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Original article

Effects of a Combination Economic Empowerment and Family Strengthening Intervention on Psychosocial Well-being Among Ugandan Adolescent Girls and Young Women: Analysis of a Cluster Randomized Controlled Trial (Suubi4Her)

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A B S T R A C T

Purpose: Economic empowerment and family strengthening interventions have shown promise for improving psychosocial well-being in a range of populations. This study investigates the effect of a combination economic and family strengthening intervention on psychosocial well-being among Ugandan adolescent girls and young women (AGYW).
Methods: We harnessed data from a three-arm cluster randomized controlled trial among AGYW aged 14–17 years in 47 Ugandan secondary schools. Schools were randomized to either a youth development account intervention (YDA) [N = 16 schools], YDA plus a multiple family group intervention (YDA + MFG) [N = 15 schools], or bolstered standard of care (BSOC) [N = 16 schools]. We estimated the effect of each intervention (BSOC = referent) on three measures of psychosocial well-being: hopelessness (Beck's Hopelessness Scale), self-concept (Tennessee Self-Concept Scale), and self-esteem (Rosenberg Self-Esteem Scale) at 12 months following enrollment using multilevel linear mixed models for each outcome.
Results: A total of 1,260 AGYW (mean age, 15.4) were enrolled—471 assigned to YDA (37%), 381 to YDA + MFG (30%), and 408 to usual care (32%). Over the 12-month follow-up, participants assigned to the YDA + MFG group had significantly greater reductions in hopelessness and improvements in self-esteem outcomes compared to BSOC participants. Those enrolled in the YDA arm alone also had significantly greater reductions in hopelessness compared to BSOC participants.

IMPLICATIONS AND CONTRIBUTION

Adolescence is a critical period for improving health across the life course, yet most adolescent mental health care needs go unmet, particularly in resource-constrained settings. Combined economic and family-strengthening interventions can improve psychosocial outcomes (e.g., hopelessness and self-esteem) among in-school adolescent girls in these settings and should be scaled accordingly.

Discussion: Combination interventions, combining economic empowerment (represented here by YDA), and family-strengthening (represented by MFG) can improve the psychosocial well-being of AGYW. The long-term effects of these interventions should be further tested for potential scale-up in an effort to address the persistent mental health treatment gap in resource-constrained settings.

Mental health disorders were the second leading cause of years lived with disability globally in 2019 at nearly 15% and the leading cause of years lived with disability among youth aged 10—24 at 23% [1]. Approximately 50% of mental health disorders develop before the age of 18 and 65% before the mid-twenties [2]. As adolescents navigate the complex transition from childhood into adulthood, and caregivers lessen their involvement in adolescents' lives, adolescents may be particularly vulnerable to bullying, social isolation, and low self-esteem, which increase the risk of poor psychosocial health and mental health disorders [3]. Suboptimal mental and emotional health outcomes during adolescence have lifelong implications for an individual's overall well-being. As such, adolescence is a critical intervention period for improving health across the life course. Yet, most adolescent mental health care needs go unmet, with a pooled estimate of unmet needs exceeding 50% in adolescents globally [4].

Over 90% of the world's children live in low- and middle-income countries, where access to formal mental health care is highly limited. For adolescent girls and young women (AGYW) in these settings, suboptimal psychosocial well-being, including low self-esteem, self-concept and hopelessness, often equates to increased engagement in risky sexual behavior [5], drug and alcohol use [6], and experiences of sexual violence [7]. These outcomes can increase risk of HIV and other sexually transmitted infections. Our research suggests 16% of adolescent girls aged 14—17 years in Uganda have severe depressive symptoms and nearly one-third (30%) have moderate symptoms [8]. With a substantial unmet need for mental health care in this setting specifically, novel interventions are needed to bridge the mental health care gap, support and improve the psychosocial well-being of AGYW, and ultimately decrease the risk of long-term consequences attributable to poor mental health.

There is abundant evidence that demonstrates poverty and adolescent psychosocial well-being are closely intertwined [9]. Asset theory suggests that, in addition to improving economic stability, acquisition of assets may yield important psychosocial benefits such as increased feelings of security and self-efficacy, as well as hope for the future [10,11]. In line with this theory, economic empowerment (EE) interventions have shown promise for improving a range of psychosocial outcomes among adolescents [12—18]. Despite the promise of EE interventions in improving the well-being of children and adolescents, these interventions can take years to yield such improvements, and sustaining the benefits throughout adolescent development remains a challenge [16,17]. As such, there is a clear need for interventional supports that can help bolster the psychosocial benefits of EE interventions and sustain these benefits over time.

In addition to the direct physical and emotional consequences of poverty and economic instability, these factors have been shown to adversely impact the quality of family relationships, which can exacerbate poor psychosocial outcomes for youth [19,20]. For example, in a cohort of 347 adolescents followed for over 20 years, lower family socioeconomic status yielded fewer parenting investments in their children, which subsequently yielded higher levels of negative adolescent personality traits [21]. Family strengthening interventions have been shown to directly improve psychosocial outcomes among adolescents in multiple settings [22—25] and lengthen the benefits of improved family economic stability [26,27]. However, the psychosocial benefits of these interventions in combination with EE interventions have not been explored in AGYW who are particularly vulnerable to poor mental health as they navigate the complex transition into young womanhood.

