



Original article

## Assessing the Association Between Depression and Savings for Kenyan Youth Using a Validated Child Depression Inventory Measure



Njeri Kagotho, Ph.D.<sup>a,\*</sup>, Michele Patak-Pietrafesa, M.S.W., L.I.S.W.-S.<sup>a</sup>,  
 Fred M. Ssewamala, Ph.D., M.S.W.<sup>b,c</sup>, and Gwyneth Kirkbride, L.M.S.W., L.M.T.<sup>c</sup>

<sup>a</sup>The Ohio State University College of Social Work, Columbus, Ohio

<sup>b</sup>Brown School of Social Work, Washington University in St. Louis, St. Louis, Missouri

<sup>c</sup>International Center for Child Health and Development, Washington University in St. Louis, St. Louis, Missouri

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### ABSTRACT

**Purpose:** The Child Depression Inventory (CDI) is a commonly used measure of depression among youth and has been used in studies conducted in sub-Saharan Africa demonstrating positive effects of financial asset-building interventions on physical and mental health outcomes. However, before we can be certain that asset building does indeed improve mental health functioning, we must first be sure that the instruments used to measure mental health in this population are valid and culturally appropriate.

**Methods:** This two-part study used baseline data from a sample of youth ( $N = 1,348$ , 13–18 years) participating in the YouthSave-Impact Study Kenya to clarify the psychometric properties of the 10-item CDI (study A), and then used the 10-item CDI to assess the relationship between financial assets and mental health functioning among this sample of adolescents (study B).

**Results:** Factor analysis on the 10-item CDI indicated a one-factor eight-item measure with excellent model fit. Invariance testing indicated that the measure performed differently for male and female respondents. Finally, using the latent structure as the dependent variable, the second part of the analysis established that cash savings were associated with depression. Female and male adolescents with savings reported lower depression (female  $\beta = -.17$ ,  $p \leq .003$ ; male  $\beta = -.12$ ,  $p \leq .020$ ) than other youth.

**Conclusion:** This study identified a reasonable one-factor eight-item depression measure that was noninvariant across gender. This validated measure was used to confirm the association between financial assets and mental health outcomes, hence, supporting the hypothesis that financial assets are associated with mental health outcomes.

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### IMPLICATIONS AND CONTRIBUTION

Persistent poverty poses a risk for depression in children. Asset-building interventions suggest that assets have a positive impact on mental health functioning. This study establishes a reasonable depression measure for Kenyan adolescents and uses the latent construct to confirm the association between assets and mental health functioning.

**Conflicts of Interest:** The authors have no conflicts of interest to disclose.

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\* Address correspondence to: Njeri Kagotho, Ph.D., The Ohio State University College of Social Work, 1947 College Road 325-E Stillman Hall, Columbus, OH 43210.

E-mail address: [Kagotho.1@osu.edu](mailto:Kagotho.1@osu.edu) (N. Kagotho).

Seventy-five percent of people living in poverty worldwide reside in Africa [1]. Severe and persistent poverty poses a substantial risk for mental illness and children exposed to persistent household poverty are at an increased risk for experiencing depression [2,3]. Despite the risk for depression among youth living in poverty in sub-Saharan Africa (SSA), few development programs to date have attempted to address the intersection of poverty and mental health in this population. Of notable

exception have been the region's economic strengthening interventions undergirded by an asset-based theoretical development framework [4]. This framework acknowledges that both personal- and institutional-level factors inform an individual's ability to accumulate financial assets, and these assets in turn have economic, psychosocial, and health behavior effects [4,5]. Economic strengthening interventions maintain that the benefits derived from current ownership of financial assets (not just use or consumption) result in both financial and nonfinancial benefits [6–8]. Indeed, several studies have demonstrated asset-building interventions' positive effect on mental health outcomes for SSA youth [9–11].

### *The Association of Financial Assets on CDI Scores*

In recent years, the Child Depression Inventory (CDI) has become a common measure used in community samples participating in asset-building interventions. Both 27- and 10-item versions of the CDI have been used to measure depression in asset-building focused studies in SSA. For instance, using a composite score for the 10-item CDI, Ssewamala et al. [9] found a significant reduction in depression symptoms of youth (mean age 13.71 years) who received an economic empowerment intervention compared with a control group whose depression scores did not decrease significantly. An additional study in Uganda utilizing the 27-item CDI found lowered depression levels in youth (ages 12–14 years) who received an economic empowerment intervention in contrast to control counterparts who reported no changes in depression levels [10].

