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Poverty and perceived stress: Evidence from two unconditional cash transfer programs in Zambia

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ABSTRACT

Introduction: Poverty is a chronic stressor that can lead to poor physical and mental health. This study examines whether two similar government poverty alleviation programs reduced the levels of perceived stress and poverty among poor households in Zambia.
Method: Secondary data from two cluster randomized controlled trials were used to evaluate the impacts of two unconditional cash transfer programs in Zambia. Participants were interviewed at baseline and followed over 36 months. Perceived stress among female caregivers was assessed using the Cohen Perceived Stress Scale (PSS). Poverty indicators assessed included per capita expenditure, household food security, and (nonproductive) asset ownership. Fixed effects and ordinary least squares regressions were run, controlling for age, education, marital status, household demographics, location, and poverty status at baseline.
Results: Cash transfers did not reduce perceived stress but improved economic security (per capita consumption expenditure, food insecurity, and asset ownership). Among these poverty indicators, only food insecurity was associated with perceived stress. Age and education showed no consistent association with stress, whereas death of a household member was associated with higher stress levels.
Conclusion: In this setting, perceived stress was not reduced by a positive income shock but was correlated with food insecurity and household deaths, suggesting that food security is an important stressor in this context. Although the program did reduce food insecurity, the size of the reduction was not enough to generate a statistically significant change in stress levels. The measure used in this study appears not to be correlated with characteristics to which it has been linked in other settings, and thus, further research is needed to examine whether this widely used perceived stress measure appropriately captures the concept of perceived stress in this population.

Stress is a determinant of poor mental health, a leading cause of disability in high-, middle- and low-income countries (Vos et al., 2015), and an important determinant of overall well-being. Therefore, it is important to measure stress as an outcome in its own right (Haushofer and Shapiro, 2016; Kling, 2007). Stress and mental health are both closely linked to poverty; studies from low- and middle-income countries have revealed a link between poor mental health and socioeconomic status (SES) indicators such as education, food insecurity, housing, social class, and financial stress (Lund et al., 2010). Given the adverse effects of poverty on mental health, this study hypothesized that a poverty-alleviation program (an unconditional cash transfer) would reduce poverty among poor households in Zambia and subsequently reduce stress in these households.

There are several hypothesized mechanisms through which poverty may influence mental health, including chronic stress, malnutrition, substance abuse, social exclusion, and exposure to trauma and violence. Known as the *social causation hypothesis*, it has been studied extensively (Johnson et al., 1999; Lund et al., 2011). In what is known as the *social drift hypothesis*, people with mental illness are at an increased risk of experiencing poverty through increased health expenditures, reduced productivity, and

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stigma related to mental health (Lund et al., 2011). Thus, poverty and poor mental health mutually reinforce each other (Lorant et al., 2003; Lund et al., 2011). Poverty and low SES may also affect an individual's exposure to stress and stressful life events as well as his or her ability to cope with stress, as fewer social and psychological resources are usually available to overcome stressful events (Adler et al., 1994; Cohen, 1988; Cohen and Janicki-Deverts, 2012; Hamad et al., 2008).

Stress as a mechanism that links poverty and health merits further investigation. Psychological stress, which occurs when the experience of environmental demands exceeds an individual's ability to cope with the situation (Lazarus and Folkman, 1984), is associated with a range of physical and mental health states. It has been linked to depressive disorder, depressive symptoms, cardiovascular disease, and the risk of progressing from HIV infection to AIDS (Cohen et al., 2007). Experimental studies have shown that acute and chronic stressors can produce biological stress reactions, including excessive inflammation (McEwen and Seeman, 1999). Over the course of a lifetime, these reactions may contribute to morbidity and mortality disparities and increased levels of cortisol, particularly for stressors of an uncontrollable nature (Miller et al., 2007). Poverty-induced chronic stress has also been hypothesized to accelerate the natural aging of the immune system (referred to as *immunosenescence*) (Aiello and Dowd, 2013). Studies have demonstrated that individuals of lower SES show an increased antibody response to persistent herpes viruses, which may be due to differential exposure to stress (Aiello and Dowd, 2013) and reduced resources to cope with it (Kristenson et al., 2004). Aiello and Dowd hypothesized that increased stress, caused by a range of poverty-associated factors such as continuously activated stress-related autonomic and neuroendocrine responses, impairs immunity and leads to poor health outcomes. Maternal perceived stress has been associated with low birth weight and poor childhood nutritional status (Dole et al., 2003; Lobel et al., 1992; Rondó et al., 2013; Torche, 2011).