In line with asset theory and empirical evidence from EE and family strengthening intervention trials in other populations, we hypothesized that a combination savings plus family strengthening intervention could support rapid improvement in the psychosocial well-being of AGYW in Uganda (Figure A1). In this work, we harnessed longitudinal data from a large (N = 1,260) cluster-randomized controlled trial, "Suubi4Her", originally aimed at reducing HIV risk in the population [28], to explore this hypothesis. Specifically, we quantify the effects of a savings and combination savings plus family strengthening intervention on three distinct measures of psychosocial well-being: feelings of hopelessness, self-concept, and self-esteem [29,30].

Methods

Setting

This three-arm cluster-randomized trial, previously described [8,18,28], was conducted in 47 secondary schools in the greater Masaka region of southwestern Uganda. School locations span five geopolitical districts—Rakai, Kyotera, Masaka, Lwengo, and Kalungu—and are geographically distant, minimizing risk of contamination across individuals and schools. These districts are some of the hardest hit by the HIV epidemic in Uganda, with district-level prevalence estimates as high as 17.8% [31,32].

Recruitment and study population

All potentially eligible participants were identified with the help of school administration and Masaka Dioceses. Flyers providing a brief overview of the study and enrollment steps were distributed to these individuals. Interested adolescents and their caregivers then met one-on-one with the in-country project coordinator to discuss eligibility, the voluntary nature and purpose of the study, extent of participation expectations, potential risks and benefits, and safety and confidentiality. To be eligible, participants had to be (1) female; (2) aged 14—17 years; and (3) in their first or second year of secondary school. Individuals who were living in an institution or orphanage were ineligible as one

component of the intervention is family-based. Written informed consent was obtained from the caregivers of interested and eligible adolescents. Adolescents provided written informed assent separately from caregivers to avoid coercion. In total, 1,260 adolescent girls were enrolled between March 2018 and February 2019 (Figure 1). Power and sample size calculations are reported in Ssewamala et al., 2018 [28] and Byansi et al. 2022 [18].

Randomization and treatment arms

Socioeconomic status of enrolled students, total enrollment, urbanity, and scholastic performance (based on Uganda Certificate of Education exams) were similar across included schools. As such, the data manager used the SPSS software random assignment feature to assign schools to one of the three treatment conditions described in detail below: (1) youth development accounts (YDAs) [N = 16 schools]; (2) a combination intervention comprising both YDAs and a multiple family group intervention (MFG) (YDA + MFG) [N = 15 schools]; or (3) bolstered standard of care (BSOC) [N = 16 schools].

Bolstered standard of care. The primary aim of this trial was to reduce HIV risk among AGYW so participants in the BSOC or

"control" arm received usual sexual health education offered to adolescents in the region. Sexual health education included information from the Adolescent Sexual and Reproductive Health curriculum, a sex and health education handbook, and information on gender equality.

Youth development account intervention arm. The YDA intervention arm included all components of the BSOC arm. In addition, a bank account was opened in the name of the adolescent, with her primary caregiver as a cosigner. To support long-term savings goals, participants were enrolled in a 1:1 matched savings program funded by the study in which matched funds could be used for activities that support adolescent development. These funds could be used to pay for school fees (with fees sent directly to the school's bank) and investing in a family-based income-generating activity (e.g., piggery, farming, and sewing). Access to matching funds was conditional on completion of financial management workshops covering income generation, use of financial institutions, saving, and asset-building during the intervention period.

Youth development accounts and multiple family group intervention arm. The YDA + MFG arm included all components of the
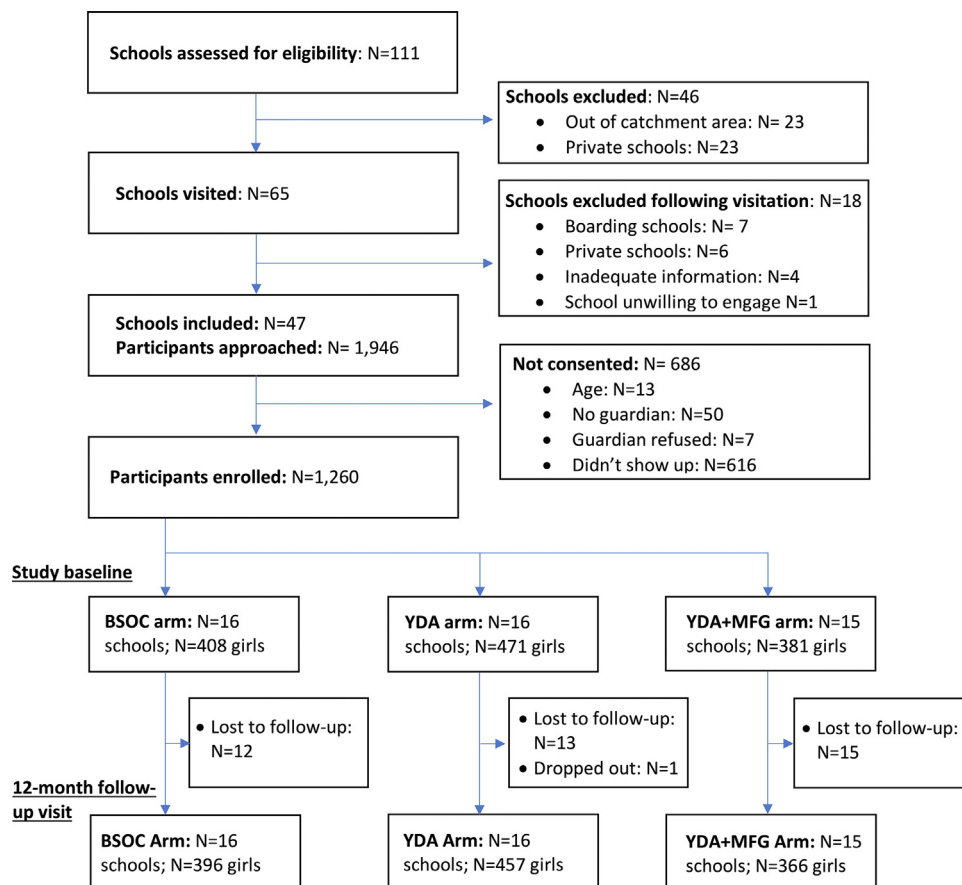

