understanding of PHQ-8 trajectories in this sample.

In sum, we highlight that lower levels of financial stress are associated with lower levels of depressive symptoms. There is some evidence that a change in the current payment form of EITC funds may improve the quality of life for some low-income recipients in the United States, as it seems to reduce perceived financial stress.

Table 1 – Estimated parameters from repeated mixed-effect regressions on continuous PHQ-8 outcome measures.

Variables	Adjusted coefficients	P-value	95% confidence interval	
Intervention group	−1.26	0.096	−2.74	0.23
Wave 4	−1.08	0.165	−2.60	0.44
Group*wave	−0.45	0.613	−2.19	1.29
Financial stress	2.22	<0.001	1.58	2.87
Age	−0.02	0.317	−0.05	0.02
Gender				
Female	1.16	0.427	−1.71	4.03
Education				
HS or equivalent (GED)	−0.92	0.364	−2.92	1.07
Some college or more	−0.95	0.111	−2.12	0.22
In a romantic relationship	0.84	0.164	−0.34	2.03
Number of children	−0.01	0.939	−0.36	0.34
Constant	−2.11	0.361	−6.64	2.42

GED, General Educational Development; HS, high school; PHQ, Patient Health Questionnaire.
* - Interaction.

Author statements

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Ethical approval

University of Illinois at Urbana–Champaign Institutional Review Board.

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Competing interests

None declared.

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