The majority of studies that examine the relationship between stress, SES (Cohen and Janicki-Deverts, 2012; Matthews et al., 2010), and stressful life events are associated with higher levels of perceived stress (Dowd et al., 2014; van Eck et al., 1998). These variables have been studied less in sub-Saharan African countries, where food insecurity (Pike and Patil, 2006) and HIV infection (Garcia et al., 2013) are more widespread, which may have implications for variation in stress levels by SES. A South African study found that perceived stress was related to subjective social status but not to other socioeconomic indicators, such as education, employment, and income (Hamad et al., 2008). A Kenyan study among farmers demonstrated that elevated levels of cortisol and self-reported stress were induced by the absence of rain, which caused a negative income shock (Chemin et al., 2013). Another study found a reduction in self-reported stress due to unconditional cash transfers (a positive income shock), but no impact on cortisol levels (Haushofer and Shapiro, 2016). A key issue in all of these studies is the use of measures of stress that have not been validated in sub-Saharan Africa and that, therefore, may not be appropriate in low-income settings of sub-Saharan Africa.

This study posited that cash transfer programs to improve food security and smoothing consumption would lead to reduced stress levels in a poor- and food-insecure setting in sub-Saharan Africa. Cash transfer programs directly aim at alleviating poverty and not at improving outcomes in mental health and related areas. Thus, the impacts of the cash transfer must first work through household-level outcomes such as food security, economic security, time use and labor decisions, and general stress levels. Then, the impacts make their way to individual-level outcomes, such as physical and mental health, perceived stress, expectations, and outlook.

To date, certain studies in Kenya and Malawi have demonstrated that social cash transfers have improved mental health by decreasing the rate of depressive symptoms (as measured respectively by the Center for Epidemiologic Studies Depression Scale [CES-D] and the General Health Questionnaire [GHQ-12]). Evidence from Malawi suggests that the effects of cash transfers on depressive symptoms depend on program design, specifically the combinations of conditions and transfer amounts. Other studies have reported mixed impacts on cortisol levels of cash transfer beneficiaries, including protective impacts among Mexican children and no impacts among adults in a Kenyan sample (Baird et al., 2013; L. Fernald and Gunnar, 2009; Haushofer and Shapiro, 2016; Kilburn et al., 2015).

Current evidence on the relationship between cash transfer programs and perceived stress is mixed. There are examples of studies that have examined this relationship in Latin America (Ozer et al., 2011; Schady and Paxson, 2007) and Africa (Haushofer and Shapiro, 2016). In Mexico, participation in the *Oportunidades* program was associated with lower depression, and reduced perceived stress [measured by the Perceived Stress Scale (PSS)] was found to be the mediating factor in women (Ozer et al., 2011). In contrast, in Ecuador, participation in an unconditional cash transfer program had no significant effect on perceived stress (measured using a four-item version of the PSS) or on symptoms of depression (Schady and Paxson, 2007). In Kenya, participation in a cash transfer program reduced perceived stress (measured by the Cohen PSS) but not cortisol levels in the overall sample. Nonetheless, reductions in cortisol were seen among some subsamples, such as female recipients and participants who received lump-sum transfers rather than monthly transfers (Haushofer and Shapiro, 2016). On a related note, two additional studies examined the impacts of loan access and the provision of health care on perceived stress. A Kenyan study found that health care receipts reduced perceived stress (Chemin et al., 2016). A South African study found that, among individuals who were initially not offered a small loan, a second chance to receive the loan increased the levels of perceived stress (Fernald et al., 2008).

As outlined above, the evidence to date on poverty alleviation and perceived stress is mixed, and therefore the present study aimed to investigate (1) whether participation in a cash transfer program reduced poverty-related outcomes and perceived stress and (2) which individual- and household-level characteristics are associated with higher levels of perceived stress. To investigate these questions, data from longitudinal impact evaluations of two government cash transfer programs in Zambia were used. It is important to note that neither program was designed to address stress, but rather to address food insecurity and extreme poverty. Nevertheless, given the theoretical link between poverty and stress, and the fact that food insecurity is a widespread problem in this population, it is of policy and public health interest to assess the link between the programs and perceived stress.

1. Method

1.1. Interventions

The Zambia Child Grant Program (CGP) is a government-run unconditional cash transfer program targeting households with a child under the age of five. The CGP's objectives include supplementation of household income, increased enrollment and attendance in primary school, reduced child morbidity, productive assets, food security, and improved mortality and nutrition. Districts for program implementation were targeted by the government because of their high rates of mortality, morbidity, stunting,