Figure 1. Consort diagram outlining enrollment and follow-up in Suubi4Her study (2017–2020). BSOC = bolstered standard of care; MFG = Multiple-family group; YDA = youth development accounts.

BSOC and YDA intervention plus a component that aimed to strengthen family relationships and support the psychosocial well-being of adolescents. This component, coined a MFG intervention, provided a safe setting for multiple families to gather and directly discuss family challenges, shared experiences, adolescent mental health challenges, and potential strategies for mitigating these challenges. Moreover, MFG addressed reduction of stigma around adolescent mental health and family challenges via normalization of the shared experiences of participants [28].

Ethical considerations

Participation in Suubi4Her was completely voluntary and participants retained the right to withdraw at any time during follow-up. This study was approved by the Institutional Review Board at Washington University in St. Louis (IRB- #201703102), the Uganda Virus Research Institute (GC/127/17/07/619), and the Uganda National Council of Science and Technology (SS4406). The study is registered in ClinicalTrials.gov (NCT03307226).

Study procedures

Following enrollment, participants were asked to complete a structured interview that lasted ~60 minutes and was conducted in Luganda, the local language, by a trained member of our research team (baseline assessment). Broadly, this interview asked respondents about their family relationships, psychosocial well-being, educational plans, physical health, sexual risk-taking, and socioeconomic situation. A follow-up interview including the same questions was conducted 12 months following enrollment into the trial. Of the 1,260 individuals enrolled in the trial, 1,219 (96.7%) completed a 12-month follow-up visit between June 2019 and February 2020 (Figure 1).

Measures

Hopelessness. Hopelessness is a "system of cognitive schemas whose common denomination is negative expectations about the future" [33]. Hopelessness was measured using the 20-item Beck Hopelessness Scale which includes items such as "my future seems dark" [33]. Response options are true/false and potential scale scores range from 0 to 20 with higher scores indicative of higher hopelessness. This tool has been validated among youth in neighboring Kenya [34] and demonstrated acceptable reliability in our other work among Ugandan adolescents [14]. Cronbach's alpha at baseline and 12 months in the present study were each 0.70.

Self-esteem. Self-esteem is a broad self-evaluation of one's perceived worth as a person [35]. Self-esteem was measured using the 10-item Rosenberg Self-Esteem Scale which includes items such as "on the whole, I am satisfied with myself" [35]. Responses range from "strongly disagree" to "strongly agree" and potential scale scores range from 0 to 30 with higher scores indicative of higher self-esteem. This tool has been widely used in Eastern Africa and has demonstrated acceptable reliability [36]. Cronbach's alpha at baseline and 12 months in the present study were 0.77 and 0.75, respectively.

Self-concept. Self-concept is a measure of an individual's thoughts and feelings about the self across multiple domains (e.g., physical appearance, social acceptance, and academic performance) [37]. This construct is distinct from self-esteem in that it moves from a unidimensional to multidimensional understanding of "self" [37]. Self-concept was measured using the 20-item Tennessee Self-Concept Scale: Second Edition Short Form which includes items such as "I don't do well in school, even when I try" [37]. Responses range from "always false" to "always true" and potential scale scores range from 20 to 100 with higher scores indicative of higher self-concept. This tool has demonstrated high reliability among Ugandan children and adolescents in our other work [14,38]. Cronbach's alpha at baseline and 12 months in the present study were both 0.83.

Sociodemographics

All sociodemographic variables were captured through participant self-report. Age, household size (i.e., number of total individuals living in household), and number of children within the household were measured and operationalized as continuous variables. Orphanhood status was determined by the number of known living biological parents reported by the participant. Caregiver categories were condensed to represent those with a biological parent, grandparent, or other individual as their primary caregiver. Participant financial savings were dichotomized as any versus none. Financial assets included 21 separate items (e.g., car, TV, banana garden, and so on.) which were summed and considered as a continuous measure.