Before we can be certain that asset-building can improve the mental health functioning of youth in SSA, we must first be sure that the survey instruments used to measure mental health in this population are valid, reliable, and culturally appropriate. The lack of valid assessment measures is one of the barriers to services faced by over 90% of people with depression worldwide [12]. Low-resource communities, such as those in SSA, typically have very few opportunities for quality mental health screening or treatment [12,13]. As such, the National Institute of Mental Health has recognized the need for culturally valid and reliable measurement tools as one of the Grand Challenges in Global Mental Health [14]. The systematic review of the literature by Mutumba et al. [15] further demonstrates this gap, pointing to a lack of rigorously validated mental health measures on the African continent.

### *The CDI as a Measure of Childhood Depression*

The CDI [16] is one of the most commonly used scales measuring depression among children and adolescents worldwide [17]. Originally published in 1977, the 27-item scale was developed to measure the core cognitive features of depression among children. The measure asks respondents to select one of the three statements best describing their mood/feelings: "I am tired once in a while," "I am tired many days," or "I am tired all the time" [16]. A shortened 10-item version of the CDI is also available which captures: "sadness," "pessimism," "self-deprecation," "self-hate," "crying spells," "irritability," "negative self-image," "loneliness," "lack of friends," and "feeling unloved." The 10-item takes less time to administer with comparable psychometric properties to the 27-item version [18]. However, the 27-item CDI consistently reports higher internal consistency

estimates compared with the 10-item [19] which could be attributed to the higher number of items [20].

Both the 27- and 10-item versions of the CDI have been adapted for use in several African countries [15,19]. In addition to culturally adapted English versions, several studies have constructed local language versions of the CDI including a Kiswahili version of the 27-item in Tanzania [21], an Arabic version of the 27-item in Egypt [22], and a Chichewa version of the CDI-II-S (12-item instrument) in Malawi [23].

The CDI seems to be robust to linguistic differences. In their meta-analysis of 331 alphas drawn from worldwide CDI studies, Sun and Wang [19] found that language was not a statistically significant indicator when included as a moderator in a test of heterogeneity. Age of samples has however produced varying results. Although the literature is mixed, the CDI is generally believed to capture different facets of depression between children and adolescents [24–26]. In addition, differences have been found in CDI scores across gender [25].

### *Present study*

This two-part study used baseline data from a sample of youth participating in the YouthSave-Impact Study Kenya (hereafter YouthSave Kenya) to clarify the psychometric properties of the 10-item CDI (study A) and then used the 10-item CDI to assess the relationship between financial assets and mental health functioning (study B). Factor analysis allows the researcher to minimize measurement error from scale scores allowing for better estimates of CDI depression scores. To our knowledge, this is the first attempt to validate the 10-item CDI among African adolescents. As noted previously, both the 27- and 10-item CDI have been used as an outcome measure in several youth economic intervention studies in SSA. However, these studies use cumulative CDI scores to denote "depression" and not the latent factor structure. The present study is the first attempt to establish the 10-item CDI's factor structure and psychometric properties in this population. Finally, because the CDI has been found to perform differently across child and adolescent samples—respondents from these two developmental stages comprehend and respond to the measure items differently—this present study accounts for this by analyzing data from a subsample of adolescents only.

## **Methods**

### *Sample*

This study analyzed data from a group of adolescents aged 13–18 years ( $n = 1,348$ ). The sample is drawn from the YouthSave Kenya study, which focused on school-going youth ( $N = 3,965$ ) ranging in age from 9 to 18 years. Using an experimental design, the YouthSave Kenya study measures the long-term impact of child and youth savings on developmental outcomes. Study measures capture household and individual saving practices, educational parameters, health and mental health outcomes, self-efficacy, and social relationships.

Inclusion in the study was open to youth in upper-primary school, classes five through seven. Participants were recruited from 90 public schools across five regions: the Coast, Mt. Kenya, Nairobi, the Rift Valley, and Western Kenya. A stratified random sampling procedure was used to assign schools to either treatment or control conditions with schools stratified into four strata

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