Statistical analyses

Baseline characteristics were described in the study population overall and by intervention arm assignment. For each measure of psychosocial well-being, individual scale items were imputed using the mean of the individual's nonmissing items given fewer than 20% of items were missing [39]. We assessed the effect of each intervention (BSOC = referent) on each of the three measures of psychosocial well-being—hopelessness, self-concept, and self-esteem—at 12 months following trial enrollment using three separate multilevel, linear mixed models which accounted for the cluster-randomized trial design (where individuals are nested within schools, which were randomized, and observations are nested within individuals, with two observations per individual). In each model, we included fixed effects for a three-category study group variable (BSOC/YDA/YDA + MFG condition), a time variable (baseline/12-month follow-up), and a study group-by-time interaction term. We also estimated a school-level random intercept with an unstructured covariance matrix and accounted for repeated measures within subjects, specifying unstructured residual variances and covariances.

The primary coefficients of interest were the interactions between study group and time. We also assessed differences in means across groups at each time point (group-within-time simple effects) and differences in means across time points within each group (time-within-group simple effects). We hypothesized that each intervention would yield significantly greater improvements in each psychosocial outcome of interest compared to BSOC and that those enrolled in the YDA + MFG arm would benefit the most. All analyses were performed using SAS, v. 9.4 (Cary, NC).

Results

A total of 1,260 AGYW (mean age, 15.4) were enrolled in the trial with 471 (37.4%) in the YDA group, 381 (30.2%) in the YDA + MFG group, and 408 (32.4%) in the BSOC group (Figure 1; Table 1). The average household size was seven people (range 2—31; 95% confidence interval [CI]: 6.8, 7.2) and a majority of participants were cared for by a biological parent (N = 965; 77%) (Table 1). A total of 215 (17.1%) participants were orphaned (Table 1). Approximately 25% of study participants had some savings at baseline and the average number of household assets was 11.5 (range 0—20; 95% CI: 11.2, 11.7; Table 1).

At baseline, mean psychosocial scale scores in the study population overall were: hopelessness = 4.1 (range: 0—16; 95% CI: 3.8, 4.4); self-concept = 80.6 (range: 44—100; 95% CI: 79.3, 82.0); self-esteem = 23.4 (range: 3.6—30; 95% CI: 22.9, 23.9). Mean hopelessness, self-concept, and self-esteem scores were similar between each intervention group and the BSOC group (Table 2; Figure 2).

Between baseline and 12-month follow-up, mean hopelessness, self-concept, and self-esteem scores improved in each study group, though improvements in self-concept and self-esteem in the BSOC group were nonsignificant (Table 2). Compared to the BSOC condition, the YDA + MFG intervention yielded significantly greater decreases in hopelessness and significantly greater improvements in self-esteem by the 12-month follow-up visit (Table 3; Figure 2). While participants in this arm also had significantly greater self-concept scores at the 12-month follow-up visit when compared to BSOC participants (Table 2), there was no significant difference in the change in these scores between baseline and follow-up by study group (Table 3). Between baseline and the 12-month follow-up visit, the YDA intervention alone yielded significantly greater decreases in hopelessness when compared to the BSOC condition (Table 3). Though participants in the YDA intervention arm also had greater self-concept and self-esteem scores than those in the BSOC arm at the 12-month follow-up visit (Table 2), there were no significant differences in the change in these scores between baseline and follow-up by the study group (Table 3).

Discussion

Poor psychosocial well-being is common among AGYW, particularly in resource-constrained settings, contributing to a host of adverse health outcomes across the life course. In this setting in southwestern Uganda, nearly half of AGYW report moderate to severe depressive symptoms [8]. Despite such alarming levels of poor mental health, few interventions have centered on, and been proven effective at, rapidly improving the psychosocial well-being of this population. We assessed the effects of a savings and combined savings and family strengthening intervention on three separate measures of psychosocial well-being among 1,260 Ugandan AGYW over a 12-month follow-up period. While most measures of psychosocial well-being improved in participants across study groups, our results suggest the YDA + MFG was particularly effective at reducing hopelessness and improving self-esteem in this population.

We found that YDAs alone yielded a mean reduction in hopelessness scores of 0.9 points in AGYW over a 12-month follow-up period. This small absolute change is larger than that observed in a similar study among adolescents living with HIV and was significantly greater than the 0.5 point decrease observed in BSOC participants. Importantly, this change represents the potential of YDAs to have a more substantial impact on hopelessness over longer periods of follow-up. At odds with existing evidence, YDAs did not have a significantly greater effect on self-concept or self-esteem than BSOC [12—14,16,17]. It is possible that it may take longer to observe these benefits of YDAs as the evidence is mixed regarding the length of time required to see improvements in psychosocial health and how long benefits may be sustained beyond an EE intervention period [14,16,17]. For example, in our prior work in a population of adolescents living with HIV in the same region in Uganda, we found that an EE intervention similar to the one tested here reduced hopelessness in the subgroup of participants who had a high level of hopelessness at baseline, but only after 24 months and not among study participants overall (mean 24-month change of 4.0 points in subgroup and 1.5 in population overall) [14]. The subgroup effects of the intervention on hopelessness were not sustained beyond the intervention

Table 1
Characteristics of 1,260 adolescent girls and young women enrolled in the Suubi4Her economic empowerment trial conducted in southern Uganda 2017—2020[a]

	Total (N = 1,260)	Control (N = 408)	YDA (N = 471)	YDA + MFG (N = 381)
Age (Mean, 95% CI)	15.4 (15.2, 15.5)	15.2 (15.0, 15.4)	15.5 (15.3, 15.6)	15.4 (15.2, 15.7)
Orphanhood status, (N/%, 95% CI for %)				
Non-orphan	1,045/82.9 (80.4, 85.4)	342/83.8 (79.1, 88.6)	391/83.0 (79.4, 86.7)	312/81.9 (77.3, 86.5)
Orphan	215/17.1 (14.6, 19.6)	66/16.2 (11.4, 20.9)	80/17.0 (13.3, 20.6)	69/18.1 (13.5, 22.7)
Primary caregiver (N/%, 95% CI for %)				
Biological parent	965/76.6 (73.6, 79.5)	312/76.5 (72.1, 80.8)	370/78.6 (73.9, 83.3)	283/74.3 (68.6, 80.0)
Grandparent	140/11.1 (9.2, 13.0)	46/11.3 (8.9, 13.7)	54/11.5 (7.7, 15.2)	40/10.5 (7.2, 13.8)
Other	155/12.3 (9.8, 14.8)	50/12.3 (7.7, 16.8)	47/10.0 (6.3, 13.6)	58/15.2 (11.2, 19.2)
Household size (Mean, 95% CI)				
People in HH	7.0 (6.8, 7.2)	6.8 (6.5, 7.1)	7.0 (6.8, 7.3)	7.2 (6.9, 7.4)
Children in HH	3.5 (3.4, 3.6)	3.4 (3.2, 3.6)	3.5 (3.3, 3.7)	3.6 (3.3, 3.9)
Family assets (mean, 95% CI)	11.5 (11.2, 11.7)	11.2 (10.6, 11.9)	11.8 (11.5, 12.1)	11.3 (10.9, 11.6)
Any savings (N/%, 95% CI for %)				
No	957/76.0 (72.5, 79.4)	307/75.2 (70.5, 80.0)	352/74.7 (69.1, 80.4)	298/78.2 (71.3, 85.1)
Yes	303/24.0 (20.6, 27.5)	101/24.8 (20.0, 29.5)	119/25.3 (19.6, 30.9)	83/21.8 (14.9, 28.7)

CI = confidence interval; HH = household; MFG = multiple family group; YDA = youth development account.
[a] All reported values account for cluster-randomized study design.

Table 2
Mean, hopelessness, self-concept, and self-esteem scores at baseline and follow-up by treatment arm

Variable	BSOC mean (95% CI)	YDA mean (95% CI)	Mean difference of YDA and BSOC (95% CI)	YDA + MFG mean (95%CI)	Mean difference of YDA + MFG and BSOC (95% CI)
Hopelessness					
Baseline	4.1 (3.8, 4.4)	4.2 (3.9, 4.4)	0.1 (−0.3, 0.5)	4.3 (4.0, 4.7)	0.2 (−0.2, 0.7)
12-months	3.7 (3.4, 3.9)	3.2 (3.0, 3.5)	−0.4 (−0.8, 0.0)	3.3 (3.0, 3.5)	−0.4 (−0.8, 0.0)
Within group mean difference (12-months-baseline; 95% CI)	−0.5 (−0.8 to −0.1)	−0.9 (−1.2 to −0.6)		−1.1 (−1.4 to −0.7)	
Self-concept					
Baseline	80.6 (79.3, 82.0)	81.0 (79.5, 82.3)	0.4 (−1.5, 2.3)	80.9 (79.5, 82.3)	0.3 (−1.7, 2.2)
12-months	81.9 (80.5, 83.2)	83.7 (82.5, 85.0)	1.9 (0.1, 3.7)	83.9 (82.6, 85.3)	2.1 (0.2, 4.0)
Within group mean difference (12-months-baseline; 95% CI)	1.2 (−0.1, 2.5)	2.7 (1.5, 3.9)		3.0 (1.7, 4.4)	
Self-esteem					
Baseline	23.4 (22.9, 23.9)	24.1 (23.6, 24.6)	0.7 (0.0, 1.4)	23.4 (22.9, 23.9)	0.0 (−0.8, 0.7)
12-months	23.8 (23.4, 24.3)	24.7 (24.3, 25.2)	0.9 (0.3, 1.5)	24.8 (24.3, 25.3)	1.0 (0.3, 1.6)
Within group mean difference (12-months-baseline; 95% CI)	0.4 (−0.1, 1.0)	0.6 (0.1, 1.2)		1.4 (0.8, 2.0)	

BSOC = bolstered standard of care; CI = confidence interval; MFG = multiple family group; YDA =youth development account.

period (i.e., past the 24-month intervention period during which participant savings were being matched) [14]. Similar to the current findings, no impact was observed on self-concept potentially suggesting self-concept and self-esteem may function in a distinct manner when compared to hopelessness among youth in this setting. It is possible the YDA intervention tested here would improve both self-esteem and self-concept over a longer follow-up period (e.g., 24 months).

Few studies have assessed the effect of family strengthening interventions on the psychosocial well-being of AGYW in the region, and to our knowledge, no studies have assessed the effect of a combined savings and family strengthening intervention on the psychosocial well-being of AGYW. Though the magnitudes of change were small, our results suggest that the combination YDA + MFG intervention yielded greater reductions in hopelessness and improvements in self-esteem than the BSOC over a 12-month follow-up period. AGYW in the YDA + MFG group saw a mean reduction in hopelessness scores of 1.1 points and improvement in self-esteem scores of 1.4 points, while those in the BSOC arm saw changes of 0.5 and 0.4, respectively. Given the YDA intervention only yielded a meaningful impact on feelings of hopelessness, family strengthening may be important for improving the overall well-being of AGYW. With added familial support and education about how to best combat the mental health challenges of adolescence, we hypothesize that multidimensional concepts of one's self (i.e., self-concept) may also improve over longer periods of time, and that the observed short-term improvements in self-esteem and hopelessness outcomes can be sustained [40]. Specifically, we believe improvements in family dynamics that are achieved through the cultivation of open and supportive communication during the MFG can persist over time while savings behaviors that are no longer incentivized may fade after trial cessation.

These results should be considered within the limitations of the trial. First, as these interventions are family-based specifically, and our sample was restricted to those in their first or second year of secondary school, results are not generalizable to all AGYW. We hypothesize that the YDA and YDA + MFG interventions would be (1) less efficacious among those living

within an institution (e.g., boarding school) as these individuals may not have access to the same family support systems through which the interventions are believed to function and (2) more efficacious among those living within a family but not currently enrolled in school as these individuals may be most vulnerable to poor psychosocial health but have appropriate familial support to benefit from the interventions. Second, the self-report nature of the psychosocial well-being measures lends itself to social desirability bias despite the overall high internal reliability of the measures in this and similar contexts—this is not a limitation peculiar to our study. Overall environmental changes, or personal experiences (e.g., stressful life events) experienced over the course of the follow-up period may also contribute to within-subject or between-subject variations. However, because of the randomized nature of the trial, it is unlikely these types of events or changes would have a meaningful effect on study outcomes overall. Finally, we were only able to assess the short-term effects of the interventions explored here. Longer-term follow-up may provide important insight into the functioning of these interventions in improving the well-being of AGYW over time. The randomized, longitudinal nature of this trial is the primary strength of the study. This design allows us to draw robust conclusions about the observed short-term relationships between the intervention and psychosocial outcomes. In addition, we are able to tease apart which intervention components may be most effective at addressing specific psychosocial problems among AGYW, a critical endeavor in appropriately targeting interventions for this population.

In conclusion, the findings of this work have important public health implications around improving the psychosocial health of in-school AGYW in resource-constrained settings, including those in sub-Saharan Africa broadly. We found evidence that suggests improving the economic and family situations of in-school AGYW can yield significant improvements in hopelessness and self-esteem in a relatively short period of time— 12 months. Given the distinct and myriad challenges faced by this group, the long-term effects of these interventions (i.e., effects beyond the intervention delivery period) should be assessed, and the viability of the interventions for out-of-school
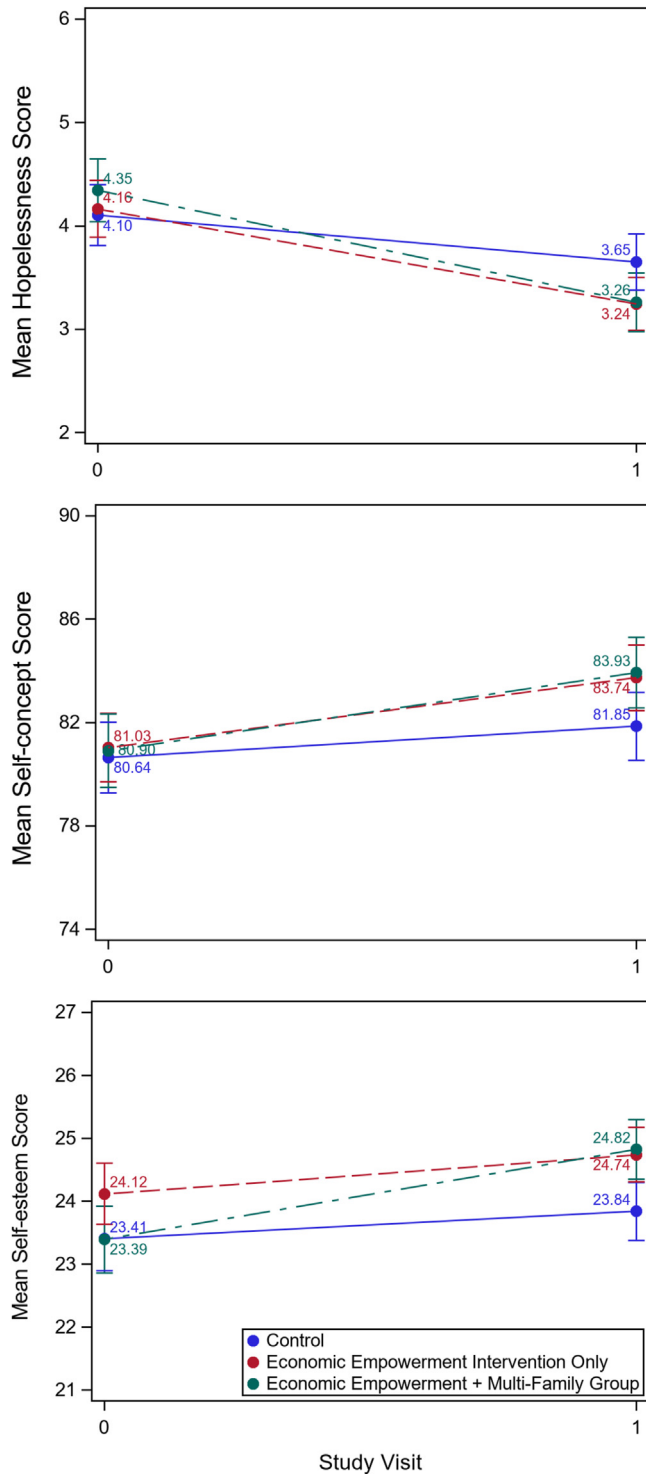
Figure 2. Mean psychosocial well-being scores over time, by study arm.

Table 3
Linear mixed model regression results estimated for the effect of the Suubi4Her intervention on hopelessness, self-concept, and self-esteem

	Hopelessness	Self-concept	Self-esteem
	β (95% CI)	β (95% CI)	β (95% CI)
No. of observations	2,479	2,479	2,437
Fixed effects			
Group (ref = BSOC)			
YDA	0.1 (−0.3, 0.5)	0.4 (−1.5, 2.3)	0.7 (0.0, 1.4)
YDA + MFG	0.2 (−0.2, 0.7)	0.3 (−1.7, 2.2)	0.0 (−0.8, 0.7)
Time (ref = baseline)	−0.5 (−0.8 to −0.1)	1.2 (−0.1, 2.5)	0.4 (−0.2, 1.0)
Group × time			
YDA × 12 months	−0.5 (−0.9, 0.0)	1.5 (−0.3, 3.3)	0.2 (−0.6, 1.0)
YDA + MFG × 12 months	−0.6 (−1.1, −0.1)	1.80 (−0.1, 3.7)	1.0 (0.2, 1.8)
Intercept	4.1 (3.8, 4.4)	80.6 (79.2, 82.1)	23.4 (22.9, 23.9)

BSOC = bolstered standard of care; CI = confidence interval; MFG = multiple family group; YDA = youth development account.

Supplementary Data

Supplementary data related to this article can be found at 10.1016/j.jadohealth.2022.11.250.

References

[1] Institute for Health Metrics and Evaluation (IHME). GBD compare data visualization, https://vizhub.healthdata.org/gbd-compare/. Accessed October 1, 2021.

[2] Solmi M, Radua J, Olivola M, et al. Age at onset of mental disorders worldwide: Large-scale meta-analysis of 192 epidemiological studies. Mol Psychiatry 2021;27:281–95.

[3] Zarrett N, Eccles J. The passage to adulthood: Challenges of late adolescence. New Dir Youth Dev 2006;13–28. 7.

[4] Ghafari M, Nadi T, Bahadivand-Chegini S, et al. Global prevalence of unmet need for mental health care among adolescents: A systematic review and meta-analysis. Arch Psychiatr Nurs 2021;36:1–6.

[5] Larsen A, Kinuthia J, Lagat H, et al. Depression and HIV risk behaviors among adolescent girls and young women seeking family planning services in Western Kenya. Int J STD AIDS 2020;31:652–64.

AGYW further explored. Moreover, policy-makers and program implementers should consider scale-up of the interventions in similar settings to bridge the mental health treatment gap for AGYW and minimize the long-term implications of adverse psychosocial health during adolescence.

[6] Davis EC, Rotheram-Borus MJ, Weichle TW, et al. Patterns of alcohol abuse, depression, and intimate partner violence among township mothers in South Africa over 5 years. AIDS Behav 2017;21:174—82.

[7] Kuringe E, Materu J, Nyato D, et al. Prevalence and correlates of depression and anxiety symptoms among out-of-school adolescent girls and young women in Tanzania: A cross-sectional study. PLoS One 2019;14:e0221053.

[8] Nabunya P, Damulira C, Byansi W, et al. Prevalence and correlates of depressive symptoms among high school adolescent girls in southern Uganda. BMC Public Health 2020;20:1—11.

[9] Peverill M, Dirks MA, Narvaja T, et al. Socioeconomic status and child psychopathology in the United States: A meta-analysis of population-based studies. Clin Psychol Rev 2021;83:101933.

[10] Sherraden M. Stakeholding: Notes on a theory of welfare based on assets. Soc Serv Rev 1990;64:580—601.

[11] Sherraden M. Assets and the poor: A new American welfare policy. New York: M.E. Sharpe; 2016.

[12] Zimmerman A, Garman E, Avendano-Pabon M, et al. The impact of cash transfers on mental health in children and young people in low-income and middle-income countries: A systematic review and meta-analysis. BMJ Glob Health 2021;6:4661.

[13] Kilburn K, Thirumurthy H, Halpern CT, et al. Effects of a large-scale unconditional cash transfer program on mental health outcomes of young people in Kenya. J Adolesc Health 2016;58:223—9.

[14] Cavazos-Rehg P, Byansi W, Xu C, et al. The impact of a family-based economic intervention on the mental health of HIV-infected adolescents in Uganda: Results from Suubi + Adherence. J Adolesc Health 2021;68:742—9.

[15] Ohrnberger J, Fichera E, Sutton M, et al. The effect of cash transfers on mental health-new evidence from South Africa. BMC Public Health 2020; 20:1—13.

[16] Ssewamala FM, Karimli L, Torsten N, et al. Applying a family-level economic strengthening intervention to improve education and health-related outcomes of school-going AIDS-orphaned children: Lessons from a randomized experiment in southern Uganda. Prev Sci 2016;17:134—43.

[17] Han CK, Ssewamala FM, Wang JSH. Family economic empowerment and mental health among AIDS-affected children living in AIDS-impacted communities: Evidence from a randomised evaluation in southwestern Uganda. J Epidemiol Community Health 2013;67:225—30.

[18] Byansi W, Ssewamala FM, Neilands TB, et al. The short-term impact of a combination intervention on depressive symptoms among school-going adolescent girls in southwestern Uganda: The Suubi4Her cluster randomized trial. J Adolesc Health 2022;71:301—7.

[19] McLeod JD, Shanahan MJ. Poverty, parenting, and children's mental health. Am Sociol Rev 1993;58:351.

[20] Mistry RS, Vandewater EA, Huston AC, et al. Economic well-being and children's social adjustment: The role of family process in an ethnically diverse low-income sample. Child Dev 2002;73:935—51.

[21] Martin MJ, Donnellan MB. Socioeconomic status, parenting investments, and negative personality traits over time and across generations. Dev Psychol 2021;57:164—79.

[22] Laird R, Kuhn E. Family support programs and adolescent mental health: Review of evidence. Adolesc Health Med Ther 2014;5:127.

[23] Bhana A, Kreniske P, Pather A, et al. Interventions to address the mental health of adolescents and young adults living with or affected by HIV: State of the evidence. J Int AIDS Soc 2021;24:e25713.

[24] Lynn CJ, Acri MC, Goldstein L, et al. Improving youth mental health through family-based prevention in family homeless shelters. Child Youth Serv Rev 2014;44:243—8.

[25] Gonzales NA, Dumka LE, Deardorff J, et al. Preventing poor mental health and school dropout of Mexican American adolescents following the transition to Junior high school. J Adolesc Res 2004;19:113—31.

[26] Gershoff ET, Aber JL, Raver CC, et al. Income is not enough: Incorporating material hardship into models of income associations with parenting and child development. Child Dev 2007;78:70—95.

[27] Kalil A, Ryan R. Parenting practices and socioeconomic gaps in childhood outcomes. Future Child 2020;30:29—54.

[28] Ssewamala FM, Bermudez LG, Neilands TB, et al. Suubi4Her: A study protocol to examine the impact and cost associated with a combination intervention to prevent HIV risk behavior and improve mental health functioning among adolescent girls in Uganda. BMC Public Health 2018;18:1—11.

[29] Zhang J, Li Z. The association between depression and suicide when hopelessness is controlled for. Compr Psychiatry 2013;54:790—6.

[30] Fathi-Ashtiani A, Ejei J, Khodapanahi MK, et al. Relationship between self-concept, self-esteem, anxiety, depression and academic achievement in adolescents. J Appl Sci 2007;7:955—1000.

[31] Ouma J, Jeffery C, Valadez JJ, et al. Combining national survey with facility-based HIV testing data to obtain more accurate estimate of HIV prevalence in districts in Uganda. BMC Public Health 2020;20:379.

[32] UNAIDS. Uganda | UNAIDS. UNAIDS: HIV and AIDS estimates 2019. https://www.unaids.org/en/regionscountries/countries/uganda. Accessed January 16, 2023.

[33] Beck AT, Weissman A, Lester D, et al. The measurement of pessimism: The hopelessness scale. J Consult Clin Psychol 1974;42:861—5.

[34] Kagotho N, Bowen NK, Ssewamala FM, et al. Cross-national validity of the Beck hopelessness scale for children and adolescents: Findings from the YouthSave-impact study Kenya. Int J Cult Ment Health 2018;11:457—69.

[35] Rosenberg M. Society and the adolescent self-image. New Jersey: Princeton University Press; 1965.

[36] Nöstlinger C, Bakeera-Kitaka S, Buyze J, et al. Factors influencing social self-disclosure among adolescents living with HIV in Eastern Africa. AIDS Care 2015;27:36—46.

[37] Fitts WH, Warren WL. Tennessee self-concept scale: 2nd edition (TSCS:2), vol. 7. California: Western Psychological Services; 1996.

[38] Ssewamala FM, Alicea S, Bannon WM, et al. A novel economic intervention to reduce HIV risks among school-going AIDS orphans in rural Uganda. J Adolesc Health 2008;42:102—4.

[39] Shrive FM, Stuart H, Quan H, et al. Dealing with missing data in a multi-question depression scale: A comparison of imputation methods. BMC Med Res Methodol 2006;6:57.

[40] Ran MS, Chan CLW, Ng SM, et al. The effectiveness of psychoeducational family intervention for patients with schizophrenia in a 14-year follow-up study in a Chinese rural area. Psychol Med 2015;45:2197—204.